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Can Zambia's copper become a flywheel for industrialisation?

ROSS HARVEY

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Abstract

Zambia is overly reliant on copper, and yet copper mining remains key to the country's future. The long-term prospects for copper are appealing, given its broad array of applications to modern technology. Current policy conditions for copper production and processing are, however, sub-optimal. This paper demonstrates the need for structural transformation in the Zambian economy. Given the imperative in both the Africa Mining Vision and Zambia's Seventh National Development Plan for mining to play a strong role in diversifying the economy, this paper evaluates the current obstacles to success and provides a tentative roadmap out of the commodity trap. It argues that islands of effectiveness that connect mining to other economic sectors must be identified and replicated if Zambia is to manoeuvre its way out of its debt conundrum. Structural barriers to transformation can be further overcome if macro-level policy is improved to incentivise long-term and broad-based growth over short-term gains, which will ultimately prove counter-productive.

Introduction

Three recent books advance the case that African states are typified by a disproportionate dependence on exporting high-bulk, low-value primary commodities and importing processed, high-value products.¹ It is not only that this produces negative terms of trade and keeps many African economies stuck in a commodity trap; the institutions that formally govern the extractive industries are often also incentive-incompatible with the distribution of political power. In other words, de jure institutions tend to fail if they are not supported by informal or de facto realities that support those institutions. Often, political elites are systemically involved in rent-seeking, and corruption appears to be strongly correlated with extractive industry activities. As a result, the commodity boom that accelerated at the turn of the century did not produce broad-based growth despite the optimism reflected in the 'Africa rising' narrative.²

The Africa Mining Vision (AMV) was produced in 2009 to move African economies away from these perpetual commodity price cycles unaccompanied by structural transformation. It sees structural transformation as essential to achieving what was then the Millennium Development Goals (now replaced by the Sustainable Development Goals). As the AMV highlights, 'the key issue, however, is in the formulation and implementation of workable industrialisation strategies based on our continent's unique strengths, rather than the emulation of strategies that may have been effective in other contexts'.³

1 Taylor I, 'Review essay: Understanding Africa's extractive sector', *South African Journal of International Affairs*, 26, 2, 2019.

2 *The Economist*, 'Africa rising', 3 December 2011, <https://www.economist.com/leaders/2011/12/03/africa-rising>, accessed 16 April 2019.

3 AU, 'Africa Mining Vision', February 2009, p.3, http://www.africaminingvision.org/amv_resources/AMV/Africa_Mining_Vision_English.pdf, accessed 16 April 2019.

This paper examines the case of Zambia, Africa's second-largest copper producer by volume.⁴ After a sub-optimal nationalisation experiment⁵ between 1968 and 2000, privatisation began in earnest when copper prices hit rock bottom.⁶ Since then, mines that were in constrained positions have been recapitalised and production and employment have recovered. However, input costs have also increased, and the tax regime has shifted on multiple occasions, making long-term planning difficult.⁷ Despite numerous plans, including the latest (Seventh) National Development Plan (7NDP),⁸ no serious moves have been made at a macro level to connect copper mining to the rest of the domestic economy or to the regional economy.

The paper begins with an overview of Zambia's current economic performance and structural challenges. The second section examines its general governance and policy performance in the context of its political settlement. The third section presents the theoretical importance of 'islands of effectiveness' in weakly institutionalised contexts. If successful models at the micro level can be replicated and scaled, then broad-based growth may become a reality instead of a sound bite. In the final section, a practical roadmap details clear, politically and fiscally feasible steps that the Zambian government, corporate sector and civil society can take to ensure that the country truly capitalises on its sub-soil wealth for future generations. This section shows how copper can become a flywheel for industrialisation in Zambia, one that will catalyse industrialisation and ignite structural transformation.

Zambia's economic performance

Zambia is on a precipice. The ratio of government debt to gross domestic product (GDP) is projected to rise to nearly 150% by 2020 and is currently around 70%. This indicator measures a country's ability to make future payments on its debt, which in turn affects its borrowing costs. To put this in context, Zambia's government debt was \$8.79 billion in 2017, whereas GDP was only \$25.81 billion.⁹ This does not imbue investors with confidence in Zambia's ability to sustainably service its external debt stocks, especially if the value of the currency depreciates. The government's efforts to attain liquidity – raising taxes without due diligence – have also been roundly criticised as being counter-productive for long-

4 US Geological Survey, 'Copper statistics and information', 2018, <https://minerals.usgs.gov/minerals/pubs/commodity/copper/mcs-2018-coppe.pdf>, accessed 16 April 2019.

5 Cunningham SJ, 'Nationalization and the Zambian Copper Mining Industry', unpublished PhD thesis, University of Edinburgh, 1985, <https://www.era.lib.ed.ac.uk/bitstream/1842/7503/1/370577.pdf>, accessed 14 August 2019.

6 Craig J, 'Evaluating privatisation in Zambia: A tale of two processes', *Review of African Political Economy*, 27, 85, 2000, pp. 357–66. 'the most successful in Africa' (Campbell White and Bhatia, 1998)

7 NRG (National Resource Governance Institute), *Ninth Time Lucky: Is Zambia's Mining Tax the Best Approach to an Uncertain Future?*, Briefing, October 2017, <https://resourcegovernance.org/sites/default/files/documents/ninth-time-lucky.pdf>, accessed 9 August 2019.

8 Zambia, Ministry of National Development Planning, 'Seventh National Development Plan 2017–2021', 2017, <http://extwprlegs1.fao.org/docs/pdf/zam170109.pdf>, accessed 9 August 2019.

9 PwC, 'Zambia's 2019 National Budget', 28 September 2018, <https://www.pwc.com/zm/en/assets/pdf/zambia-budget-2019.pdf>, accessed 14 August 2019.

term growth. In other words, while changes to the tax regime might increase short-term revenue, they may undermine the business rationale for production expansion, which shrinks the size of the tax base in the long run, resulting in lower future revenue. Such policy volatility also makes rating agencies nervous, as it suggests a lack of cohesive vision. In addition, negotiations with the International Monetary Fund (IMF) have failed, as the IMF is not persuaded that the Zambian government has made a credible commitment towards improving fiscal discipline.

Tax revenue as a proportion of GDP has been volatile, partly because of the country's dependence on mining, which shows fluctuating returns because of rapidly changing commodity prices. As a percentage of GDP, tax revenue was 15.2% in 2017, down from a high of 15.8% in 2014.¹⁰

From a trade perspective, Zambia's exports were worth a total of \$9.71 billion in 2017, of which copper accounted for 74% – 27% refined and 47% raw. Copper wire exports only totalled 0.86% of total exports, pointing to the dearth of manufacturing value addition in the economy. The next single biggest export is tobacco, which accounted for only 2% of total exports in 2017. It is difficult to imagine a starker picture of structural imbalance. Zambia's primary import – worth \$8.5 billion in 2017 – is copper ore, which it smelts, although its smelting capacity is currently not being optimised. (The third section of this paper deals with that challenge.) Next are cobalt oxides and hydroxides, followed by refined petroleum. A full 38% of Zambia's exports went to Switzerland in 2017, followed by China (15%) and India (9.5%).¹¹ Switzerland is not a major copper producer, which suggests that the majority of Zambia's copper is being sent to Switzerland to be traded. In other words, middlemen in the value chain appear to be earning the lion's share of value from Zambia's copper at the moment.

All high-value products such as machinery and vehicles are imported. South Africa is the origin of 31% of Zambia's imports, followed by the Democratic Republic of Congo (DRC) – copper ore for smelting and refining in Zambia – and China.

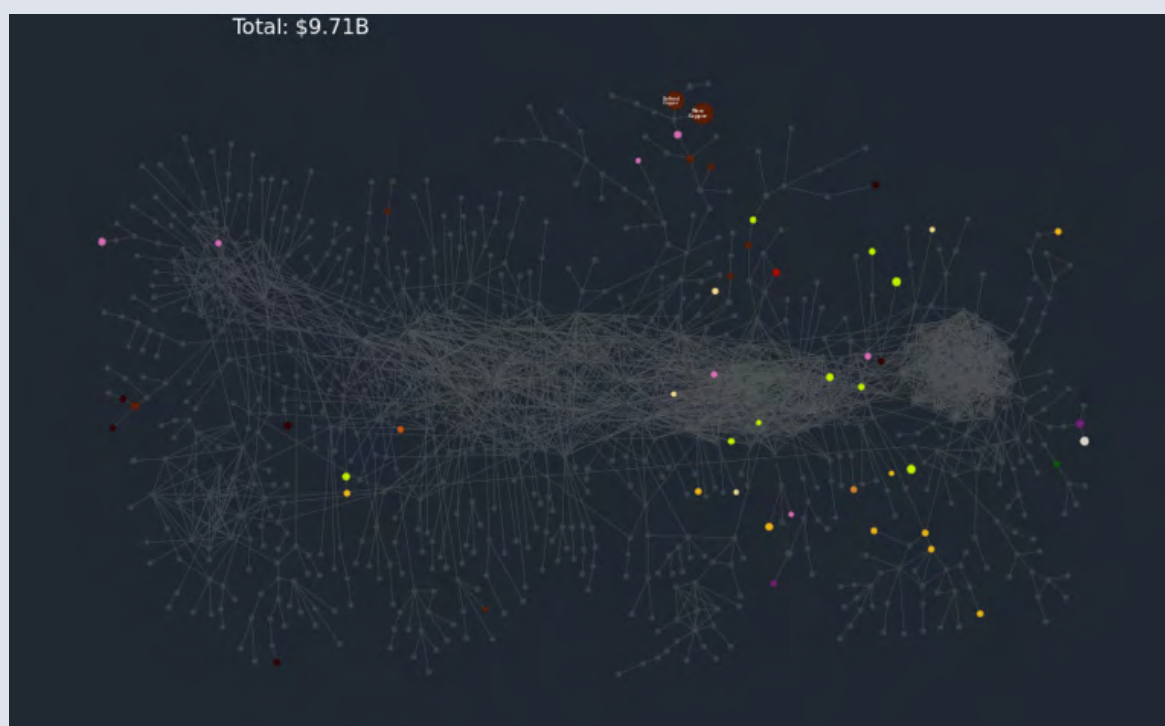
For this paper, the most important consideration is Zambia's relative lack of economic complexity. The Massachusetts Institute of Technology has constructed an Economic Complexity Index, in which the most economically complex countries are Switzerland and Japan, and the least (125th) complex is Papua New Guinea. Zambia scores a concerning -0.514, making it only the 78th most complex economy in the world. A critical concept in this analysis is 'product space' – a 'network connecting products that are likely to be co-exported and can be used to predict the evolution of a country's export structure'.¹²

10 World Bank, 'World Development Indicators', 14 August 2019, <https://databank.worldbank.org/source/world-development-indicators>, accessed 14 August 2019.

11 OEC (Observatory of Economic Complexity), 'Zambia', <https://atlas.media.mit.edu/en/profile/country/zmb/>, accessed 14 August 2019.

12 *Ibid.*

Figure 1 Zambia's economic complexity, 2017



Source: OEC (Observatory of Economic Complexity), 'Zambia', <https://atlas.media.mit.edu/en/profile/country/zmb/>, accessed 16 April 2019

One study shows that there is a systematic relationship between the number of different products that a country makes (diversification) and the number of other countries that, on average, also make those products (ubiquity).¹³ Countries are constrained in this respect by their capabilities. Those with greater capabilities are able to produce a wider range of products. If an economy lacks complexity, and inputs are specialised into only a few capabilities, diversification returns tend to be lower than they would be if inputs were fed into more capabilities. Complementarity of inputs is also reduced. For instance, mining requires a specialised set of non-tradeable inputs that – without a coherent industrialisation policy – are not easily shared as inputs to the production of other products. Figure 1 reflects the lack of closeness or complementarity of inputs in Zambia – products tend to be quite far from each other in the ‘product space’. Diversification is easier to accomplish if products are closer together on the complexity chart.

The absence of diversification and ubiquity leads to what Hausmann and Hidalgo call a ‘quiescence trap’ – ‘countries with too few capabilities will not have incentives to

¹³ Hausmann R & C Hidalgo, ‘Country Diversification, Product Ubiquity, and Economic Divergence’, HKS (Harvard Kennedy School) Working Paper, RWP10-045, November 2010, <https://doi.org/10.2139/ssrn.1724722>, accessed 9 August 2019.

accumulate additional capabilities, as these are unlikely to be demanded, given the absence of other complementary capabilities'.¹⁴

The policy implications of the Hausmann/Hidalgo model are complex, as the solution is not to simply generate more capability. Rather, it is to build sensible forward and backward linkages. A forward linkage would involve providing a capability that would promote the development of an additional product. This might entail something like creating the capability to produce iron mill-balls, an essential 'upstream' input for ore-crushing units on a copper mine. A backward linkage would be the demand for a new capability that emerges from attempting to make a new product that requires that capability. Here, one might consider a 'downstream' product such as copper cabling, which would require a range of specialised capabilities.

This quiescence trap coincides with another emerging trend in African countries – ie., 'premature deindustrialisation'.¹⁵ Industrialisation, historically, was the process by which developing and developed economies converged. Advanced economies have been deindustrialising for some time now, as evidenced by the declining employment share of manufacturing. Rising inequality is one consequence of this trend. Little recognised, however, is that most developing countries are also now deindustrialising.

Across Africa, those countries that had built up some level of manufacturing industries post-independence through import-substitution industrialisation policies are experiencing significant manufacturing shrinkage. This shrinkage is occurring at 'levels of income that are a fraction of those at which the advanced economies started to deindustrialize',¹⁶ and the transition to services is occurring far sooner along the development trajectory than historical norms would lead us to expect. The development concern is that the quality of the 'service' industry into which these countries are transitioning is relatively poor. In other words, while service industries are typically labour-absorptive, 'petty services' such as selling airtime – the type now typical of African urbanisation – do not generate sufficient employment opportunities to address the growing problem of youth unemployment. They also generate only meagre incomes, or what some have referred to as a poverty wage.

In the context of a growing youth population, fewer job prospects portend social upheaval. Additionally, an important source of productivity growth is in danger of being lost. One of the ways to escape the quiescence trap – Zambia's remaining stuck in its present structural economic form – would be through formal (or at least policy-planned) industrialisation, as it is normally a potent engine of growth. Manufacturing growth tends to lead to greater economy-wide productivity, which can produce a virtuous development cycle. If recent economic growth rates in sub-Saharan Africa are to be maintained, the relatively unanimous view among economists is that productive diversification and structural transformation are imperative.

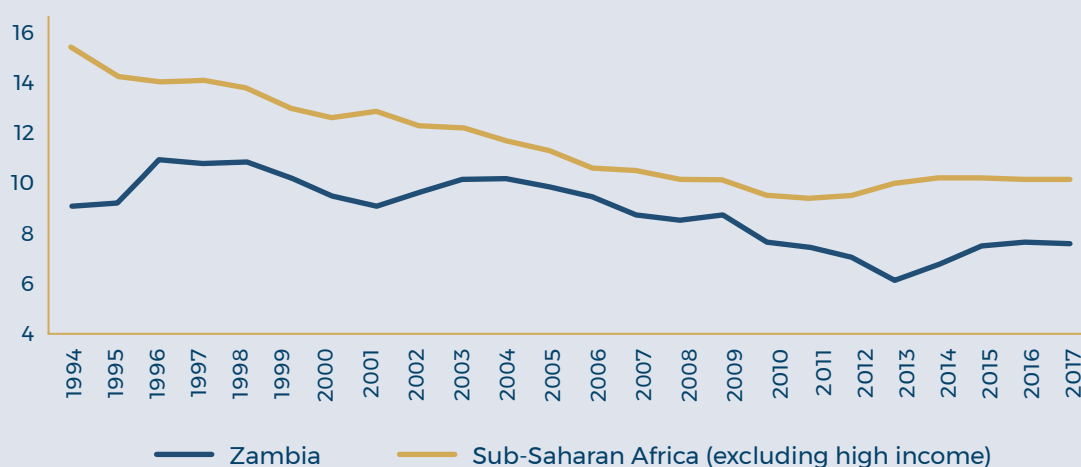
¹⁴ *Ibid.*, p. 2.

¹⁵ Rodrik D, 'Premature deindustrialization', *Journal of Economic Growth*, 21, 1, 2016, pp. 1-33.

¹⁶ *Ibid.*, p. 2.

As it currently stands, Rodrik's estimates – for three different measures of manufacturing – 'sub-Saharan African countries emerge as large losers on all three measures of industrialization'¹⁷ against their competitors. To make matters worse, resource booms tend to magnify the deindustrialising consequences of trade in primary products on countries with a comparative advantage in trading raw materials.¹⁸ This problem is intensified by the earlier observation that countries with lower initial capabilities tend to have lower product ubiquity. The commodity and quiescence traps tend, therefore, to be closely related.

Figure 2 Manufacturing, value added (% of GDP), Zambia vs sub-Saharan Africa



Source: World Bank, 'World Development Indicators: Manufacturing, value added (% of GDP)', <https://databank.worldbank.org/home.aspx>, accessed 23 April 2019

The rudimentary graph in Figure 2 demonstrates Rodrik's point. Sub-Saharan Africa's manufacturing value added¹⁹ has been declining, and Zambia underperforms even against that measure over the last 25 years despite relative improvement between 1994 and 1996. Zambia's manufacturing performance has declined as copper prices have improved. This is consistent with the phenomenon of Dutch disease, where appreciating currency values undermine the export competitiveness of other export sectors. Similarly, as Figure 3 shows, manufacturing exports as a percentage of total merchandise exports have been

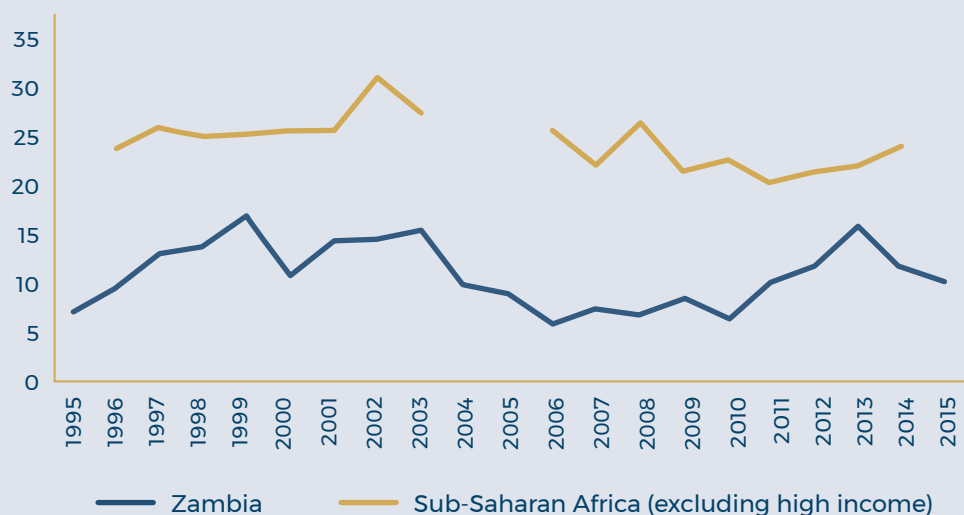
¹⁷ *Ibid.*, p. 16.

¹⁸ This is partly a 'Dutch disease' problem. The resources sector tends to draw capabilities away from manufacturing and other sectors; at the same time, increased demand for commodities drives up the exchange rate, which undermines the cost-competitiveness of other exports.

¹⁹ Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. See World Bank, 'World development indicators', *op. cit.*

significantly below the sub-Saharan African average for the last 25 years. The share was at its lowest during the commodity boom of 2001–2011.

Figure 3 Manufactures exports (% of merchandise exports), Zambia vs sub-Saharan Africa



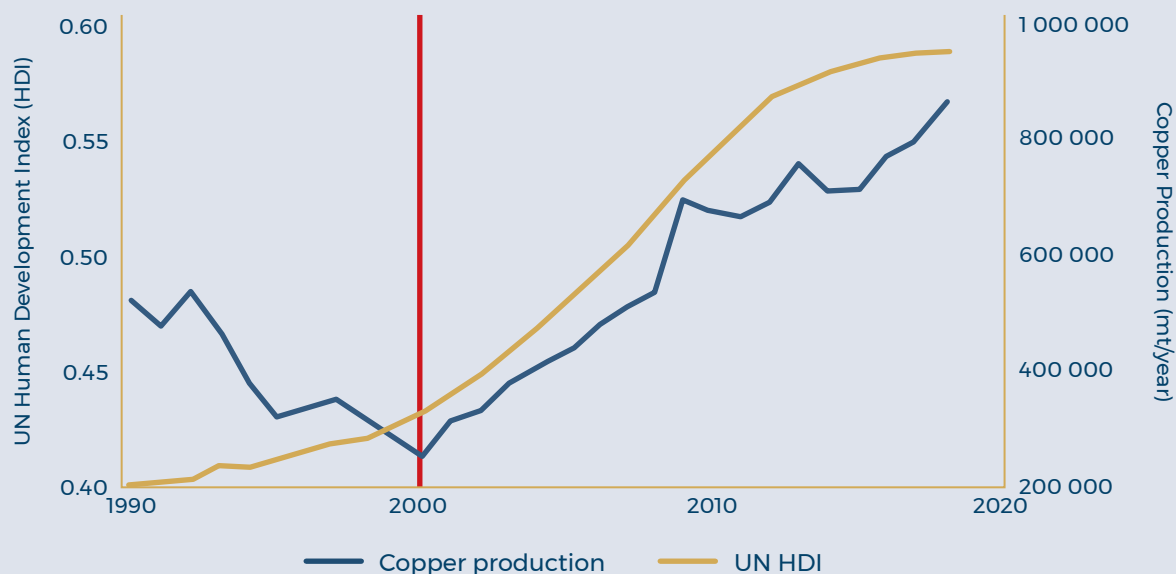
Source: World Bank, 'World Development Indicators: Manufactures exports (% of merchandise exports)', <https://databank.worldbank.org/home.aspx>, accessed 23 April 2019

This is not to argue that mining has somehow caused Zambia to perform poorly socio-economically. Figure 4 (page 9) demonstrates that since copper production has risen (even prior to the copper price itself recovering from its severe slump in the late 1990s), Zambia has seen radical improvements on important social indicators.

The UN built its Human Development Index (HDI) as a summary measure of average achievement in key dimensions of human development – longevity and health, possessing knowledge and standard of living. Figure 4 shows that, since Zambia's privatisation process concluded in 2000 (the vertical red referent line), and copper production recovered as a function of renewed investment *before* price improvements in 2004, its HDI score has improved rapidly. The advantage of the HDI is that it avoids purely economic measures of success such as GDP growth. In the words of the UN: '[P]eople and their capabilities should be the ultimate criteria for assessing the development of a country.'²⁰ Another critical socio-economic indicator is the proportion of 'working poor' (earning \$3.10 a day or less) to the total working population. As wealth grows in the economy, this should translate

20 UNDP (UN Development Programme), 'Human Development Index', <http://hdr.undp.org/en/content/human-development-index-hdi>, accessed 12 March 2019.

Figure 4 Copper production vs Human Development Index performance, 1990–2018



Source: Author compilation using data from US Geological Survey, 'Copper statistics and information', 2018, <https://minerals.usgs.gov/minerals/pubs/commodity/copper/mcs-2018-coppe.pdf>, accessed 16 April 2019; UNDP (UN Development Programme), 'Human Development Index', <http://hdr.undp.org/en/content/human-development-index-hdi>, accessed 16 April 2019

into a wealthier workforce and a greater distribution of benefit towards the lower-income quintiles. Figure 5 shows that this has indeed occurred in Zambia. As copper production started to recover, the proportion of the workforce that was poor peaked in around 2007. This is because wages, immediately post-privatisation, were relatively low, but grew as investment started to return and production started to improve.

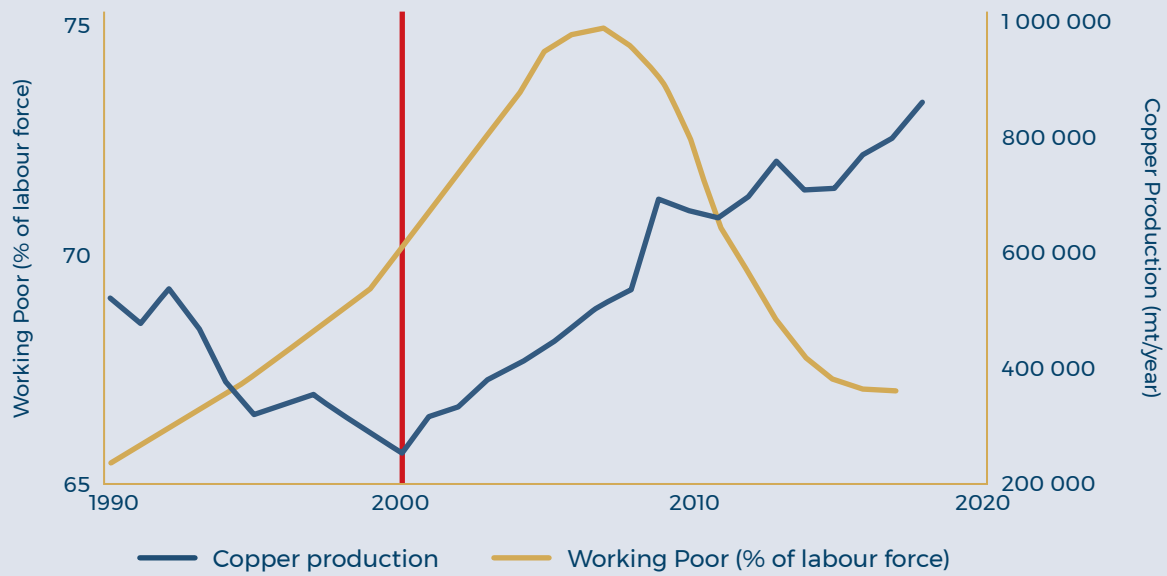
After the global financial crisis of 2008, where one might have expected to see an increase in the proportion of working poor, the percentage came down.²¹ In other words, there was a lag effect, but it was nonetheless robust to external shocks. The workforce grew wealthier after a sustained increase in copper production. This distribution of wealth towards the lower-income quintiles was relatively unaffected by the global financial crisis.

Sometimes commodity exports can serve as a buffer against international headwinds. Lag effects are critical for policymakers to comprehend, as it takes time for broad-based benefits to accrue. The lag is typically at odds with political time cycles that expect to see faster and larger benefits, which leads to policy changes at exactly the wrong point in the business cycle.

21 UNDP, 'Zambia Human Development Report 2016: Industrialisation and Human Development; Poverty Reduction through Wealth and Employment Creation', <https://www.undp.org/content/dam/zambia/docs/hdr%20reports/ZHDR%202016.pdf>, accessed 14 August 2019.

Correlation does not constitute causation. Nonetheless, correlations are difficult to ignore, and the above data suggests that – despite prolific condemnation of Zambia’s mining industry as having provided negligible benefit to the country – socio-economic benefits have followed the recovery of copper production since 2000.

Figure 5 Copper production vs proportion of working poor, 1990–2018



Source: Author compilation using data from US Geological Survey, 'Copper statistics and information', 2018, <https://minerals.usgs.gov/minerals/pubs/commodity/copper/mcs-2018-coppe.pdf>, accessed 16 April 2019; UNDP, 'Human Development Index', <http://hdr.undp.org/en/content/human-development-index-hdi>, accessed 16 April 2019

Thus far we have observed that mining-related Dutch disease might have undermined manufacturing in Zambia. Structural transformation is thus imperative. The country has nevertheless benefited from mining, especially in the wake of renewed investment in the sector after the heavy losses in the final days of nationalisation. The policy question is how Zambia can retain and expand the socio-economic benefits that accrue from mining. How can mining become a flywheel for industrialisation to ensure that the nation benefits more broadly from its copper resources? Ultimately, that is first a governance and then a policy

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question. If copper abundance in Zambia is to serve as a flywheel for industrialisation, for creating a virtuous cycle of forward and backward linkages, then governance performance must first be better understood and improved. Industrialisation policies and strategies are bound to fail in the context of a persistent weakly institutionalised, rent-seeking state.

Governance performance in the context of Zambia's political settlement

Auty, who coined the term 'resource curse', wrote in 2008 that 'a complacent Zambian government [in contrast to Botswana] deployed copper rent through a statist development strategy that within a decade fatally weakened the economy's resilience to economic shocks'.²² This refers to the United National Independent Party (UNIP) government prior to privatisation. A relative consensus has emerged in the 'resource curse' literature that identifies weak institutions as the primary variable that determines the nature of the relationship between natural resource wealth and (under)development. Auty argues that in low-income economies, institutions reflect political incentives rather than shape them. Commodity rents shape political incentives, disproportionately favouring politically connected insiders. Rent cycling theory²³ posits that high rents (normally windfall commodity revenue) tend to deflect governance incentives away from future wealth creation and towards distribution into patronage networks. This distorts the economy, hinders the building of institutions of accountability and prolongs the recovery periods that follow growth collapses.

Negative effects from this rent cycling are amplified in contexts of over-dependence on a single commodity and a command economy controlled by the state. His case study on Zambia illustrates this. By the onset of widespread nationalisation in 1968, Zambia was already mineral-dependent and struggling as copper slipped towards global oversupply. The state's well-intentioned efforts to boost national ownership of assets and to relieve urban unemployment eventually backfired, as unproductive jobs funded by copper rents could not be sustained when the mines started to incur productivity losses. Statist ideology posited that copper rents – taxes and dividends from owning the copper mines – would be used to promote competitive economic activity in other sectors that would be protected from external competition by the state. This protectionist policy failed. By the 1980s domestic resource costs of local consumer goods were three times competitive levels,²⁴ and thus unsustainable in the wake of declining mining productivity. According to Auty, UNIP 'maintained political support by extracting rent at the expense of competitiveness

22 Auty R, 'Political Economy of African Mineral Revenue Deployment: Angola, Botswana, Nigeria and Zambia Compared', Real Institute Elcano Working Paper, 28, 2008, http://www.realinstitutoelcano.org/wps/wcm/connect/688e22804f018a599c45fc3170baead1/WP28-2008_Auty_Political_Economy_African_Mineral_Revenue_Deployment.pdf?MOD=AJPERES&CACHEID=688e22804f018a599c45fc3170baead1, accessed 9 August 2019.

23 *Ibid.*

24 *Ibid.*

and blaming the consequent growth collapse on unfavourable external events',²⁵ including the collapse of global copper prices. Barton, in reflecting on Zambia's post-independence evolution, emphasises UNIP's 'purposeful and systematic reduction of institutional constraints on President Kaunda'²⁶ as the primary factor behind policy instability and the resultant drop in foreign direct investment. A removal of constraints on presidential power made Zambia's institutions more extractive and less inclusive.

Social responses to the resultant economic hardship eventually forced multiparty elections in 1992. UNIP was ejected and the Movement for Multi-Party Democracy (MMD) came into power. Auty notes that it took a decade after reforms began, and an internal change in MMD leadership, for the economic decline to reverse. The privatisation process of the late 1990s created rent-extraction opportunities by rigging asset sales to favour politically connected insiders. This undermined potential efficiency gains post-privatisation that could have generated greater levels of broad-based benefits. The post-2000 commodity boom raised fears that rent seeking would further reverse reform and embed corruption and patronage.

Hinfelaar and Achberger show that, 'because government revenue depends on fluctuating copper prices, campaign promises and public expectations for wealth accumulation were never fully met, leading to a disenchantment with political parties'.²⁷ They conclude that patron-client politics deepened in response to competitive pressures during the 1990s. This occurred predominantly through the distribution of agricultural subsidies and the brief introduction of a windfall tax on mining profits. Chiming with Barton's assessment, Hinfelaar and Achberger point to the importance of the way in which power was centralised in the presidency under Kaunda's tenure. The result is that political mobilisation has lacked a socially coherent basis since then, as power tends to be personalised rather than policy-orientated. For Zambia to propel its way out of the quiescence trap, the governance imperative is to move away from clientelism and towards a more programmatic approach to ensuring that mining is a flywheel for industrialisation rather than only a revenue source.²⁸

Under Frederick Chiluba, the leader of the MMD, large-scale privatisation began. The Mines and Minerals Act of 1995, instead of implementing a uniform tax regime and establishing a code of conditions for private operators, provided for development agreements (DAs) to be negotiated between each company and the state. Several state officials have since been convicted of corruption in their closed-door negotiations with some of the companies involved. In hindsight, the lack of transparency in these agreements has caused problems by giving rise to a perception of underhanded behaviour. State-investor relations have remained relatively toxic since then.

25 *Ibid.*, p. 8.

26 Barton SJ, 'Why Zambia failed', *Journal of Institutional Economics*, 11, 4, 6 November 2015, p. 818.

27 Hinfelaar M & J Achberger, 'The Politics of Natural Resource Extraction in Zambia', ESID (Effective States and Inclusive Development) Working Paper, 80, 2017, <https://www.effective-states.org>, accessed 9 August 2019.

28 *Ibid.*

When copper prices started to climb and Zambia was offered debt relief in the 2000s, the MMD defied the existing DAs and increased mining taxation in 2008. This is emblematic of the structural inadequacies in Zambia that have created political incentives for policy volatility. The political expectation tends to be that mining will deliver broad-based growth, but the fact that this requires, firstly, a long lead time, and secondly, the tax revenue to be wisely invested in growth-supporting human and physical capital, is often not appreciated. The sentiment among a number of key stakeholders interviewed for this research was that public expenditure has not produced the capabilities that Hausmann points to as necessary for escaping the quiescence trap. In other words, mineral revenues from taxation have not translated into growth-enhancing infrastructure investment. As a result of this dynamic, and in the face of declining copper prices in 2009, the government increased taxes again.

Reports of rampant corruption in the MMD eventually led to its electoral demise in 2011. Nonetheless, tax regime volatility became embedded and has proven resilient to changes in government – each successive government has made wholesale changes to mining tax policy that have been poorly timed and often out of sync with business cycles. For instance, in 2017 Manley wrote that ‘the government has already changed the tax regime three times in the last 12 months and nine times in the past 15 years’.²⁹ Some of these changes are detailed below.

When copper prices fell in 2011, then president Michael Sata’s government raised taxes in a bid to fund increased government expenditure. These changes were enacted in 2012, with the government imposing a higher royalty rate. In the interregnum between Sata’s death and Edgar Lungu’s coming to power in 2012, the capital depreciation allowance was tightened (in 2015), accompanied by a proposed dramatic increase in the mineral royalty tax (MRT) to 20% for opencast mines and 8% for underground mines. By the time Lungu came to power, this move was immediately reversed by the revenue authority under intense pressure from the mines. The government eventually settled for a rate of 9% for both types of mining. Manley calculates that this equated to an effective tax rate of 55% for the industry. Less than a year later, when the copper price dropped to \$4,000 per metric tonne, the cabinet approved yet another change to lower the effective rate to 44%.

Policy instability not only undermines investor confidence; it also affects efficient revenue collection. Zambia’s tax regime changes have followed price movements, but typically too long after the price change to benefit the nation. Ironically, this lag in policy response puts companies under too much pressure during downturns and generates insufficient revenue income during boom times. ‘A tax policy that is constantly seeking to catch up with events opens the door for these inefficiencies.’³⁰ In addition to the challenge of maximising tax revenue, the proceeds have too often been spent unproductively or disappeared through

29 NRCI, *op. cit.*

30 *Ibid.*, p. 6.

corruption. 'The consequence of this was that during an economic downturn, the consumptive nature of the state immediately gave rise to external and domestic debts.'³¹

Debt is not inherently problematic, but its sustainability depends on how credibly Zambia's creditors view the country's ability to service the debt in the long run. Zambia has three interrelated debt problems.³² The first is a growing fiscal deficit, now amounting to more than 8% of GDP (the total value of goods and services produced in the country in a single year). In other words, the government is spending more than it can afford, and this shows no sign of slowing down. The problem is exacerbated by a growing public sector wage bill that is unsupported by the productive tax base. This explains why the IMF will not – at present – consider a bailout for Zambia. The second problem is the sheer size and growth of external debt – the amount owed to creditors. In 2011, the external debt to GDP ratio was 20%. The debt is now worth at least \$10.05 billion in an economy worth only \$25 billion. In 2017 the country was only able to service \$815 million of the \$2.14 billion servicing cost it owed on the total debt amount of \$8.79 billion.³³ The outstanding debt-servicing amount alone was expected to grow to \$1.74 billion by the end of 2018.³⁴ The third major problem is that Zambia's debt is denominated in foreign currency, which means that the servicing costs rise exponentially every time there is a currency depreciation. In 2017 one in every six kwacha the government earned was spent on paying off the interest on its Eurobonds. These are due in 2022 and were the worst performing Eurobonds in the world in the first half of 2018.³⁵

Under this growing and intense pressure to service its debt without reducing consumption expenditure, the government again decided to alter the tax regime in 2018. The 2019 budget speech, delivered in September 2018, recognised that Zambia still faces a serious poverty challenge. Rapid economic growth has not been sufficiently inclusive. Finance Minister Margaret Mwanakatwe said the answer was to encourage the private sector to invest, innovate and create jobs. However, the specific measures proposed to raise revenue – many of which are now being implemented – will prove counter-productive.

The first and most destructive of these has been an across-the-board increase of 1.5 percentage points in MRT rates, in addition to a fourth tier of 8.5% when copper prices move above \$7,500/tonne and then a fifth tier of 10% at above \$9,000/tonne. Table 1 depicts Zambia's previous 'sliding-scale' MRT regime (enacted in 2016) alongside the most recent changes. This sliding-scale approach is novel and – some interviewees contend – ill advised, given the volatility in the copper price. Mines can make large profits when the prices are high but bleed when they plummet.

31 Hinfelaar M & J Achberger, *op. cit.*

32 For a thorough but readable explanation of Zambia's debt problem, see Mining for Zambia, 'What is, and what could be: Zambia's escalating debt problem and what to do about it', 26 September 2018, <https://miningforzambia.com/zambias-escalating-debt-problem/>, accessed 12 June 2019.

33 Mfula C, 'Zambia external debt rose to over \$10 billion at the end of 2018: Finance minister', *Reuters*, 11 March 2019, <https://af.reuters.com/article/investingNews/idAFKCNILF14X-OZABS>, accessed 14 August 2019.

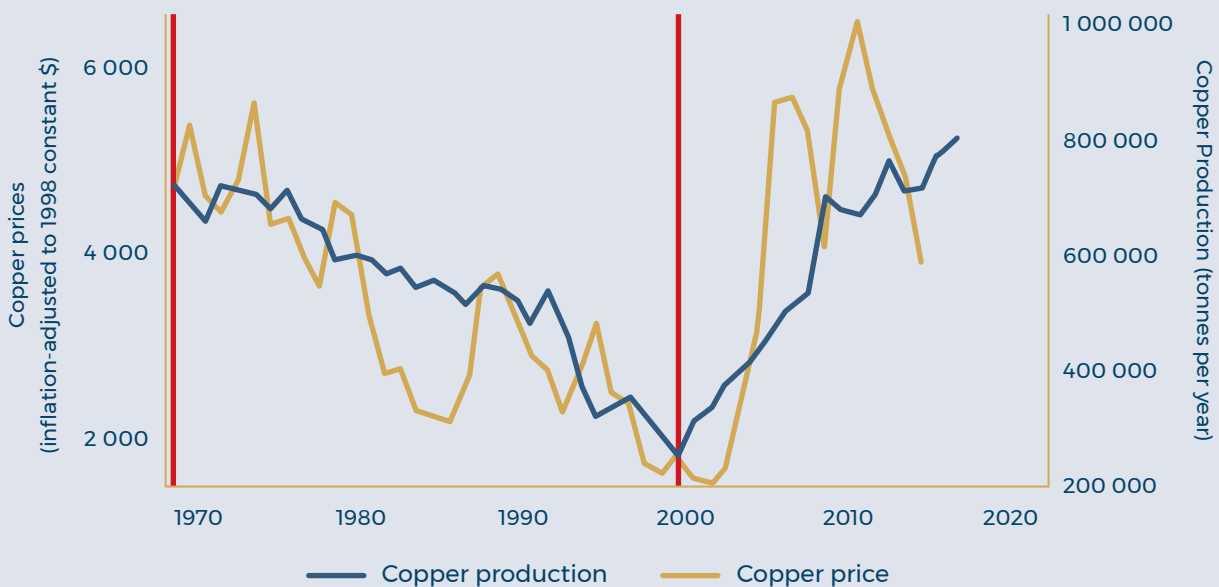
34 Mining for Zambia, 26 September 2018, *op. cit.*

35 *Ibid.*

| TABLE 1 ZAMBIA'S MRT REGIME, PAST AND PRESENT | | |
|---|---------|---------|
| Copper price | Old MRT | New MRT |
| Below \$4,500/tonne | 4% | 5.5% |
| Between \$4,500 & \$6,000/tonne | 5% | 6.5% |
| Above \$6,000/tonne | 6% | 7.5% |
| Above \$7,500/tonne | - | 8.5% |
| Above \$9,000/tonne | - | 10.0% |

Source: Author compilation derived partly from Manley D, 'Ninth Time Lucky: Is Zambia's Mining Tax the Best Approach to an Uncertain Future?', Natural Resource Governance Institute, 2017, <https://resourcegovernance.org/sites/default/files/documents/ninth-time-lucky.pdf>, accessed 14 August 2019

Figure 6 **Zambian copper production vs global copper price, 1969–2018**

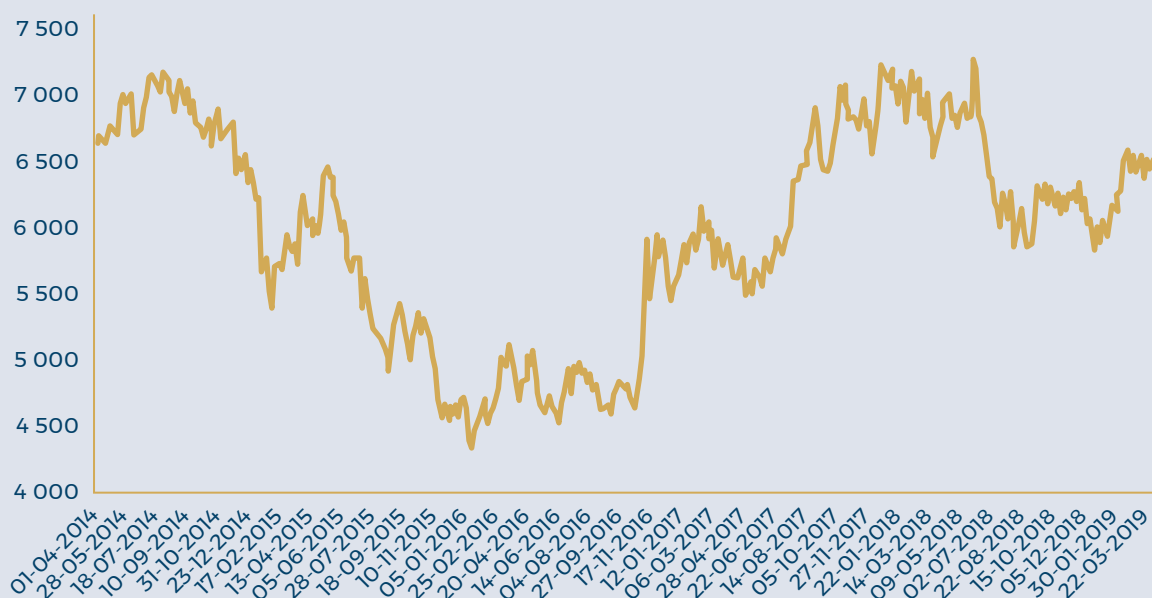


Source: Author compilation; data from US Geological Survey, 'Copper statistics and information', 2018, <https://minerals.usgs.gov/minerals/pubs/commodity/copper/mcs-2018-coppe.pdf>; accessed 16 April 2019; UNDP, 'Human Development Index', <http://hdr.undp.org/en/content/human-development-index-hdi>, accessed 16 April 2019

Figure 6 shows the movement of Zambia's copper production and global copper prices over the last 50 years. The global copper price is clearly volatile, making mine planning challenging at the best of times. A 1.5 percentage point increase on MRT of 5% amounts to an effective increase of 30%. In other words, mining companies will be paying 30% more MRT on revenue when the copper price is between \$4,500 and \$6,000/tonne. The London Metal Exchange, which the Zambian government uses to set MRT, shows that in 2019 alone copper prices have climbed from around \$5,800/tonne in early January to just above \$6,400/tonne in April and back down to \$5,876 in June (nearing the lower end of its

year-long range since July 2018). Figure 7 shows the volatility over the last five years in higher resolution.

Figure 7 London Metal Exchange copper price, April 2014 to April 2019



Source: LME (London Metal Exchange), 'LME copper', <https://www.lme.com/en-GB/Metals/Non-ferrous/Copper#tabIndex=2>, accessed 24 April 2019

Production is already sensitive to changes in the copper price, and typically plummets when tax changes are announced. As one investment expert interviewed for this paper said: 'Instability is worse than bad news, especially for miners.'³⁶ Figures from within Zambia's mining industry suggest that had the taxation regime remained stable from 2012 onwards, production could have reached 1.099 million tonnes by 2018.³⁷ Instead, it only reached 861 946 tonnes that year.³⁸ On these calculations, the MRT revenue intake could have been \$472 million instead of \$340 million – effectively a \$132 million loss to the government as a direct result of its constantly changing MRT. Eradicating tax regime volatility, all else being equal, will lead to increased production. Even at relatively low royalty rates, this will likely result in greater tax revenue in the short, medium and long term rather than imposing higher tax rates now. In other words, the advice from investors is for governments to set optimal long-term tax policy and to then commit to leaving those rates unchanged for a specified (and preferably long) period. Sliding scales are not advisable.

36 Personal interview conducted under the Chatham House Rule, Cape Town, 18 April 2019.

37 Personal communication with mining executive via email; confidential information.

38 Musukwa R, 'Mining minister: "Zambia is open for business"', *Mail & Guardian*, 7 February 2019, <https://mg.co.za/article/2019-02-07-00-mining-minister-zambia-is-open-for-business>, accessed 14 August 2019.

Eradicating tax regime volatility, all else being equal, will lead to increased production

Further exacerbating the MRT instability, the government has insisted that MRT will no longer be tax-deductible for income purposes, a unique development among similar countries. It is a high-powered investment disincentive. Corporate income tax will be paid on gross revenue regardless of MRT contributions. As it is, the government owes VAT rebates to the mining industry worth approximately \$1.5 billion (plus another \$500 million to the mine support industry).³⁹ It claims that the industry owes it at least \$600 million in return if one included penalties and interest (although for what remains unclear).⁴⁰ Moreover, the government has proposed a reversion away from the VAT system altogether to a non-refundable Government Sales Tax.⁴¹ This was due to be implemented on 1 July 2019 over and above the 7% threshold that would equate to current VAT revenue, but the uncertainty surrounding these policies is retarding growth in the mining industry and beyond.⁴²

How then does Zambia manoeuvre out of its volatile 'tax and spend' propensity? It has to broaden the tax base through economic diversification to avoid all of its fragile eggs sitting in one basket. But mining has to be the flywheel for that diversification, as global copper shortages are looming, and Zambia should capitalise on this in a more stable policy environment.

To get the flywheel moving and establish forward linkages from mining, a number of prerequisites need to be in place. Inputs need to be inexpensively available, as both the fixed and operating costs of manufacturing tend to be high. As indicated in the previous section, Zambia has failed to maximise its linkages to the mining sector. This is especially true downstream. The AMV emphasises 'downstream linkages into mineral beneficiation and manufacturing' and Zambia's own 7NDP aims to⁴³

create a diversified and resilient economy for sustained growth and socio-economic transformation ... [and will] promote the establishment of multi-facility economic zones and industrial parks across different sectors to bridge the infrastructure gap and at the same time promote value addition to raw materials.

39 Personal interview conducted under the Chatham House Rule, Kalumbila, 28 March 2019.

40 Reuters, 'Zambia says audit shows mining firms in arrears to government', 4 January 2019, <https://af.reuters.com/article/investing/News/idAFKCNIOYOLE-OZABS>, accessed 26 April 2019.

41 Mining for Zambia, 'Zambia is taxing its way out of short-term pain and into long-term injury', 4 October 2018, <https://miningforzambia.com/zambia-taxing-way-short-term-pain-long-term-injury/>, accessed 26 April 2019.

42 Hill M, 'Why a tax crusade in Zambia worries copper miners', *Bloomberg*, 10 June 2019, <https://www.bloomberg.com/news/articles/2019-06-10/why-a-tax-crusade-in-zambia-worries-copper-miners-quicktake>, accessed 12 June 2019.

43 Zambia, Ministry of National Development, *op. cit.*

Zambia has failed to maximise its linkages to the mining sector

One thing Zambia does possess, however, is smelting capacity. Smelters transform raw copper into refined copper anodes. Zambia has capacity to smelt at least 1.2 million tonnes of copper a year, with four facilities. In 2018 it only produced 582 000 tonnes. Under-utilisation is poor business, as the asset value of a plant depreciates at the same rate regardless of throughput. Idling smelters undermine the business case for the future expansion of productive capacity. With copper prices set to increase in the long run, a low-hanging fruit would be for the Zambian government to do everything in its power to incentivise increased production and ensure that current smelting capacity is fully utilised (and ultimately expanded).

Over and above the VAT and MRT changes announced in the 2019 budget speech, however, an amendment to the new tax bill was introduced shortly before the new year commenced, and only circulated to affected parties the day before it came into force. This amendment was the imposition of a 5% concentrate import tax. This had the immediate effect of Konkola Copper Mines (KCM) announcing that it would shut its Nchanga and Chambishi smelters.⁴⁴

For Zambia's smelters to operate at full capacity, they need reliable, well-priced electricity, a competitive transport and refining levy, and easily available copper concentrate. This volume of concentrate is not always available within Zambia itself, partly because mining production levels are approximately 20% lower than they would have been in the presence of a stable tax regime. To supplement smelter input, Zambia typically imports inexpensive concentrate from the DRC. This is critical to ensuring that existing smelting capacity is fully utilised. However, the DRC is now likely to divert its concentrate ore elsewhere, as it is economically unfeasible for Zambian importers to pay 5% more overnight for importing DRC (and other) concentrate. KCM stated the problem this way: 'The new import duty has an impact on every tonne of copper produced resulting from imported concentrates. The current margins are thin and completely eroded through this impact, resulting in high production costs and operational losses.'⁴⁵

In an effort to compensate for the imposed import duty, the government has 'reduce[d] the company income tax rate to fifteen percent from thirty-five percent for companies that add

44 Radford C, 'ERG suspends copper, cobalt production at Chambishi', *Metal Bulletin*, 14 February 2019, <https://www.metalbulletin.com/Article/3858286/ERG-suspends-copper-cobalt-production-at-Chambishi.html>, accessed 12 June 2019.

45 *Lusaka Times*, 'Tax war with mines: KCM moves to cut operations due to new government tax regime', 5 January 2019, <https://www.lusakatimes.com/2019/01/05/tax-wars-wars-with-mines-kcm-moves-to-cut-operations-due-to-new-government-tax-regime/>, accessed 26 April 2019.

value to copper cathodes'.⁴⁶ But this fails to address the increased cost burden of smelters that are adding value to concentrate ore to produce anodes. It also fails to recognise that companies seeking vertical integration of production and smelting no longer have an incentive to invest in the country. They would be better served by establishing themselves elsewhere (with less expensive and more reliable electricity) and importing Zambian concentrate.

The above analysis raises the obvious question of what can feasibly be done to reverse the current trajectory and move Zambia onto a development pathway that reflects the ambition of the AMV and the country's own 7NDP. A useful lens through which to answer the question is provided by the concept of 'islands of effectiveness'.⁴⁷

Islands of effectiveness

In governance contexts that are characterised by 'a difficult combination of seeming openness, weak institutions and strong inter-elite contestation for power and resources', Levy argues that relatively modest reforms that alleviate binding constraints at the macro-level can unlock growth. What can drive progress in these settings are islands of effectiveness – 'narrowly focused initiatives that combine high-quality institutional arrangements at the micro-level, plus (as necessary) narrowly-targeted policy reforms that facilitate the emergence and operation of these islands'.⁴⁸ The point is for local-level partnerships that connect influential political actors with private investors to provide the credible commitment that private sector actors require to invest even during volatile times. Drawing on the profound contribution to the development literature made by Ostrom, Levy delineates eight principles for collaborative governance to be effective at the local level:

- players in the focused initiative all understand the boundaries between legitimate participants and non-participants;
- the majority of individuals affected by the initiative are empowered to participate in formulating and modifying the rules of engagement;
- rules are specified up front regarding the distribution of benefit to participants, which must be proportional to the distribution of labour, material and other costs;
- monitoring of participants is crucial, although these monitors must be functionally accountable to the participants (or are also participants themselves) – ie, they must have skin in the game;

46 Mining for Zambia, 'Swimming downstream: Zambia's potential for copper beneficiation', 11 January 2019, <https://miningforzambia.com/swimming-downstream-zambias-potential-for-copper-beneficiation/>, accessed 14 August 2019.

47 Levy B, 'Can Islands of Effectiveness Thrive in Difficult Governance Settings? The Political Economy of Local-Level Collaborative Governance', World Bank Policy Research Working Paper, 5842, 2011, <https://openknowledge.worldbank.org/handle/10986/3608>, accessed 9 August 2019.

48 *Ibid.*, p. 5.

- conflict resolution at the local level must be swift, built on pre-existing institutions;
- sanctions against those who violate the rules must be graduated, beginning with minimal consequences but becoming increasingly stronger with each subsequent violation;
- the government needs to recognise the right of local-level participants to set the rules for the initiative and participate in that process; and
- local-level decision-making, while connected to higher levels, is also clearly defined with its own autonomy.

In Levy's model, these principles are not divorced from broader political economy realities. He recognises, for instance, that every collaborative initiative may be subject to predation – the act of extracting rents with impunity by violating the rules required for that initiative to succeed. Nonetheless, armed with awareness of potential predation, those committed to the success of the initiative, with skin in the game, can resist such predation through drawing on their resources external to the action situation to facilitate rule compliance. For instance, they could draw on the commitment of powerful players/investors that are not easily dismissed or co-opted by the predatory network. If these productivity-enhancing networks have enough resources to overcome predation, an island of effectiveness may be formed that can be replicated elsewhere.⁴⁹

The next section details a roadmap for Zambia that draws on an empirical example of an existing island of effectiveness at the local level. It moves from the local level to increasingly higher-level reforms that would serve the country's quest for industrialisation.

A roadmap for industrialisation

To avoid mining being a hole in the ground that epitomises short-term extraction over long-term sustainability, closure plans and the generation of economic activity that extends beyond the life of mine are critical. In other words, mining – on a micro and macro level – needs to operate as a flywheel that generates sustainable economic activity ultimately independent of mining itself. To build and replicate islands of effectiveness, it

To build and replicate islands of effectiveness, it would be ideal for the macro-level policy framework to incentivise long-term development investment over short-term extraction

⁴⁹ *Ibid.*, p. 20.

would be ideal for the macro-level policy framework to incentivise long-term development investment over short-term extraction.

Mining is a fundamentally finite activity. The resource is exhaustible and becomes increasingly costly to extract over time. A number of interviewees for this paper, for instance, emphasised that a volatile tax regime reduces the life of any given mine.⁵⁰ Typically, a mine plan would operate according to a number of assumptions – expected ore grade over time; future demand fundamentals for the mineral or metal, which influences price expectations; input cost expectations such as labour, new technology, electricity, machinery, maintenance and taxes; and risks such as expropriation or policy changes. One mining executive emphasised that the mining industry itself has done a poor job of communicating the costs associated with producing copper anode, especially from low-grade ore bodies, which are the likely global future of copper mining. Each tonne of copper that leaves the mine represents all the above-mentioned costs. For every tonne of copper recovered from an ore body of 0.5% copper grade, roughly 600 tonnes of ore have to be mined and processed.⁵¹

Profit, if any, is produced after recapitalisation and other finance and production costs are accounted for, is often relatively small (if made at all – few of Zambia’s mines are currently profitable). But without profit, or the long-term promise thereof, shareholders will not invest more money in the venture. Therefore, if MRT changes, for instance, pushing up the effective tax rate significantly, the economic calculus is to mine the existing ore body in a way that allows for increased short-term production at the expense of access to future ore. This is value-destructive on at least four levels for the country concerned.

First, it reduces employment over time. Mines are typically not mass providers of direct employment, and yet mining jobs pay relatively well and each mining job supports upward of 10 dependents on average in some contexts.⁵² Because mining generates demand for support industries, it also creates indirect employment, part of what economists call the ‘multiplier effect’. These support industries have a higher chance of long-term success if mines generate employment growth over as long a period as the ore body and new technology could possibly allow. In a context of high levels of poverty and joblessness, this is critical. Miners’ wages, one interviewee suggested, were roughly \$100/month in the late 1990s.⁵³ Since recapitalisation and increased production, those wages have risen to the point where an average mine operator now earns approximately \$1,500/month. That explains

50 Personal interviews with mining executives conducted under the Chatham House Rule, Lusaka, Solwezi and Kalumbila, 25-29 March 2019. One interviewee went so far as to say that even if the government reverted back to the stable policy and tax regime that had existed when Lumwana, Sentinel and Kansanshi mines were built 10 years ago, it would not change the dynamics, as the credibility required to attract more investment is now absent. One suggestion proposed was for a large IMF bailout with severe conditionalities to ensure fiscal discipline and credible long-term debt servicing. Only then would investment – on the scale required – return.

51 Personal interview conducted under the Chatham House Rule, Kalumbila, 28 March 2019.

52 Minerals Council South Africa, ‘Facts and Figures 2018’, <https://www.mineralscouncil.org.za/industry-news/publications/facts-and-figures>, accessed 12 June 2019.

53 Personal interview conducted under the Chatham House Rule, Kalumbila, 28 March 2019.

the earlier graph depicting the rapid decline in the proportion of ‘working poor’ among Zambians. As another executive put it:⁵⁴

When I arrived in Solwezi, the people were thin, stick-thin and basically starving; now, they look healthy – there is a glow in their skin, their children are in schools, clinics offer real healthcare and mining is evidently benefiting the local communities in which they operate.

Second, exploration investment is curtailed or stopped. Investment decisions are made under a set of conditions that investors reasonably expect will not change dramatically or often. Exploration is the lifeblood of the mining industry. Without it, the industry cannot expand. This is a particularly important point for copper, as global future demand will balloon as the supply deficit grows and high-grade discoveries become increasingly less likely. At the height of the copper boom a decade ago, exploration expenditure in Zambia neared \$100 million per year, whereas by 2018 it was estimated to be only between \$10 million and \$20 million a year. Current reserves will keep Zambian copper inventories stocked for approximately 20 more years. Beyond that, a sudden drop is projected, as the probability of exploration success is extremely low – finding deposits that are economically feasible to mine average about 0.3% of targets explored. From identifying a viable ore body to actually starting the mine involves a ramp-up period of anywhere between 10 to 15 years. With only about five drill rigs in operation in Zambia at present, the lack of exploration investment is concerning for ensuring consistent inventory availability.⁵⁵

Third, the dividends that would otherwise have accrued to the government through its shareholding in certain mining operations (through ZCCM Investment Holdings) are essentially foregone. Moreover, because production is unlikely to grow under a volatile tax regime with other rising input costs, the overall tax revenue accruing to the state will – counter-intuitively – be less than under lower but more consistent rates. This is consistent across empirical studies in economics of a hypothesised phenomenon known as the Laffer Curve, where overall tax revenues start to decline beyond a threshold taxation level.⁵⁶

Fourth, a mine that is incentivised to take a short-term approach, cutting the life of the mine through increasing current rates of extraction, has no incentive to actively invest in upstream, side-stream and downstream linkages to its operations. This is the most pernicious effect, as it inflames the narrative that mining is only extractive and contributes insufficiently to national welfare. It also directly undermines the AMV and Zambia’s 7NDP. It is not that mining should subsidise any of these activities per se, especially if they are not viable in the long run. Yet, it does serve mining companies well to contribute to the welfare and sustainability of the communities in which they operate. It makes business sense

54 Personal interview conducted under the Chatham House Rule, Solwezi, 27 March 2019.

55 The data on exploration investment and the current state of exploration in Zambia comes from Mining for Zambia, ‘Exploration – the future of Zambian mining’, 29 November 2018, <https://miningforzambia.com/exploration-future-zambian-mining/>, accessed 8 May 2019.

56 Tilton JE & WJ Coulter, ‘Determining the optimal tax on mining’, *Natural Resources Forum*, 28, 2, 2004, pp. 144–49.

to procure as much as possible from as close to mine sites as possible when purchase costs are reasonable. Moreover, shareholders increasingly expect that this will be the case. Governments and the private sector can work together to create hubs of innovation and industry that can be replicated elsewhere and at scale.

Replicate ‘islands of effectiveness’

In respect of the last point, Zambia does boast an ‘island of effectiveness’ that offers an example of the route out of the resource curse and into industrialisation. Slightly over a decade ago, Zambian copper production was only 400 000 tonnes per year. It is now more than double that. This is due to the creation of three new mines – Lumwana, Kansanshi and Sentinel – in North-Western Province, colloquially referred to as the ‘New Copperbelt’. A total investment of \$7 billion was made in mines whose copper grade was low – 0.5% compared to 3% in the old Copperbelt – and with no pre-existing supportive mine infrastructure. Investors deemed the risk worth incurring because of the stable policy regime at the time. Investment in Sentinel alone came to \$2.1 billion. The resultant rapid growth was concomitant with an influx of jobseekers into remote areas. Solwezi witnessed a boom that placed significant pressure on public services. To prevent these challenges from multiplying, First Quantum Minerals (FQM) established the town of Kalumbila – to support its new Sentinel Mine – with a vision that stands as a useful example to companies and policymakers everywhere of what is possible when investment is purposefully linked to development.

Part of the vision was to position the town – geographically – outside the mine licensing area to avoid the typical trajectories of mining towns becoming ghost towns.⁵⁷ It is owned by the Town Development Corporation, a separate company, rather than by the mine itself. Mining towns in the past were designed as private entities serving only the purposes associated with the mine itself. Houses were mine property, as were schools, clinics, parks and other amenities. This meant that once the ore body was exhausted, the towns would invariably have no future. In some exceptional cases, where mines were close enough to large cities (such as Cullinan near Pretoria), mine property was sold off and converted to individual title. But Kalumbila was designed to attract people and businesses that would outlast the mine, even in this remote corner of Zambia near the DRC border. The initial investment of \$200 million has paid dividends. In the centre of the town, Choppies – a supermarket chain – boasts the highest-grossing revenue of all Choppies stores in Zambia per square metre.⁵⁸ Nonetheless, retail development has been slower than the town management would have liked.

57 This researcher grew up in mining towns across Southern Africa. Many weekends were spent visiting the Namibian ghost towns of Bogenfels, Pomona and Kolmanskop. That these are now tourist attractions is largely incidental, attributable to Luderitz having become a viable town independent of the nearby mines, and Oranjemund still producing diamonds to this day.

58 Personal interview conducted under the Chatham House Rule, Kalumbila, 29 March 2019.

Connected to the town is an industrial zone, which is attractive to investors not only because of favourable tax incentives but also because of the growth potential inherent in being close to three mines and the DRC and Angola borders. Export markets are increasingly important in an African context that is attempting to establish an internal free trade area. Intra-regional trade has always been recognised as critical to realising countries' growth potential, and Kalumbila is well positioned to provide an example of what the future could hold. The industrial zone already has a multimillion-dollar mill-ball plant, which produces high quality iron mill-balls for use in the mining production process. On the Sentinel mine property itself a sawmill worth \$2 million was developed, which produces furniture from the sustainably harvested forest that the mine preserved. The sawmill employs 120 people.

While most mines in the world are being criticised for destroying the environment, Sentinel has developed the non-mining areas of its current licence into a conservation wilderness that will be the foundation of a tourism industry once the copper has been exhausted. The copper ore from the mine is transported 150km away to the Kansanshi smelter near Solwezi, a state-of-the-art plant worth \$900 million, which operates at a scale and efficiency that rivals the world's best. The all-in costs of transforming copper ore (copper concentrate – about 26% copper) on arrival at the plant to 99% anode by the time the process is complete are about \$4/tonne, and the smelter treats about 28 000 tonnes of copper ore a month.⁵⁹

These are classic examples of upstream (mill-ball), side-stream (furniture) and downstream (smelting) linkages developed through the careful logic of appropriately structured incentives and long-term thinking. Between them, they constitute an island of effectiveness that can be replicated across the country, provided the right conditions are created. Foremost among these are property rights, discussed in the next section.

The good news is that the planned multi-facility economic zone at Kalumbila has buy-in and at least verbal support from the Minister of Commerce and the Commissioner of Lands.⁶⁰ Ultimately, as Levy points out, the success of islands of effectiveness depends on the productivity-enhancing networks being able to crowd out or at least keep at bay the predatory networks. If there is a strong coalition of producers among the mines, civil society and elements of the government, then islands of effectiveness such as Kalumbila will thrive and could be replicated elsewhere.

59 Mining for Zambia, 'Zambia's advanced, world-class smelter', 20 April 2017, <https://miningforzambia.com/zambias-advanced-world-class-smelter/>, accessed 15 May 2019. For an overview of how the recent concentrate import tax has negatively affected the downstream potential associated with Zambia's copper production, see Mining for Zambia, 11 January 2019, *op. cit.*

60 Personal interview conducted under the Chatham House Rule, Kalumbila, 29 March 2019. However, another interviewee explained that the application for endorsement for the multi-facility economic zone (MFEZ) from the government had been blocked after sitting with them for seven years. This MFEZ would be a blueprint for diversification if it were gazetted as such with the appropriate incentives.

Expedite transition towards secure property rights

One of the major challenges confronting the early development of Kalumbila was attaining title for land. An operations director of one of Zambia's largest mining companies noted at a recent conference that a number of investors in Kalumbila had given up starting businesses because it had taken over four years to approve land-title.⁶¹ The problem in Kalumbila has largely been resolved now, but if Zambia is to realise the AMV and its 7NDP more broadly, it urgently has to address the fact that 'at present, only 6% of land in Zambia is titled (only 160,000 title deeds [have been administered] across the country); the rest is under communal tenure and customary law'.⁶² In one of the most cited economics papers of all times, Acemoglu, Johnson and Robinson show empirically that 'countries with better "institutions", more secure property rights, and less distortionary policies will invest more in physical and human capital, and will use these factors more efficiently to achieve a greater level of income'.⁶³

Ease the costs of doing business

Beyond ensuring a credible system of secure property rights, islands of effectiveness are more likely to arise and expand if the costs of doing business (both financial and bureaucratic) are eased. Zambia is currently ranked 87th out of 190 countries surveyed by the World Bank in 2019.⁶⁴ While there is a notable improvement in 'getting electricity' from the 2018 score, one interviewee noted that electricity costs have – in real terms – increased threefold in the last decade.⁶⁵ Copper mining at increasingly low grades is also highly sensitive to cost variation, which policymakers should consider before making any changes to administered prices or taxes. As mentioned earlier, 600 tonnes of ore body have to be mined to produce 1 tonne of copper at a grade of 0.5%. For example, if a mine produces revenue of \$1.2 billion a year, \$100 million of which is gross profit, that margin will rapidly deplete to zero through any increase in revenue-based royalties or other production-related costs. Moreover, even if gross profits remain relatively high, investors also consider earnings before interest, taxes, depreciation and amortisation (EBITDA) as another indicator of a company's profitability; ie, earnings before the influence of accounting and financial deductions. Governments tend to see profits without recognising that oftentimes profits can remain roughly similar year-on-year at the same time as EBITDA is being eroded. But if EBITDA is on a declining trajectory, investors will not put up the capital required for re-investment, which will simply shorten the life of profit production.⁶⁶

61 Mining for Zambia, 'A \$200m mining town with a difference', 16 August 2016, <https://miningforzambia.com/a-200m-mining-town-with-a-difference/>, accessed 15 May 2019

62 Mining for Zambia, 'Building the post-mining future requires title deeds', 25 October 2018, <https://miningforzambia.com/building-post-mining-future-requires-title-deeds/>, accessed 15 May 2019.

63 Acemoglu D, Johnson S & JA Robinson, 'The colonial origins of comparative development: An empirical investigation', *American Economic Review*, 91, 5, 2001, p. 1369.

64 World Bank, 'Doing business: Ease of doing business in Zambia', http://www.doingbusiness.org/en/data/exploreeconomies/zambia/#DB_tax, accessed 15 May 2019.

65 Personal interview with finance executive, conducted under the Chatham House Rule, Kalumbila, 28 March 2019.

66 *Ibid.*

The World Bank has recently argued that ‘the future of copper mining is high-volume, low-grade’.⁶⁷ The high-grade, low-volume ore bodies have all been extracted, even in the DRC. It would therefore serve Zambian policymakers well to consider the cost structures associated with mining and ensure that they do everything within their power to keep Zambia competitive. As it is, Zambian mines are – on average – at the higher end of the cost spectrum when compared with other copper-mining jurisdictions.⁶⁸ An additional significant cost is that of transporting copper ore from the mine gate (having been processed to about 25% by then) to a smelter.⁶⁹ This is a significant cost not only to the mines but also in terms of road infrastructure. It would therefore also make sense for policymakers to consider government investment in rail infrastructure, which would serve all the mines well.

Create an enabling environment for smelting expansion

If Zambia is going to meet its copper production requirements in the near future, it will have to expand its smelting capacity (provided, of course, that it first fully utilises its current capacity). This will require an immediate reversal of the concentrate import duty, along with relevant fine-tuning of incentives to convince investors that this is a worthwhile long-term investment. If Sentinel mine in Kalumbila is to move to a production volume of 300 000 tonnes per year (which would be three-eighths of the total country output), it will require an expansion of the Kansanshi smelter, which is not an option under current governance conditions.

Focus on upstream linkages at the macro level

An interview with one executive in the upstream manufacturing space in Zambia revealed exactly the same concerns as those expressed by the mining companies. VAT returns to one big manufacturer have been zero thus far in 2019, pointing to a significant liquidity crisis for the state.⁷⁰ The interviewee also pointed out that the narrative around illicit financial flows was destructive for Zambia, as it created unnecessary mistrust between the private and public sectors – it started to serve government’s punitive policy proclivities to accuse companies of transfer (mis)pricing, trade (mis)invoicing and base erosion, instead of putting systems in place that ensured that no such movements could take place. This was confirmed in an interview with the Zambian Extractive Industry Transparency Initiative, which emphasised the importance of improved congruence and coordination between the Zambian Revenue Authority, the Ministry of Finance and the Ministry of Mines. These are crucial bureaucratic pre-conditions for attracting investment into Zambia, especially upstream of mining, and into mining itself.

67 Personal interview with mining executive, conducted under the Chatham House Rule, Kalumbila, 29 March 2019.

68 NGRI, *op. cit.*

69 This researcher was stuck behind numerous trucks between Solwezi and Kalumbila over the course of his field research. The impact on the roads is visible too.

70 Personal interview conducted under the Chatham House Rule, Lusaka, 27 March 2019.

Zambia's 7NDP shows that in 2000 manufacturing contributed 9.8% of the country's GDP, whereas by 2014 it only contributed 6.8%.⁷¹ Finance, along with agriculture, forestry and fishing, has diminished in importance. Fessehaie notes that this is attributable to supply firms (largely to the mining industry) not having time to adjust to the fast-paced process of mine privatisation, combined with trade and investment liberalisation. Little government support was forthcoming and 'the result was a reduction in local value-addition in the sectors providing inputs into mining, with the loss of existing, often low-level manufacturing and technological capabilities'.⁷² She adds that in an era of copper sector dynamism (future demand and therefore constant internal innovation and supply outsourcing to become competitive), 'Zambia needs to design and implement an industrial policy that tackles the key constraints on suppliers' competitiveness: skills, capital, infrastructure and technologies'.⁷³

The 7NDP argues that reducing the cost of energy is critical to propelling the manufacturing industry. As businesses across the world start to move away from reliance on centralised power, especially where it is unreliable, Zambian policymakers may find it useful to allocate its centralised hydropower to manufacturing firms at competitive rates while incentivising the production of decentralised micro-grids run on renewable energy such as wind and solar power. Over-reliance on hydropower (currently 97%) is a serious risk for Zambia as annual rainfall frequency declines across the continent, and current indications are that dam levels are not being well managed. In South Africa, for instance, both Sibanye-Stillwater and Anglo Platinum are planning solar plants to generate their own electricity.⁷⁴ If mines in Zambia generated their own power or procured it from independent producers, this would free up capacity from the state utility that can be dedicated to upstream manufacturing and downstream beneficiation.

Critical to Zambia's future prosperity will be to build a strong manufacturing and industrial base. As the 7NDP notes, this is a necessary condition for building a robust export-orientated economy that can weather external and domestic shocks (such as volatile commodity prices). It is also necessary for 'forging backward and forward linkages between primary, secondary and tertiary industries'.⁷⁵ But this will require more than catch phrases. It will require specific commitments to figuring out exactly where along global supply chains Zambia is likely to have a competitive edge and creating appropriate incentives for investment into those productive spaces.

Private sector dynamism can create virtuous cycles of growth.⁷⁶ Putting in place the right 'initial conditions'⁷⁷ for manufacturing growth may appear politically unattractive and

71 Zambia, Ministry of National Development Planning, 'Seventh National Development Plan 2017-2021', 2017, <http://extwprlegs1.fao.org/docs/pdf/zam170109.pdf>, accessed 9 August 2019.

72 Fessehaie J, 'What determines the breadth and depth of Zambia's backward linkages to copper mining? The role of public policy and value chain dynamics', *Resources Policy*, 37, 4, December 2012, p. 449.

73 *Ibid.*, p. 450.

74 Ryan C, 'Companies planning to go off the grid', Moneyweb, 14 May 2019, <https://www.moneyweb.co.za/mineweb/companies-planning-to-go-off/>, accessed 16 May 2019.

75 Republic of Zambia, Ministry of National Development Planning, *op. cit.*, p. 50.

76 Acemoglu D & JA Robinson, *Why Nations Fail: The Origins of Power, Prosperity and Poverty*. New York: Crown Books, 2012.

77 Rodrik D, 'Getting interventions right: How South Korea and Taiwan grew rich', *Economic Policy*, 10, 20, 1995, pp. 53-107.

may even result in the reduction of immediate tax revenue, but any broadening of the tax base, predicated on secure property rights, will soon more than compensate for short-term losses. In time, warranted investor confidence and a growing manufacturing sector will generate sufficient tax revenue for Zambia to again be seen as a credible debtor by its creditors, who are rapidly losing confidence.

Conclusion

This paper has highlighted that Zambia is currently in the throes of what Rodrik has termed premature deindustrialisation. More than that, it faces an immediate fiscal crisis. Until its financing challenges are addressed, a reversal of this deindustrialisation remains unlikely. A recent assessment by Merrill Lynch analysts⁷⁸ suggests that, ultimately, an IMF programme will be the only option. One executive wryly asked this researcher whether ‘China will continue giving us the money with which to hang ourselves’.⁷⁹ The Merrill Lynch report suggests that negotiations with China are slow in respect of continued borrowing. Other issues are sales tax uncertainty and declining foreign exchange reserves. The bank sees external financing requirements of at least \$1.5 billion per year to 2021. Given that no fiscal adjustments are likely ahead of the August 2021 elections, ‘Zambia might need to get much worse before it gets better’.⁸⁰

Notwithstanding these immediate concerns and the relatively unproductive tax regime changes that have been wrought since the 2019 budget speech was delivered, there are islands of effectiveness that have proved resilient. The critical element in these islands of effectiveness is ensuring that productivity-enhancing networks crowd out the threat of predation networks. Kalumbila is one example that is worth considering in great depth from a policy perspective to ascertain how it could be replicated elsewhere.

Based on a macro political economy analysis, supplemented by field research interviews, the paper also provides a tentative roadmap for industrialisation that is in line with the precepts of the AMV and Zambia’s 7NDP. It focuses on getting interventions right at the micro and macro levels. Creating the macro conditions for islands of effectiveness to thrive and expand is ideal. Yet in the absence of optimal macro conditions, islands of effectiveness can still emerge. In Zambia’s case, building strong spatial connections between manufacturing, mining and downstream value addition is a crucial dimension to making investment work in a high-cost environment. If these can be replicated, they will go a long way towards increasing the complexity of Zambia’s product space. Mining can and should provide a flywheel for economic diversification – a way out of the quiescence trap and into broad-based, inclusive and sustainable growth.

78 Yusuf R & A Macfarlane, ‘Zambia Viewpoint Worse before It Gets Better’. Bank of America Merrill Lynch, 2019.

79 Personal interview conducted under the Chatham House Rule, Lusaka, 27 March 2019.

80 Yusuf R & A Macfarlane, *op. cit.*

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Cover image

A miner uses a machine to excavate copper ore in an underground tunnel at the 296 meter level at the Nchanga copper mine, operated by Konkola Copper Mines Plc, in Chingola, Zambia (Waldo Swiegers/Bloomberg via Getty Images)

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