1. **Introduction**

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‘All vulnerable things must perish under the rolling and running of iron.’ So muses Oliver Mellors, the working class titular character in DH Lawrence’s 1928 novel *Lady Chatterley’s Lover*. This story is set in England’s East Midlands, a region vastly transformed by coal mining at the turn of the twentieth century. As Mellors descends into the darkness and seclusion of the woods, he resents the ‘evil electric lights’ and ‘diabolical rattlings’ of the mining machinery. In the ‘world of the mechanical greedy, greedy mechanism and mechanized greed, sparkling with lights and gushing hot metal and roaring with traffic’ lay a ‘vast evil thing’, a thing ‘[r]eady to destroy whatever did not conform’. Through the character of Mellors, DH Lawrence voiced his own antipathies. Born in a coal mining village to a coalminer father and school-teacher mother, the author’s hostility towards mining-led industrialization that pulsates throughout *Lady Chatterley’s Lover* has been ascribed to his belief that mining dehumanized his father and destroyed the English countryside of his birth.¹

More than one hundred years later, there are many who contend that mining is like a greedy, mechanized machine, now with global reach, that destroys all vulnerable things in its path. They might point out that mining has become one of the negative driving forces of the Anthropocene² – the term Crutzen coined in 2002 to supplement the Holocene and to signal human dominance of planet Earth.³ They might add that mining has always been associated with

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spectacularly unequal distribution of wealth, debunking claims that mining fosters equal development.4

Others contend, equally vociferously, that life as we currently know it could not subsist without the flow of mineral commodities, and that mining advances human civilization, sustainable development and poverty alleviation. In mineral-rich jurisdictions, for example, it is not uncommon to encounter metaphors characterizing mining as the engine of growth, the lifeblood or backbone of the economy or an instrument of national stabilization.5 Importantly, many also argue that a sustainability transition to counter the global threat of climate change cannot take place without strategic mineral commodities.6

‘Contention and ambiguity’ – these are the words Bebbington et al use to characterize the relationship between formal (largescale) mining and development. They continue:

‘Contentious’ because mining has so often delivered adverse social, environmental and economic effects for the many, but significant gains only for the few; ‘ambiguous’ because of the abiding sense, among local populations as much as development professionals, that just maybe mining could contribute much more. In the coexistence of such divergent feelings about mining and its human and environmental impacts lie the seeds of much conflict.7

This conflict is both ideological and material, and, at times, deadly. Following policy and legal reforms spearheaded by international financial institutions (IFIs) and the mining industry since the mid-1980s, mining has expanded dramatically in the developing world.8 On the minefields of mining’s new frontiers, the stakes could not be higher: ‘The life of the people involved; the physical survival of its members; the extractive companies’ survival in the market; the biodiversity at stake; the plans for life and death executed by the illegal, armed groups that swarm the minefields.’9 There is no shortage of

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7 Bebbington (n 4) 965.
8 Ibid.
research detailing the social conflict stoked by mining, and it is still the sector in which the greatest number of deaths of human rights defenders is seen.

Conflict persists notwithstanding a concerted and apparently well intentioned effort on the part of the mining industry to come clean on sustainable development. By the end of the twentieth century, a number of converging negative trends were exposing mining companies to growing reputational risk, threatening market acceptance of their products and placing their social licence to operate at risk. Following a number of smaller initiatives, the industry commissioned the Mining, Minerals and Sustainable Development Project (MMSD) to identify how it should respond to the societal expectation of sustainable development. The MMSD project became widely regarded as a ‘symbolic point’ in the mining sector’s engagement with broader debates on development and sustainability. Since that time, as this book shows, the mining industry and its supporters have engaged vigorously with issues of development and sustainability, albeit always from a vantage point that prioritizes the survival of the industry.

The MMSD project inspired a neoliberal, mainstream discourse on the sustainable development potential of the mining industry: a ‘sustainable mineral development consensus’ that has become widely adopted in developed and developing mineral-rich jurisdictions alike. Building on the earlier set of reforms aimed at promoting private investment in the mining industry, advocates of the consensus claim that sustainable development can transform mining industry practices and that mining can catalyze development that leads to poverty alleviation. The model of economic growth is private-led and extractives-based. The State plays a minimal role in production. It nevertheless plays a critical balancing and mediating function by facilitating and promoting mining while also regulating the industry to protect society from environmental and social (and, to a lesser extent, economic) impacts. The State is burdened with the expectation of preventing and resolving social conflict around mining and transforming the benefits associated with mining into more widely shared social goods.

11 See further the discussion in section 5.2 of Chapter 3.
The sustainable mineral development consensus still holds sway, but it has come under increasing, left-leaning, critique. Critics claim that instead of leading to ‘development’ and ‘sustainability’, mining is simply ‘extractivism’. This is a pejorative term highlighting ‘activities which remove great quantities of natural resources that are not then processed (or are done so in a limited fashion) and that leave a country as exports’ – a phenomenon that has deep roots in colonialism, extractive capital and the imperialist State. Critics maintain that the large-scale material extraction of natural resources has failed dismally as a developmental strategy. Rather than leading to the development and poverty alleviation promised by the World Bank, other IFIs and the mining industry, extractivism has continued to position developing countries on the periphery of global systems of production, to dehumanize people and to destroy the environment. Instead of balancing and mediation, under extractivism the State colludes with multinational mining companies to maintain conditions that lead to ‘adverse social, environmental and economic effects for the many, but significant gains only for the few’. The sustainable development turn has done little to change these trends. Critics hold that extractivist policies, laws and regulatory systems (or their absence) generally facilitate highly unequal terms of trade, externalize social and environmental costs, allow for profits to be repatriated to the global North and guarantee a cheap labour force and compliant citizenry.

The same critics have also observed a new strand of extractivism in ‘progressive’ left-leaning States in South America, a phenomenon Gudynas named ‘neoextractivism’ in 2010. States in which neoextractivism holds sway have not eschewed classic extractivist practices: they continue to position extractive industries as a pillar of development and externalize social and environmental costs. But unlike the minimalist State of private-led extractivism, the State plays a more active role. This may include State participation in production, such as State-owned mining companies, joint ventures and free carried interest in mining companies. In other instances, States have revised contracts and increased taxes in order to win a greater share of the benefits of mining for

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16 Bebbington (n 4) 966.

17 Womin (n 14) 8.
purposes of national development. These trends have also been observed in Africa, although here more commonly under the banner of ‘resource nationalism’.

Critics hold that neoextractivism binds resource-rich countries even closer to their nonrenewable, extractive industries, a situation that perpetuates international subordination. Moreover, under neoextractivism social and environmental impacts have allegedly increased. Actions to confront and deal with them are ‘still ineffective and even, on occasion, have been weakened’. Under neoextractivism the State stirs itself to some attempt at balancing, mediation and transformation, but only insofar as economic benefits are concerned. Neoextractivism improves upon the neoliberal strategies of previous decades, but critical engagement with its tenets and approaches remains imperative. Critics refuse to see neoextractivism as a promising alternative, especially insofar as social and environmental outcomes are concerned.

Extractivism and neoextractivism both rest on the concept of development. Spanning the divide between neoliberal and socialist approaches to economics, development is rooted in an ideology of progress driven by the project of Modernity. As Gudynas has argued, as a school of thought Modernity adheres to a Cartesian knowledge system (affirming the possibility of truth and falsity and excluding other knowledge systems), restricts ethical values to the human sphere, understands history as a temporally linear process (from conditions of backwardness to a brighter future) and stresses the duality of society and nature. All these ideas are present in a contemporary ideology of progress that makes economic growth synonymous with development, to be achieved through increased investments and exports. Extractive industries, inclusive of mining, oil and gas, enjoy pride of place in this paradigm because it is believed

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18 Gudynas (n 14) 3ff.
19 See Michael Solomon (compiler), The Rise of Resource Nationalism: A Resurgence of State Control in an Era of Free Markets, or the Legitimate Search for a New Equilibrium (South African Institute of Mining and Metallurgy 2012). Unless otherwise indicated, references to ‘neoextractivism’ in this work include the trend of resource nationalism in Africa.
20 Gudynas (n 14) 5.
21 Ibid 7.
22 The connection between ideas of development, the sustainable mineral development consensus and neoextractivism is canvassed in Chapter 2.
24 Ibid 18.
they will achieve this export-led growth.\textsuperscript{25} The mandate to foster progress through extractives justifies the largescale appropriation and destruction of nature. Schools of thought as diverse as the dependency and Marxist theorists of the 1960s, the neoleiberal of the 1980s and the progressives that emerged in the early 2000s have rejected ecological limits to perpetual economic growth, minimized the impacts of the extractive industries or argued that losses can be compensated for economically.\textsuperscript{26}

As a viable alternative, intellectuals and activists have put forward the notion of postextractivism, understood as indispensable extraction of resources.\textsuperscript{27} Postextractivism is one of many transition discourses that attempt to plumb alternatives to development rather than development alternatives, that is, ways of thinking that sidestep the Modernist obsession with progress, economic growth and the special role assigned to extractive industries. Under postextractivism, the intent would be to vastly reduce extraction, promote sustainability through recycling, close ‘unfair’ material and resource flows, reduce emissions and radically reduce pressure on ecosystems.\textsuperscript{28} Acosta links postextractivism to the mission of ‘serious and responsible degrowth’ in the global North,\textsuperscript{29} and envisages a ‘well thought-out transition’ from the current state of obsession with economic growth and extractivism/neoextractivism:

Overcoming extractivism and its colonial shackles is a fundamental condition to overcome underdevelopment. However, on the way out of an extractive economy, it will be necessary to continue such activities for some time. A well thought-out transition, firmly adopted by society, will be needed. It should become very clear that a solution to this complex dilemma of societies that are rich in natural resources yet remain cursed to an almost inevitable impoverishment will not be reached by maintaining, or worse, deepening extractivism.\textsuperscript{30}

The theory of postextractivism is noble and resonates with current broadranging debates on planetary and social boundaries to growth and development.\textsuperscript{31} However, calls for a well thought out transition and the firm adoption of a fundamentally new paradigm must reckon with the dynamics that hold an extractivist/neoextractivist paradigm in place with such strength. Why is the position

\begin{itemize}
\item \textsuperscript{25} Ibid 25.
\item \textsuperscript{26} Ibid 28.
\item \textsuperscript{28} Womin (n 14) 8.
\item \textsuperscript{29} Alberto Acosta, ‘Post-growth and post-extractivism: Two sides of the same cultural transformation’ (2016) 3(1) \textit{Alternautas} 50, 59.
\item \textsuperscript{30} Ibid 61.
\item \textsuperscript{31} These debates are outlined in section 5 below.
\end{itemize}
of States towards mining so entrenched, notwithstanding strong resistance? Is it the case that the State simply promotes the extractive industry and colludes with mining companies in a manner that is blind to the suffering of people and environment? And what exactly would need to be undone in the move towards a ‘well thought out transition’?

2. ARGUMENT OF THIS BOOK

This book acknowledges that while mining still externalizes social and environmental costs, over the past two decades the mining industry and some mineral-rich jurisdictions have attempted to reposition this industry within a normative framing of ‘sustainable development’, ‘sustainability’ or ‘responsibility’. It recognizes that mining takes place in developing and developed countries and that resource extraction conflicts arise in both broad contexts. This book shows that in both types of context, the State is vested with an extensive set of roles that revolve around promoting mining and protecting society from its impacts. It contends that models of ‘sustainable’ or ‘responsible’ mining serve a legitimating function, keeping alive the hope of a socioecologically bounded mining sector. It also argues that it is the tension itself—the push for mining and the pushback against its impacts, a paradox that is felt most strongly in the State mechanism—that holds the current system of unsustainable global mining production in place. This book condemns unsustainable and irresponsible mining, and supports all efforts to chip away at this hard edifice. But it expresses reservation as to whether a ‘well thought out transition’ to postextractivist mining is possible without a fundamental shift away from the positioning of mining and other extractives within an ideology of progress, and without dismantling an intricate system of narratives, rules and rights in which mining and the hope of its development and sustainability potential are entrenched.

This book draws upon Karl Polanyi’s understanding of the ‘market society’ and the ‘double movement’ presented in his 1944 work *The Great Transformation*. In this great work, Polanyi outlined his understanding of the transition from traditional societies to the (still prevailing and now global) market society, being a way of life in which an increasing array of social relations is subjected to the demands of the market. Zaman has said that Polanyi’s conceptual frame has been little understood, though it is of vital importance for the task befalling the global community. This book contends that it is of

33 Asad Zaman, ‘The rise and fall of the market economy’ (2011) 14(2) International Association for Islamic Economics 123, 124.
equally vital importance for understanding and recasting the State’s role in relation to mining, development and sustainability.

Polanyi’s conceptual frame is presented in section 6 of this introductory chapter. In preparation, and in support of the broad claims made in this introductory section, the chapter now proceeds by outlining globalized demand, globalized supply and globalized impacts relating to the mining of energy and hardrock minerals.

3. GLOBALIZED DEMAND: SOCIETY’S UNEQUAL CONSUMPTION OF MINERALS

The use of minerals, and mining as the correlating activity of supply, is as old as the Homo genus. In fact, there is ample proof that even hominids such as species of Australopithecus used stone tools more than 2.5 million years ago. Minerals and mining were key to the welfare of ancient societies, from the toolmakers of Olduvai Gorge, who belonged to the Homo habilis genus, to the Neolithic miners who dug for flint in southern and western England, to the trading networks that sustained ancient Egyptian, Greek, Roman and African civilizations with construction and energy minerals and precious metals.

Over the course of time, human society’s appetite for minerals has become voracious. With the advent of the industrial revolution, mineral commodities were needed to make and power the steam and then diesel and gasoline-fuelled engines that drove unprecedented increases in productivity and forged the path for capital accumulation. From the late 1900s onwards, significant changes in the industries consuming industrial minerals and metals and major historic events further affected mineral production and use. Demand massively increased to meet the technological advances in agriculture, communications, energy generation, construction, health services, transportation and the military. Glover and Morse point out, for example, that over the span of the twentieth century, demand for metals and minerals in the USA increased

36 Ibid 31.
39 Ibid.
40 Ibid 1.1–1.3.
Introduction

from about 160 million tons to 3.3 billion tons per year.\textsuperscript{41} Turning to a global figure, total material extraction during the twentieth century increased by a factor of eight,\textsuperscript{42} amounting to 59 billion tons per year at the beginning of the twenty-first century.\textsuperscript{43} This is an enormous figure – equivalent to the amount of biomass produced annually by green plants using photosynthesis, thus positioning anthropogenic material extraction in the same order of magnitude as global material net primary production.\textsuperscript{44}

Along with an exponential increase in global materials use, there has also been a qualitative change in global material metabolism: nonrenewable materials are being used more than ever before. While biomass accounted for three quarters of all extracted materials in 1900, by 2005 its share had declined to a third.\textsuperscript{45} In the decades between the end of the Second World War and the oil price peak in the 1970s, the proportion of materials extracted shifted rapidly from renewable biomass to nonrenewable mineral materials, a phenomenon Wrigley describes as a shift from an advanced organic economy to a mineral economy.\textsuperscript{46} By the start of the twenty-first century nonrenewable resources accounted for more than 70 per cent of total materials use, a share that is still increasing.\textsuperscript{47}

Society’s demand for nonrenewable mineral materials is also highly unequal. While growth in the extraction of biomass seems to be linked to population growth, use of nonrenewable minerals is more closely linked to economic growth.\textsuperscript{48} Over the course of the twentieth century the developing world’s contribution to global materials use has mostly been due to increase in population, which has driven global biomass extraction. In contrast, the growth in the rate of nonrenewable material extraction can largely be attributed to industrialization and postwar prosperity in Europe, North America, Japan and the USSR. As Krausmann \textit{et al} note:

In the year 2000, fully industrialized countries (inhabited by 15\% of the world population) were directly responsible for one third of global resource extraction; this imbalance is even more pronounced for key materials such as fossil energy carriers,

\begin{itemize}
  \item \textsuperscript{41} Ibid 1.1.
  \item \textsuperscript{42} Comprising agricultural materials, industrial minerals and metallic ores, construction minerals and fossil fuels.
  \item \textsuperscript{43} F Krausmann \textit{et al}, ‘Growth in global materials use, GDP and population in the 20th century’ (2009) 68(10) \textit{Ecological Economics} 2696, 2699.
  \item \textsuperscript{44} Ibid 2707.
  \item \textsuperscript{45} Ibid 2700.
  \item \textsuperscript{47} Krausmann (n 43) 2707.
  \item \textsuperscript{48} Ibid 2708.
\end{itemize}
industrial minerals and metallic ores, where the share of the industrial countries is above 50\%\textsuperscript{49}.

This trend is shifting with a rapid rise in the social metabolism of China, India and several Latin American countries. In the early 2000s, exceptionally strong demand for minerals and metals in China and India drove metal prices to record nominal highs\textsuperscript{50}. China emerged as the largest consumer of total main metals in 2003, and consumes about a quarter of world metal production\textsuperscript{51}.

Jébrak divides society’s demand for minerals since the late 1800s into three periods of globalization, interspersed with two periods of crisis\textsuperscript{52}. From the late 1800s to the outbreak of the First World War (first period of globalization), the demands of industrialization in Europe, the USA and Japan spurred an increase in the use of iron and coal. Despite a colonial structure that supported mineral exploration all over the world, the demand for minerals was still largely filled by local mining suppliers, with limited input from Third World countries\textsuperscript{53}. The period from 1918 to 1945 was a time of political turmoil and economic depression and saw the first global mineral commodity downturn. Despite two World Wars that increased the demand for aluminium, nickel and tungsten, the price of copper and other metals fell\textsuperscript{54}. Gold was the outstanding exception\textsuperscript{55} and the maintenance of the gold standard led to a boom in gold mine exploration, development and production\textsuperscript{56}. The postwar reconstruction period from 1945 to the mid-1970s led to a second period of globalization. The birth of the automotive industry and an explosion in consumer goods reliant on electricity generated enormous demand for construction minerals, base metals (copper, iron and bauxite-aluminium) and rarer metals such as chromium, titanium and platinum\textsuperscript{57}. The sources of mineral supply also began shifting to the territories.

\textsuperscript{49} Ibid 2710.
\textsuperscript{51} Ibid 5.
\textsuperscript{53} Ibid 14.
\textsuperscript{54} Ibid 20.
\textsuperscript{56} Jébrak (n 52) 20.
\textsuperscript{57} Ibid 23.
of the nondeveloped world, corresponding with an increase in State control of the mining industry. The oil crisis marked the beginning of the second crisis period, as resource-rich oil-producing States attempted to gain more power on a global scale. The oil crisis, together with expropriations and labour and political unrest, slowed growth in developed countries, reducing demand for metals. A widespread drop in metal prices was accompanied by a marked reduction in mining company activity. By the turn of the century, however, a revolution in communication and renewable energy technologies and the increased involvement of the BRIC States in the world economy led to a surge in the scope and quantity of mineral demand. In some commodities, annual per capita consumption increased tenfold. Some commodities reached record prices, also driven by the low yield of discoveries in the previous period. Between 2003 and 2008 the real prices of energy and metals more than doubled. Since that time, however, and following the 2008 global recession, the outlook for the mining industry has dimmed once again.

Future global mineral demand will be based on (1) uses for mineral commodities; (2) population growth; and (3) standard of living. Based on these variables, Kesler estimates that the combined total increase in global mineral demand will be in the region of 1 per cent per year. Notwithstanding the possibility of recycling certain commodities, and assuming a business as usual approach to current systems of economic production and social reproduction, ‘the trend toward gradually increasing global demand has been clear for many decades and is likely to remain in place’.

Mineral commodities are also key to a global sustainability transition. So-called green minor metals such as indium, germanium, tantalum, lithium and rare earths are critical inputs to future sustainable technologies for the generation and conservation of energy which are needed for the existential crisis

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58 Ibid.
59 Ibid 30.
60 Ibid 37.
61 Ibid 38.
62 For example, annual per capita consumption of copper increased from 485 grams in 1990, to 4,343 grams in 2010. See Jébrak (n 52) 38.
63 Ibid 39.
66 Ibid.
of our time – climate change. The much-touted ‘fourth industrial revolution’ (4IR), characterized by a fusion of technologies that blur the line between the physical, digital and biological spheres, will also require major mineral inputs. World Economic Forum executive chairperson Klaus Schwab describes the 4IR as ‘a technological revolution and that will fundamentally alter the way we live, work and relate to one another’. And yet, as the World Economic Forum has itself acknowledged, the 4IR will be a nonstarter without the batteries enabling mass storage on a mass scale. Such batteries will in turn require supplies of lithium, nickel, cobalt, manganese and aluminium, among others. As Kesler concludes, ‘increases in demand for minerals are almost inevitable for the next 50 years or so unless there is a major breakdown in global economic activity or a catastrophic decrease in world population’.

4. GLOBALIZED SUPPLY: TRENDS IN FORMAL MINING

Over the past 150 years the supply of minerals to meet society’s voracious demand has been met by both formal, largescale, industrial mining as well as by the large and burgeoning artisanal and smallscale mining sector (ASM).

ASM is a significant economic sector, constituting a livelihood strategy for millions of people in more than 80 countries, and in sub-Saharan Africa, Asia, Oceania and Central and South America in particular. The exact number of people working in ASM is unknown, but the figure is believed to have increased sixfold over little more than 20 years, reaching an estimated 40.5 million people in 2017. Taking into account relations of dependence on ASM miners, the total number of people dependent on the sector is calculated to

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70 Kesler (n 65) 58.
71 Definitions of ASM vary, and may focus on level of mechanization, number of miners, production capacity of the mine, size of capital investments and size and scale of the operation. In some countries, ASM is also reserved for nationals of that jurisdiction.
73 Ibid.
ASM operators are believed to work on more than 30 different minerals, although the sector’s contribution to global supply differs from commodity to commodity. The problematic environmental, health and safety and social effects of ASM are well documented, but formalization of the sector has proven difficult.

This book is about formal mining only. The governance narratives and issues associated with ASM are distinct and complex, meriting their own coverage in a monograph of this length. In many countries ASM is still an informal and illegal activity, vilified for its associations with social conflict, environmental degradation and human rights violations. Perceptions of ASM vary widely from country to country, as do regulatory frameworks, where these have been set in place. There are nevertheless many linkages between ASM and formal mining. The latter has its roots in ASM and the forms of organization that flowed from early prospecting operations in the nineteenth century. In the mid-1800s, target mineral deposits of iron, copper, nickel and gold were still largely discovered serendipitously in old excavations, and extractive technologies were largely confined to prospecting using handheld instruments and field geology. Early mining regulatory frameworks such as the federal General Mining Law of 1872 in the USA respond more to the needs of ASM than those of industrial mining. In many parts of the world, lowtech, labour intensive mining activities take place in close proximity to the capital intensive operations of formal mining, sometimes even on the same concession. Some have even argued that the same conditions that have facilitated foreign direct investment in largescale mineral exploration and exploitation have also fuelled the explosive growth of the ASM sector.

The focus thus turns to formal mining, and the manner in which the industry has responded, and developed in response to, society’s mineral demand. The following sections explore formal mining as an integrated production system, the extent of private and public investment in formal mining, the geographical extent of formal mining and the profitability of the mining industry.

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74 Ibid.
75 Ibid 3. High levels of contribution include global sapphire supply (80 per cent), and gold (up to 20 per cent).
77 International Institute for Sustainable Development (n 72) 3.
78 Jébrak (n 52) 17–19.
79 International Institute for Sustainable Development (n 72) iv.
80 See Hilson (n 76).
4.1 An Integrated, Globalized Production System

By the turn of the twenty-first century, the formal mining industry exhibited the features of an integrated production system aligned with the mining cycle.\(^{81}\) The mining cycle commences with a specific demand for minerals, which spurs investment in exploring or prospecting, and then mine construction and development if an economically viable reserve is proved. After a period of mine operation – the only phase during which a mine can expect to make profits – the cycle moves to decommissioning and rehabilitation once an ore reserve becomes depleted. Depending on the socioecological features of the mine site, the cycle then moves to a period of managing residual and latent impacts.

Companies of different sizes and scales of operation constitute an integrated production system by occupying identifiable niches within this cycle. As *Breaking New Ground*, the final report of the MMSD project, explains: ‘Junior companies find new ore bodies and sell them to larger companies. Intermediaries offer growth potential through merger among themselves or by being taken over by the largest operations. Miners feed product to smelters and refiners, who in turn provide metals or mineral products to fabricators, and so on.’\(^{82}\)

The corporate landscape of the mining industry can thus be visualized according to a simple distinction between juniors or explorers, which are nonproducing entities; ‘majors’ (large producing companies, frequently with transnational operations); and ‘intermediaries’ (all other producing companies, at times formed to exploit only a single deposit).\(^{83}\) Many of the companies that are now majors were established in the mid-1800s: Broken Hill Proprietary in 1863, Rio Tinto in 1873, and Anglo-American in 1917, for example. Through their association with international finance houses and development of ‘world class’ deposits, these companies gained a headstart in the business of minerals extraction.\(^{84}\)

Various commentators have noted a trend of consolidation or concentration in the mining industry over the past 50 years. Based on data sourced by the

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\(^{82}\) Ibid 60. This patterning is nevertheless not homogenous across commodities, and for some, operations tend to be more vertically integrated.

\(^{83}\) Magnus Ericsson, ‘Mining industry corporate actors analysis’ (March 2012) Polinares (EU Policy on Natural Resources) 3. More elaborate typologies exist: see for example Figure 3.3, *Breaking New Ground* (n 81) 60.

\(^{84}\) Jébrak (n 52) 15.
Raw Materials Group, Mitchell highlighted an increase in corporate concentration for most major minerals for the years spanning 1975–2005. During this period, for example, the percentage of platinum production controlled by the top five producers shifted from 63 per cent to 86 per cent. Copper, iron ore and aluminium exhibited similar trends. Ericsson’s corporate actor analysis for the mining industry affirms continuing consolidation post-2005, with an increasingly diminishing number of intermediaries. In 2005, the intermediary level of production included some 957 companies, but by 2009 this figure had been reduced to 305. In 2012, HSBC observed that six large companies controlled the mining of industrial minerals, and about eight companies constituted ‘seniors’ in the gold mining sector. The conclusion to which this analysis points is that globally, a limited number of companies control an increasing share of the mining industry.

Counterintuitively, the number of mines actually producing metal ores using mechanized methods is quite small: some 2500, based on a 2012 analysis. The spread between the largest and smallest mines is also large. In 2012, just 13 open pit mines were responsible for 20 per cent of the volume of metal ore hoisted annually in the world. The production rate at these mines exceeded 50 Mt of ore annually. A further hundred mines produce more than 10Mt of ore per year, with the remaining 2400 producing considerably less than that. Even smaller mines, however, can have significant socioecological impacts.

Metals and mining has been called ‘the oldest truly global sector’ because all mining producers are disciplined by global commodity prices, and cross-border investment is common. While there are national, regional and commodity-specific mining associations, in the early 2000s the mining industry also mounted a global institutional and advocacy response to mounting criti-

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87 BHP Billiton, Rio Tinto, Anglo American, Xstrata, Glencore and Vale.
88 EMA Equity Research, HSBC ‘Metals & Mining’ (June 2012).
89 Ibid.
90 This figure excludes Chinese mines, which are on average comparatively small (Ericsson (n 83) 4).
91 Ibid.
92 EMA Equity Research (n 88) 5.
cism of its economic, social and environmental impacts, as will be explained in Chapter 2. And, as outlined in Chapter 3, the industry faces increasingly globalized forces of resistance.

4.2 Public and Private Investment in Formal Mining

Over the past 150 years, both the public and private sectors have invested extensively in the production of mineral commodities along the mining cycle. At present, private ownership of the factors of mining production – distinct from ownership of the minerals in the ground – is higher than ever before. But this has not always been the case. Recalling Jébrak’s categories of globalization and crisis outlined in section 3 of this chapter, State intervention in hardrock mining production tended to increase in the intervening periods of crisis. During the 1960s, for example, a swathe of nationalizations in the developing world resulted in the expropriation of several foreign mining companies. These nationalizations rode on the momentum of calls for a New International Economic Order, and the developing doctrine of permanent sovereignty over natural resources. Upon gaining independence from European powers, many countries in the developing global South were determined to use mineral extraction to leverage economic and social development. By this stage, though, the supply of raw mineral materials from the global South had already become entrenched in the global North’s industrialization processes. While the hope was that nationalized mining industries would serve as engines of economic growth and rapid industrialization, many of these Statist policies failed. In countries where nationalization had taken place, the industry often stagnated, and even declined. Many internal and external factors contributed to this state of affairs, including a fall in the global price of mineral commodities, the inability of State-owned mining industries to access capital and low reinvestment in mining assets.

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93 Breaking New Ground (n 81) 64; Mitchell (n 85) 24.
95 Jébrak (n 52) 24.
96 For an account of these dynamics see, for example, Boni Campbell (ed.), ‘Regulating mining in Africa: For whose benefit?’ Discussion Paper No. 26 (Nordika Africa Institutet 2004).
98 Ibid.
In the 1980s there was a fundamental paradigm shift and redefinition of
the role of the State which centred on almost complete withdrawal from
the process of mining production (the minimalist State). Instead of actively
engaging in mining, the minimalist State was responsible for promoting and
facilitating mining through, among others, favourable institutions of property
and taxation. At the same time, the State was burdened with regulating private
mining proponents to ensure that the worst economic, social and environmen-
tal impacts associated with mining did not materialize. This is the model of the
State associated with the sustainable mineral development consensus, and the
extractivist critique outlined in section 1 above. Bretton Woods institutions
played an important role in this paradigm shift. Rather than simply financing
public or private sector projects during the 1980s, the World Bank began to
focus on mining as a driver of development, providing financial and technical
support to mineral-rich jurisdictions to reform their mining codes and practic-
es. By the early 2000s more than 90 States had adopted new mining laws or
revised their mining codes to increase foreign direct investment in the mining
sector. The mining reforms giving effect to a reduced State were embedded
within a broader package of economic reforms focused on liberalization of
imports and export promotion, liberalization of exchange controls, fiscal
reform, State-owned enterprise reform, privatization, reduction of public
expenditure and reform of public sector management.

More recently, in certain regions (Latin America and, to a lesser extent,
Africa), States have reasserted a role in mining production to better position
mineral extraction within a national development project. Positively framed
as resource nationalism and critiqued as neoextractivism, in this role the more
assertive State steps in to force a free carried interest in private mining enter-
prises, raises taxes, revises contracts or forms State-owned mining companies.
The State’s responsibility to protect environment and society in this paradigm
is still asserted, but comes into conflict with calls to use natural resources for
national development projects.

The public sector has also invested in the supply of mineral commodities
throughout the modern history of formal mining in less obvious, less visible
ways. In the late nineteenth century, huge public investments were made in
education, to develop institutions equipped to develop and impart the high-
level skills necessary for a competitive edge in mining production. In the
USA, the Columbia School of Mines was established in 1964, and more than

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99 Kato Lambrechts (ed.), Breaking the Curse: How Transparent Taxation and Fair
Taxes Can Turn Africa’s Mineral Wealth into Development (Christian Aid 2009) 7.
100 Gavin Bridge, ‘Mapping the bonanza: Geographies of mining investment in an
20 universities across that country quickly followed suit.\textsuperscript{101} Mining schools were also set up in other developed and developing jurisdictions.\textsuperscript{102} Further, a number of States invested in developing national geological surveys. The oldest and most respected among these, the British Geological Survey and the United States Geological Survey (USGS), were set up in 1835 and 1879 respectively.\textsuperscript{103} But again, such initiatives were not confined to the developed world. In 1896, Khedive Ismail, the Khedive of Egypt from 1863 to 1879, established the Egyptian Geological Survey,\textsuperscript{104} and in South Africa the Geological Commission of the Cape of Good Hope was founded in 1895.\textsuperscript{105} In addition to the major public investments in transport infrastructure required to move mining ore from sites of extraction to sites of processing, the public sector has also consistently borne the cost of mining externalities, absorbing the healthcare costs of miners sickened by occupational diseases and the high costs of the atmospheric, soil and water pollution associated with mining. Given the State’s absorption of the costs of these externalities, the geography of formal mining is pertinent.

4.3 The Geographical Extent of Formal Mining

A popular narrative suggests a geographical restructuring of mining investment as mineral-rich jurisdictions in the developing world have instituted neoliberal reforms and opened their mineral resources to foreign direct investment. This process is frequently interpreted ‘as a process of globalization through which mineral rich (but otherwise very poor economies) in the developing world are experiencing an investment bonanza’.\textsuperscript{106} The narrative concomitantly assumes a withdrawal of mining investment from established targets in the global North.\textsuperscript{107} Bridge affirms a geographic shift in investment following on the heels of extensive neoliberal reforms of law and policy in several mineral-rich

\textsuperscript{101} Jébrak (n 52) 16. The famous Colorado School of Mines was established in 1874.
\textsuperscript{102} Some of the earliest mining schools were established in Australia (Bendigo School of Mines, 1883), Brazil (Ouro Prêto Mining School, Brazil, 1876), Canada (Department of Mining Engineering at McGill University, 1870), China (Jiaozuo School of Railroad and Mines, 1909, later the Chinese Institute of Mining and Technology, 1909), and South Africa (SA School of Mines, Kimberley, 1896, later the School of Mines at the University of the Witwatersrand).
\textsuperscript{103} See further section 1.1.2 of Chapter 4.
\textsuperscript{106} Bridge (n 100) 417.
\textsuperscript{107} Ibid.
jurisdictions. His research shows, however, that, contrary to popular belief, a largescale and even shift in private investment has been confined to a few ‘rising’ stars in the developing world (Chile, Peru, Indonesia), and that mature destinations have continued to attract investment.\textsuperscript{108} In the boom years of the mid-1990s, for example, neoliberal reforms opened up new jurisdictions to exploration and mine development, but not all liberalizing mineral-rich countries saw investment inflows.\textsuperscript{109} Bridge concludes that neoliberal reforms did not erase existing uneven patterns of mining investment, although they increased the extensity of investment targets. At the same time they contributed to new patterns of differentiation, as some countries attracted the lion’s share of new investment, and then mainly during the boom years.\textsuperscript{110}

4.4 The Profitability of the Mining Industry

On average, the mining industry has not been profitable over the past 40 years. Profitability is a social construct, a variable dependent upon input costs, financing costs, inflationary trends, taxes and the extent to which externalized costs are internalized, among others. Nevertheless, according to standard measures of profitability – market capitalization, return on capital, return on shareholder equity – the performance of the mining industry relative to other sectors has been poor, even as aggregate data is ‘surprisingly sparse’.\textsuperscript{111} In the early 2000s, the financial performance of nonferrous metals, steel and gold was falling increasingly below the global price equity index.\textsuperscript{112} And the outlook for return on capital and return on shareholder equity also looked bleak. Between 1977 and 1999 the average return on capital was 6.9 per cent, with a lower 5.7 per cent return on shareholder’s equity.\textsuperscript{113}

However, even as some prophesied that the sector had lost traction and would never regain lost ground,\textsuperscript{114} between 2003 and 2007 mining indices rose spectacularly, responding to strong commodity demand from China, India and other developing countries.\textsuperscript{115} Between 2006 and 2007, record high commodity prices sent the indices of mining companies soaring above

\begin{flushright}
\textsuperscript{108} Ibid 406.
\textsuperscript{109} Ibid 417.
\textsuperscript{110} Ibid 419.
\textsuperscript{111} P. Crowson, ‘Mining industry profitability?’ (2001) 27 Resources Policy 33, 35.
\textsuperscript{112} Breaking New Ground (n 81) 114.
\textsuperscript{113} Crowson (n 111) 35.
\textsuperscript{114} Ibid 33.
\end{flushright}
the world share index. When the financial crisis hit in 2008, the industry was partially insulated by expectations that Chinese growth would support a mining recovery, and mining companies rebounded between 2009 and 2011. Awash with cash, mining management ploughed the money into bigger and more marginal assets, rather than paying out dividends to shareholders. However, from 2011 the value of mining share prices again began to erode relative to broader market indices, reaching a point in 2015 lower than that in the 2008 financial crisis. In 2015, the top 40 mining companies reached lows that were ‘stark and irrefutable’: their first collective net loss, the lowest return on capital employed, unprecedented restrictions on capital expenditure and debt and impairment levels that sent leverage to new heights. At the height of the 2003–7 boom the market capitalization of the top 40 mining companies exceeded combined book values by US $1 trillion; by 2015 this had shrunk to just US $18 billion. ‘All gains made during the commodity super-cycle were effectively wiped out.’ However, a mere two years later the pundits were applauding a ‘stellar financial performance’ and cautiously predicting a positive outlook for the industry.

While the first truism of the mining industry’s profitability is therefore that on a long run average, and relative to other industries, the mining industry’s performance is disappointing, the second is that the industry is volatile and exhibits boom and bust cycles. This means that in some years, mining companies and their investors can make windfall profits. So while the average return on capital between 1977 and 1999 was a mere 5.7 per cent, in some years the return rocketed to more than 20 per cent. This variability, and the potential for a windfall investment, points to one of the reasons investors continue to put their money into mining stocks. As Crowson puts it:

[N]either investors nor mining companies invest in the expectation of achieving the industry’s average rate of return. The lure has been the pursuit of riches beyond the dreams of avarice. They have always sought the glittering prizes, those deposits that, for one reason or another, offer prospective returns well above both their own cost of capital, and the relatively low average.

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116 EMA Equity Research (n 88) 3.
117 PwC (n 115) 15.
118 Ibid 17.
119 Ibid 3.
120 Ibid 16.
121 Ibid 13.
123 Crowson (n 111) 35. See chart 8.
124 Ibid 37.
Various reasons have been put forward for these two truisms of mining industry profitability: there are long lead times between the decision to invest and project startup, and the demand for a particular commodity may change significantly before a project comes on stream. Since a large portion of the cost of setting up a project is fixed, project proponents may be forced to proceed, in turn flooding supply when the mine becomes operational and putting downward pressure on commodity prices. There are different market structures for different mineral commodities, and some are more oligopolistic than others. But in other cases there are low barriers to entry and/or competition from ASM mining, making efforts at restricting supply difficult.

The cyclicality of commodity pricing is often posited as the primary cause of the boom and bust nature of the industry. Further, some researchers argue that the pronounced cycles in commodity pricing exhibit a declining trend. According to the Prebisch–Singer hypothesis, for example, there is a tendency for primary commodity prices to deteriorate relative to manufactured goods over long-run cycles. Recently, Erten and Ocampo tested and found support for the Prebisch–Singer hypothesis: for minerals (as for agriculture) the mean of each cycle in prices was significantly lower than the previous one, inclusive of the 2003–7 boom. This supports the view that real commodity prices exhibited a stepwise deterioration over the past century.

There is a fair degree of consensus that the cyclicality of commodity pricing is driven by demand shocks rather than supply shocks. In one of the first papers to examine demand and supply shocks over more than a century (1840–2010),

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125 Ibid 41.
127 EMA Equity Research (n 88) 10.
128 Crowson (n 111) 38.
129 Building on the work of Kondratiev and Schumpeter, Prebisch and Singer studied the longrun cycles of commodity prices in the 1950s. They concluded that in terms of the international division of labour of the time, an improvement for Britain’s terms of trade could be understood as a deterioration for the terms of trade of countries exporting primary commodities. Singer further showed that the terms of trade between innovative products and standardized products also tends to deteriorate. Thus, while developing countries may pursue policies of industrialization and produce manufactured goods, they would be producing standardized products which would not reap the same level of economic rents arising from innovative products. A key dimension of the Singer–Prebisch hypothesis is that the prices of primary commodities rise faster than manufactured goods during the upswing of a supercycle, but then excess capacity and supply pushes those prices down relative to final manufactured goods. See Bilge Erten and José Antonio Ocampo, ‘Super-cycles of commodity prices since the nineteenth century’ (January 2012) Initiatives for Policy Dialogue Working Paper Series 5–6.
130 Ibid 17, 28.
Stürmer found that price fluctuations in copper, lead, tin and zinc were generally driven by shocks in demand rather than supply. Demand shocks are forms of unexpected strong growth of world output leading to supply shortages, and supply shocks include physical disruptions in supply, such as labour strikes, and cartel action, such as restricting production and stockpiling. For mineral-rich jurisdictions, one of the most interesting results of Stürmer’s study is that over the long run self-imposed restrictions on supply by exporting countries are at best only temporarily effective in increasing prices.

During boom times the mining industry has tended to respond by expanding production capacity, and during bust times by cost cutting. Both tendencies affect the intensity and gravity of mining’s economic, social and environmental impacts. Extending production capacity and cost cutting are even linked, as ‘all too often, a reduction in cash costs has only been achieved through the investment of additional capital’. As Crowson writes:

[T]he easiest way of lowering unit costs is to spread the fixed element across a larger output . . . Management has pursued the maximum possible technical economies of scale in mine and metal production. New projects have been brought on stream at ever-larger initial throughput rates in order to exploit such economies to the full.

One corollary of reinvesting capital in increased production to cut costs is that dividend payments are withheld, affecting shareholder appetite for the mining industry. Another corollary of the cost cutting mentality is that mines have to operate at full or near full capacity in order to achieve their cost targets. But this means that negative social and environmental impacts associated with the industry are also maximized. And while the cyclical nature of commodity pricing has been used as an ‘alibi’ for low profitability, it has also been put forward as an impediment to adopting the values of sustainable development. The mining industry (so the argument goes) is already stressed by low commodity prices and low average rates of return on investment, and cannot afford the increased environmental and social costs that do not also lead to increased pro-

131 Stürmer (n 126) 2.
132 Ibid 2–3.
133 Crowson (n 111) 39. See for example praise for the latest costcutting measures of global seniors in PwC (n 122) 11.
134 Crowson (n 111) 39.
135 PwC (n 115) 17.
136 Ibid.
137 Ibid 38.
ductivity, such as costs associated with community programmes, reinforcing a tailings dam or sterilizing an ore body for environmental reasons.  

Rather than placing the blame for lacklustre industry profitability on exogenous factors such as project lead times, low barriers to market entry or commodity pricing, the question arises whether responsibility should not be laid at the door of industry players themselves, particularly for poor decisions to develop and acquire additional mineral-producing assets. In this regard, the strong cautionary tone of the 2018 PriceWaterhouseCoopers (PWC) review of the mining industry is interesting:

Perhaps the most significant risk currently facing the world’s top miners is the temptation to acquire mineral-producing assets at any price in order to meet rising demand. In the previous cycle, many miners eschewed capital discipline in the pursuit of higher production levels, which set them up to suffer when the downturn came. While we expect capital expenditure to increase next year as companies implement their longterm growth strategies, miners must be careful to maintain discipline and transparency in the allocation of capital. They need to resist the urge to pursue projects or acquisitions at any price, and instead, focus on mining for profit, not for tonnes.

These cautionary words from a mainstream, conservative organization fly in the face of older, entrenched views that mining is good for development and that mineral-rich developing countries must promote mining investment, as the narratives constructed in Chapter 2 demonstrate. They also fly in the face of the loud voices of recently elected, right leaning populist governments, such as those led by Trump in the USA and Bolsonaro in Brazil, who are riding a wave of nationalist sentiment with promises of increased support for the mining industry.

The caution against acquiring mining assets ‘at any price’ recognizes that short-run decisions in this vein are damaging to the industry itself. Of far greater importance is that in acquiring assets, mining companies impose costs on third parties – communities, Indigenous Peoples and the environment – where the ‘price’ involved may be survival itself. This places an even greater responsibility on the mining industry and host governments.

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139 Ibid 2.
140 PwC (n 122) 2.
141 This trend is further discussed in section 6.2 below.
4.5 Peak Minerals

Since the mid-2000s there has been interest in ‘peak minerals’, a metaphor that draws on the notion of ‘peak oil’. Some researchers have modelled peaks in resource production to determine when resource availability may decline. For example, in a recent contribution, Rustad applied Hubbert-style analysis used in the production history of oil to other raw materials. Relying on histories of production statistics, he found that many resources commonly thought of as being close to peaking (such as copper, the rare earth elements, lithium and helium) actually exhibited exponential growth in production.

This research supports the position that while lithographic stocks of minerals are undoubtedly finite, technology (allowing for increasingly efficient extraction of mineral commodities from lower grade ores) and prices (allowing for the extraction of increasingly remote and difficult to access reserves) can prolong resource accessibility. Some mineral-dependent jurisdictions have also prepared tables of the number of extractive years remaining for particular commodities, given known mineral reserves and current rates of production.

However, as Prior and others have pointed out, the ‘peak’ in peak minerals is unlikely to be associated with mineral stocks, at least viewed from a global perspective. Rather, peak production limits are more likely to be associated with social and environmental constraints. The key driver in this regard is the trend towards declining ore grade and quality.

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142 The work on peak oil stems from Hubbert’s modelling of oil production in 48 states in the USA (MK Hubbert, Nuclear Energy and the Fossil Fuels (Shell Development Co., Exploration and Research Division 1956). Hubbert predicted an oncoming oil production peak and coined the term ‘energy services’ as a means to conceptualize how such services could be met using alternative energy sources. See T Prior et al, ‘Resource depletion, peak minerals and the implications for sustainable resource management’ (2012) 22 Global Environmental Change 577, 578.

143 Prior (n 142) 578.


145 Ibid.

146 Prior (n 142) 577.


149 Ore grades signify both the concentration of a particular mineral or metal being mined, as well as the quality of the ore with respect of processing, such as whether it is
Australia, for example, has shown that the long-term trends for copper, nickel, gold, lead, silver and zinc ore grades are all declining.\textsuperscript{150} In the case of iron ore, Australia’s known reserves are increasingly composed of magnetite (which has 24 per cent iron in its natural formation), which requires more water and energy to extract and process as an export product than haematite (55–66 per cent iron in natural formation).\textsuperscript{151} Similarly, Australia has fairly large reserves of rare earth oxides, but these are locked away in the monazite component of heavy mineral sand deposits, which also contain thorium and uranium. The treatment costs associated with these byproducts currently make these reserves subeconomic to exploit.\textsuperscript{152} Internationally, gold ore grades have also constantly declined over the past 80 years.\textsuperscript{153} South Africa, for example, is estimated to have at least 30 years of gold production left (having been the world leader in gold production until 2009). However, most of the remaining gold is found in low grade or deep lying deposits.\textsuperscript{154}

Declining ore grades substantially increase the energy required for extraction and significantly heighten the pollution burden.\textsuperscript{155} The Australian Productivity Commission has also found that capital and labour inputs into the mining industry have risen as ore grades have declined.\textsuperscript{156} Pollution increases because as the ore grade declines, miners are forced to exploit economies of scale to meet demand and maintain the same unit costs of production.\textsuperscript{157} Social conflict fine or coarse, or contains impurities such as pyrite (see Prior n 142, 579). For a contrasting view see James West, ‘Decreasing metal ore grades: Are they really being driven by the depletion of high-grade deposits?’ (2011) 15(2) Journal of Industrial Ecology 165.

\textsuperscript{150} Prior (n 142) 580.
\textsuperscript{151} Mason (n 148) 963.
\textsuperscript{152} Prior (n 142) 579.
\textsuperscript{154} Neingo and Tholana (n 153) 284.
\textsuperscript{155} Prior (n 142) 580. Determining whether water usage also increases with decreasing ore grades is difficult. While water scarcity is certainly a production limitation for some commodities, water use varies at the mine level, across commodities and across companies, and reporting mechanisms are still too rudimentary to make largescale claims about the relationship between water use and declining ore grades (ibid). Nevertheless, there is some research that establishes this relationship (see GM Mudd, ‘Gold mining in Australia: Linking historical trends and environmental and resources sustainability’ (2007) 10 Environmental Science & Policy 629).
\textsuperscript{157} Prior (n 142) 581.
arises not only due to increasing environmental awareness and public concern, but also because exploiting new mineral deposits takes miners into more remote areas that impact high value agricultural, conservation or heritage-associated land.\textsuperscript{158}

While the concept of peak minerals has thus been squarely situated within a broader social and environmental context, the governance implications of this awareness have only been vaguely sketched. Prior \textit{et al}, for example, urge that addressing these constraints will require ‘innovative and proactive’ responses on the part of government and industry.\textsuperscript{159} From a government perspective, such innovative resource governance measures could include sovereign wealth funds or resource rent taxes.\textsuperscript{160} Emphasis is also placed on a proactive State, engaged in longterm planning that complements primary metal production with the development of secondary production capacity and investment in recycling and recovery technology, facilities and policy.\textsuperscript{161}

While global stocks of a particular mineral might be such that global supply will never be significantly threatened, for the State in which such reserve is situated the nonrenewability of the resource is of crucial importance, as mineral reserves can only be exploited once.

The focus of this section has been on the supply of mineral commodities. The following section draws attention to the ‘externalities’ of mining: impacts on environment, society and economy that would vastly reduce the profitability of mining for mining companies, their shareholders and mineral-rich jurisdictions, were there to be proper accounting of such.

5. GLOBALIZED IMPACT: THE UNEQUAL EFFECTS OF FORMAL MINING ON ENVIRONMENT, SOCIETY AND ECONOMY

Mining has far reaching, and oftentimes irreversible, impacts on the environment, society and economy of localities, regions, the nation State and even the globe. As the chains of mineral commodity production have become increasingly integrated and global in their reach, more and more communities and organizations have voiced resistance to mining on the basis that the industry’s externalities are unsustainable and unequally distributed.

The extractives industry itself has acknowledged that it is one of the primary causes of environmental degradation and human-induced climate change

\textsuperscript{158} Ibid 581–2.
\textsuperscript{159} Ibid 583.
\textsuperscript{160} Ibid 585.
\textsuperscript{161} Mason (n 148) 964.
worldwide.162 *Breaking New Ground* was frank in this regard: ‘It is hard to argue that mineral extraction, processing, and use generally benefits the local ecosystems concerned or makes them more productive. Overall the ability of local ecosystems to provide biological benefits has often been seriously impaired by mining and mineral processing.’163

Environmental concerns relating to mining include mechanical damage of the landscape, loss of biodiversity, acid mine drainage (AMD), extensive mine wastes and tailings, gaseous (CO₂, NOₓ, SO₂) and particulate matter emissions and metal contamination of soils and waters.164 The World Economic Forum estimates that the mining and metals industry is responsible for between 40 and 55 per cent of permanent waste generated annually – some 10 billion tonnes per year. The industry is therefore among the world’s ‘great generators of waste’.165 Societal impacts include a range of occupational and community health impacts, relocations, loss of livelihoods, gravesite relocations, social conflict and social decay. Proliferating forms of environmental and social assessment (canvassed in Chapter 6) have been developed to identity, avoid and/or mitigate these intersecting and cumulative impacts. Precautionary assessment of economic impacts is comparatively undeveloped, notwithstanding accepted explanations for ‘Dutch Disease’ and the resource curse.166

The distribution of environmental and social impacts is unequal, as illustrated by initiatives such as the European Commission-funded Environmental Justice, Liabilities and Trade (EJOLT) project.167 The EJOLT project produced a database of resource conflicts along global production chains for a variety of commodities, including minerals. The Environmental Justice (EJ) Atlas includes hundreds of case studies where Indigenous Peoples and grassroots community-based organizations are resisting mining, often over a number of years. The ‘Mineral Ores and Building Materials Extraction’ category in the EJ Atlas shows a preponderance of these conflicts in South America, middle America, Africa, Eastern Europe, and South-East Asia. Other networking platforms, such as ‘Mines and Communities’ (MAC),168 allow hundreds of indigenous and solidarity NGOs to recount the stories of individuals and

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163 *Breaking New Ground* (n 81) 232.
166 These concepts are discussed in section 2 of Chapter 3.
organizations battling against mining-related ventures. The MAC website specifically intends to expose the social, economic and environmental impacts of mining.169

How can these impacts be measured? Moving beyond conventional measures of economic performance, in natural resource accounting, Adjusted Net Saving (ANS) has been developed as a broader, longrun indicator of the economic, ecological and educational wealth of nations. ANS is a measure that subtracts from national income the consumption of fixed capital (wear and tear of machines), adds educational expenditure, subtracts the depletion of nonhuman capital and adds the costs of pollution.170 Published under the auspices of the World Bank Group, a report on *The Changing Wealth of Nations* is the most recent global review of ANS.171 The findings of this report highlight that the level of a country’s economic development is strongly correlated to the composition of its national wealth. Natural capital, inclusive of mineral resources, is one form of national wealth; however, it is the largest component of wealth in low income countries, whereas in lower middle income countries it accounts for a quarter of wealth.172 ‘Getting rich’, the report emphasizes, ‘is not about liquidating natural capital to build other assets’.173 Growth that leads to wealth rather than spikes in current income (as measured by GDP) ‘is in part about more efficient use of natural capital and investing the earnings from natural capital sources, such as minerals, into infrastructure and education’.174 The extraction of nonrenewable natural capital such as minerals offers a ‘one-time chance’ to finance development. The report continues:

> Nearly two-thirds of countries that have remained low income since 1995 are classified as resource-rich, or fragile and conflict states, or both. This shows that resources alone cannot guarantee development: strong institutions and good governance are needed to ensure that rents are invested and not used entirely for consumption.175

Applied to Africa, even the most rudimentary analysis of ANS is devastating. *The Changing Wealth of Nations* observes that sub-Saharan Africa

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172 Ibid 2.
173 Ibid.
174 Ibid.
175 Ibid.
Introduction

loses roughly US$100 billion of ANS annually (excluding the platinum and diamond sectors). Averaging negative 3 per cent of gross national income over the period 1995–2014, it is the only region of the world with negative levels of ANS, with natural resource depletion being one of the key drivers.\(^{176}\)

As noted in section 1 above, extractivist and neoextractivist approaches alike have rejected ecological limits to extractives-fuelled economic growth, minimized the impacts of the extractive industries or argued that losses can be compensated for economically. Specifically, the pro-mining discourses outlined in Chapter 2 either explicitly hold or assume that environmental, social and economic externalities are local, temporary or reversible; or argue that impacts can be managed or mitigated through good governance, strong State regulation and better technology; or accept the damage inflicted upon people and planet as a necessary sacrifice. Mining advocates have faith in proliferating forms of environmental and social assessment as instruments of precaution and environmental managerialism that can be used to identify, avoid or mitigate ‘impacts’. Purveyors of the discourses of mining dissent outlined in Chapter 3, however, dispute the effectiveness of these tools and argue that mining and mineral processing inflict longterm and potentially irreversible changes to ecological, social, economic and cultural systems.\(^{177}\)

The recognition of ecological and social limits to growth is integral to the nascent paradigm of postextractivism. Recognition of such limits is not new. In the early 1970s, the Club of Rome’s *Limits to Growth* report sparked controversy by suggesting that the limits to growth would be reached sometime within the ensuing 100 years, and that the probable result would be a ‘rather sudden and uncontrollable decline in both population and industrial capacity’.\(^{178}\) The report considered the exploitation of nonrenewable resources in the context of global growth trends, and attempted to determine when the world would run out of major minerals given exponentially increasing rates of use and known reserves.\(^{179}\) The *Limits to Growth* report was attacked from all sides of the political spectrum, including by scholars and activists in developing countries who took the position that the consumption of material goods and economic growth could be made compatible with the environment.\(^{180}\)

\(^{176}\) Ibid 63.


\(^{179}\) Ibid. See the analysis at 54–69.

\(^{180}\) Gudynas (n 23) 18–19.
More recent work on socioecological limits focuses on the integrity of Earth system processes (‘planetary boundaries’) rather than global growth trends, and on determining a ‘safe operating space for humanity’ rather than points of ultimate collapse. As laid out in a groundbreaking 2009 paper by Rockström and 28 colleagues, planetary boundaries index key, interlinked Earth system processes and their associated thresholds, which if exceeded could generate unacceptable environmental change. Planetary boundaries are essentially values for control variables associated with each of these processes, such as atmospheric carbon concentration and change in radiative forcing as control variables for climate change, or the consumption of freshwater by humans (measured in km$^3$ per year) for global freshwater use. In this first presentation of the planetary boundaries concept, Rockström et al suggested that the thresholds for three of the Earth system processes – climate change, biodiversity loss, and interference with the nitrogen cycle – had already been breached, while the boundaries for freshwater use, change in land use, ocean acidification and interference with the global phosphorous cycle were fast approaching. If allowed to continue, the authors warned, these trends and rates of change would significantly erode the resilience of major components of Earth system functioning, with dire consequences for our capacity to pursue longterm social and economic development. In an update to the planetary boundaries framework published in January 2015, the authors suggested subglobal boundaries for those Earth system processes with strong regional operating scales, and identified two core boundaries, namely climate change and biosphere integrity (or rate of biodiversity loss). They also recognized that different human societies and social groups had unevenly contributed to the current levels of control variables and transgression of boundaries, and that the notion of a ‘safe operating space for humanity’ and the definition of the thresholds was not in itself helpful to determine how to move within the safe operating space, where pressure on the boundaries needs to be released, by whom and how quickly.

181 Johan Rockström et al, ‘A safe operating space for humanity’ (2009) 461 Nature 472. Nine such Earth system processes were identified: climate change; rate of biodiversity loss (terrestrial and marine); interference with the nitrogen and phosphorous cycles; stratospheric ozone depletion; ocean acidification; global freshwater use; change in land use; chemical pollution; and atmospheric aerosol loading.

182 Ibid 473.

183 Ibid.


185 Ibid.
The planetary boundaries framework has also been criticized on the basis that it affords insufficient attention to social boundaries. In an Oxfam discussion paper entitled ‘A safe and just operating space for humanity’, Raworth took up the challenge of complementing planetary boundaries with the concept of ‘social boundaries’. This leads to a graphic conceptualization of a safe and just operating space as a ring-shaped doughnut, with an environmental ‘ceiling’ and a social ‘floor’. The social floor is not a given but captures those needs and claims to goods which a broad spectrum of people in society agree should be satisfied. There are various sources of such consensus. International human rights have long supported the fundamental moral claim to ‘essentials’ such as food, water, healthcare, education, political participation and personal security. Bills of Rights, at the national or subnational level, provide a further indication of a particular society’s priorities in setting the social floor. Internationally, the 2000 Millennium Development Goals (MDGs) expand upon the list of potential deprivations that would cause individuals and groups to drop below the social floor. Further, since the Rio+12 conference in 2012, extensive effort is now being put into implementing the Sustainable Development Goals (SDGs) that address emerging concerns around social protection schemes, the need to provide decent work for a rapidly growing global workforce, electrification, combating extreme inequality and ensuring people’s empowerment in the political and economic processes that affect their lives. To a certain extent, recognition of these rights and goals allows the social floor to be quantified and for progress to be chartered over time.

Apart from the mining of phosphorous (implicated in one of the recognized Earth system processes), a comprehensive analysis of the impact of mining on planetary or social boundaries has not yet been attempted. Superficially, and given the scale of contemporary mining, it is reasonable to assume that mining is at least contributing to climate change, biodiversity loss, freshwater use, change in land use, chemical pollution and atmospheric aerosol loading. A systematic analysis of the relationship between mining and social boundaries is also largely lacking, notwithstanding numerous reports on the impact of mining on Indigenous Peoples, environmental justice and human rights.

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188 These include eradicating hunger and extreme poverty; achieving universal primary education; promoting gender equality and women’s empowerment; reducing child mortality; improving maternal health; combating HIV/AIDS, malaria and other diseases; and extending access to water and sanitation.
189 See the indepth analyses in Chapter 3.
6. BRINGING THE STATE INTO VIEW: MARKET SOCIETY AND THE ‘DOUBLE MOVEMENT’ FROM POLANYI TO THE PRESENT DAY

Taking all elements of the foregoing discussion into account – trends in demand, the dynamics of formal mining and the extent and distribution of environmental, social and economic impacts – the central questions are: What are the dynamics that keep the current system in place? Who influences the ways in which the costs and benefits of the mining industry are constituted and distributed? What are the forms and extent of their powers? Is the current system sustainable? What are the alternatives? These questions can be answered from numerous vantage points – those of consumers of mineral commodities, consuming countries, mining companies, investors, financing institutions, international financial organizations, Indigenous Peoples’ organizations, community-based organizations and national and international NGOs.

The focus of this book, however falls on the State. This focus is justified because a range of pro- and anti-mining discourses vest the State with agency to promote and facilitate mining production and ensure that its worst environmental, social and economic impacts do not materialize. As is evident from the detailed exposition of mining discourses in Chapters 2 and 3, a range of actors make extensive and diverse demands on the State in relation to mining, development and sustainability, either couched positively in terms of what the State should be doing, or negatively in terms of what the State is failing to do. This positions the State as a mediator of conflicting interests, a key actor in distributing the costs and benefits of mining in a manner that advances the greater good.

This framing of the State is not new and was not formed in the crucible of mining-related conflict. In his 1944 work *The Great Transformation*, Polanyi was already able to apprehend the State as a site of paradox, steering multiple, conflicting social forces in a manner that locked the hegemony of market society into place. The thesis of the current book is that the contemporary State constituted by multiple mining narratives plays the same role.

6.1 Polanyi’s Market Society and the ‘Double Movement’

In *The Great Transformation*, Polanyi meticulously outlined the tumultuous changes that were necessary to effect the shift from a traditional to a market society. Polanyi challenged the idea that markets, based on a ‘natural’ economic psychology of barter and trade, were central to the functioning of society. On the basis of extensive historical evidence, Polanyi argued that while the institution of the market had been fairly common since the Stone
Age, no economy controlled by markets had existed before the nineteenth century.\textsuperscript{190}

No society could, naturally, live for any length of time unless it possessed an economy of some sort; but previously to our time no economy has ever existed that, even in principle, was controlled by markets. In spite of the chorus of academic incantations so persistent in the nineteenth century, gain and profit made on exchange never played an important part in human economy.\textsuperscript{191}

Polanyi’s second thesis was that extensive State intervention was needed to maintain the market economy and market society. By market economy he meant ‘an economic system controlled, regulated, and directed by market prices’,\textsuperscript{192} to which the production and distribution of goods was thereby also entrusted; by market society he meant the embedding of social relations within the market rather than the other way around, ‘the running of society as an adjunct to the market’.\textsuperscript{193} The ‘gearing of markets into a self-regulating system of tremendous power’, Polanyi argued, ‘was not the result of any inherent tendency of markets towards excrescence, but rather the effect of highly artificial stimulants administered to the body social’.\textsuperscript{194} These stimulants were applied by newly constituted, centralized nation States in Western Europe and England.\textsuperscript{195} Rather than the idea that markets are somehow natural, or stable, Polanyi showed that they were fragile and disaster prone, lurching from one crisis to another, as amply demonstrated in our time through the 2008 financial crisis.\textsuperscript{196}

Market economies and market society required the imposition of rules (on enclosures – protectionism) backed by State-imposed violence.\textsuperscript{197} They also required the fictitious commoditization of labour, land and money. The market mechanism needed to apply not only to the products of industry, but also to its chief elements. This had further implications for the State and its policy, as Polanyi pointed out, as the State had to assume the additional role of ensuring that no measure or policy countenanced the operation of market mechanisms for labour, land and money. In contemporary mining conflicts, the State’s role

\textsuperscript{190} Polanyi (n 32) 45.
\textsuperscript{191} Ibid.
\textsuperscript{192} Ibid 71.
\textsuperscript{193} Ibid 60.
\textsuperscript{194} Ibid.
\textsuperscript{195} Ibid 69.
\textsuperscript{196} Zaman (n 33) 125.
in ‘modernizing’ indigenous land title, or failing to protect customary title to land, illustrates the continuing relevance of this insight.

However, the commoditization of land, labour and money necessary for the functioning of the market economy presaged the demolition of society. As Polanyi insisted:

But labor, land and money are obviously not commodities; the postulate that anything that is bought and sold must have been produced for sale is emphatically untrue in regard to them . . . Labor is only another name for human activity, which goes with life itself, which in its turn is not produced for sale but for entirely different reasons, nor can that activity be detached from the rest of life, be stored or mobilized; land is another name for nature, which is not produced by man (sic); actual money, finally, is merely a token of purchasing power which, as a rule, is not produced at all, but comes into being through the mechanism of banking or state finance. None of the them is produced for sale. The commodity description of land, labor and money is entirely fictitious.

The fictitious commoditization of land, labour and money causes tremendous damage to society, which continues to this day.198 Poignantly, commenting on the commoditization of land, Polanyi prognosticated that nature would be ‘reduced to its elements, neighbourhoods and landscapes defiled, rivers polluted . . . the power to produce food and raw materials destroyed’.199 Equally poignantly, in regard to human beings, he said: ‘Robbed of the protected covering of cultural institutions, human beings would perish from the effects of social exposure; they would die as the victims of acute social dislocation through vice, perversion, crime and starvation.’200

The next element of Polanyi’s thesis was that people would dismiss market mechanisms if they had full rein. Because no society could stand the ‘ravages of this satanic mill’ for the shortest time, contending social forces fought against the imposition of market mechanisms, to protect both the business organization of society and its human and natural elements.201 Ultimately, however, the balance of contending forces needed to play out in a manner that still secured the supremacy of the market economy.

Polanyi illustrated eighteenth century society’s ‘unconscious resistance’ to being an appendage of the market through his discussion of the ‘Speenhamland law’, an enactment that suspended the creation of a market for labour in England for a brief time at the turn of the nineteenth century.202 The popular

198 Zaman (n 33) 124.
199 Polanyi (n 32) 76.
200 Ibid.
201 Ibid 77.
202 Ibid.
Speenhamland law was supposed to guarantee a basic income to the poor without conditions. But since the market system had already become fairly entrenched, and land enclosures prevented a return to premarket ways of life, it contributed to their pauperization instead.\(^{203}\) The failure of the Speenhamland episode framed the sensibilities of many of the nineteenth century Western thinkers who laid the ideological groundwork for the market society, convincing them that no alternative could exist to the wholesale commodization of labour in service of the market.\(^{204}\) It also set the tone for the paradox that continues well into the twenty-first century: the side-by-side existence of extreme plenty and extreme poverty, and with that, forces that seek to continue, deepen and extend market society and forces that fight for society’s self-protection.\(^{205}\) The tension between these forces has not yet reached its apex, and each holds the other in place.

For Polanyi, the State was the site of paradox through which both ‘organizing principles of society could be expressed’. He termed this the ‘double movement’ and described it thus:

\[
\text{[T]he action of two organizing principles in society, each of them setting itself specific institutional aims, having the support of definite social forces, and using its own distinctive methods. The one was the principle of economic liberalism, aiming at the establishment of a self-regulating market, relying on the support of the trading classes, and using largely \textit{laissez-faire} and free trade as its methods; the other was the principle of social protection aiming at the conservation of man and nature as well as productive organization, relying on the varying support of those most immediately affected by the deleterious action of the market . . . and using protective legislation, restrictive associations, and other instruments of intervention as its methods.}\(^{206}\)
\]

Essential to the idea of the double movement is that it is the contention between these principles that assures the hegemony of the market economy and market society, albeit in milder forms than would otherwise hold sway if market mechanisms were allowed free rein.

\section*{6.2 Polanyi’s Ideas in Our Time}

Are Polanyi’s ideas regarding the market economy, market society, State violence in the service of upholding economic systems, commoditization of the factors of production and the double movement still pertinent in our time?

\(^{203}\) Zaman (n 33) 139.
\(^{204}\) Polanyi (n 32) 84, 88.
\(^{205}\) Ibid 87.
\(^{206}\) Ibid 132.
Polanyi believed that the Second World War predicated the demise of market society.\[^{207}\] What transpired instead in some of the most developed countries of the world was 30 years of Keynesian economics, which took labour out of the sphere of self-regulation. According to Zaman, ‘[m]any analysts have said that Keynes saved the market economy by making the smallest possible alteration that would make it possible to live with’.\[^{208}\] During those same 30 years, communist, socialist and nationalist sentiments in developing countries fuelled the nationalization of foreign and privately owned industries, including a number of mines.\[^{209}\]

Polanyi’s warnings regarding the market economy and market society are still clearly relevant in contexts where free markets are unabashedly being promoted. Even while Keynesianism reigned, free market ideologues collaborated with State agencies and corporations to intentionally transfer free market ideas from one nation to another. In the USA, the most extreme form of free market capitalism was associated with Milton Friedman and the Chicago School of Economics, and the first intentional and violent transfer of these ideas occurred in Chile.\[^{210}\] International aid organizations,\[^{211}\] as well as large corporations, funded the training of intellectuals to believe in free markets as the solution to all social problems.\[^{212}\] For example, army leaders from South America were trained at the ‘notorious’ School of the Americas to believe in both capitalism and the violence and ruthlessness required to impose capitalistic policies on a resistant population.\[^{213}\] General Pinochet was among these leaders and he used force to impose Chicago School economics in Chile, pursuing a ‘revolutionary project’ that ‘propounded economic and market solutions for practically all problems in society’\[^{214}\] – this notwithstanding that the economic costs would be borne by the poorest and least sheltered sectors of Chilean society.\[^{215}\]

Under Pinochet’s rule, Chile became the poster child for liberal reforms in the mining sector, ostensibly necessary to promote investment and stem poverty. As detailed in Chapter 2, IFIs and the mining industry subsequently used the Chilean model to advocate for similar mining policy and law reforms all over

\[^{207}\] Zaman (n 33) 124.
\[^{208}\] Ibid 143.
\[^{209}\] See section 4.2 above.
\[^{210}\] Friedman’s ideas and the intentional transfer of Chicago School economics to Chile are documented in Naomi Klein, *The Shock Doctrine* (Picador 2008) 59.
\[^{211}\] An example would be the United States Agency for International Development’s ‘Chile Project’. See Juan Gabriel Valdés, *Pinochet’s Economists: The Chicago School in Chile* (Cambridge University Press 1995) x.
\[^{212}\] Zaman (n 33) 143.
\[^{213}\] Ibid.
\[^{214}\] Valdés (n 211) xi.
\[^{215}\] Ibid.
the developing world. However, even at the height of its experiment with free market fundamentalism, Chile did not privatize the State-owned copper mining company Codelco, which had previously been nationalized by Allende. This was the ‘only thing’ that saved Chile from complete economic collapse in the early 1980s and ensured the State had a steady flow of funds.\textsuperscript{216} Codelco remains a State-owned mining company to this day and is amongst the largest copper companies in the world, producing roughly 1.8 million metric tonnes of refined copper in 2017 – 11 per cent of the global total.\textsuperscript{217}

At the time of writing, a virile form of free market ideology is on the rise again. Two figures represent this form of free market fundamentalism in the developed and developing worlds, respectively: Donald Trump in the USA, and Jair Bolsonaro in Brazil. Both leaders have been elected to office on the basis of a populist wave of economic and social discontent centred on job insecurity, debt vulnerability, deindustrialization and fear of migration and crime.\textsuperscript{218} Both leaders are also advancing a nationalist form of economic liberalism – the first arm of Polanyi’s double movement. Trumponomics, for example, has been described as a ‘21st-century version of Reaganomics’ which aims to lower individual and corporate taxes, increase spending on military and physical infrastructure, further deregulate private activity and reduce protections for labour and the environment.\textsuperscript{219} Bolsonaro is a far right politician who has appointed a rightwing, University of Chicago-trained banker as his chief economic adviser. This has been taken as a sign that the Brazilian President ‘will embrace the neoliberal consensus that investors have been pressurizing Brazil to execute’.\textsuperscript{220} On issues of environmental concern, both leaders have caused alarm. Trump is a climate change denialist who has withdrawn the USA from the Paris Agreement. A key element of his ‘America First’ campaign is to ‘reorient’ American environmental and energy policy and do away with ‘job-killing’ environmental regulations.\textsuperscript{221} Bolsonaro has

\textsuperscript{216}~Klein (n 210) 104.
\textsuperscript{218}~Jamie Morgan, ‘Trumponomics: Everything to fear including fear itself?’ (2017) Issue No. 78 Real World Economics Review 3, 7. Both leaders are also notorious for their misogynistic, racist, pro-gun and homophobic attitudes.
\textsuperscript{219}~Jayati Ghosh, ‘Trumponomics and the developing world’ (2017) 79 Real World Economics Review 29; Morgan (n 218) 3.
\textsuperscript{221}~Morgan (n 218) 12.
been described as having a ‘love affair’ with mining and a desire to unleash the mining potential of the 1.7 billion-acre Amazon rainforest.\footnote{Bloomberg News, ‘Amazon’s mining treasure at stake as Bolsonaro leads Brazil vote’, www.mining.com/web/amazons-mining-treasure-stake-bolsonaro-leads-brazil-vote-2/ accessed 21 February 2019.} In line with the play of social forces under a global market economy, one can expect contending social forces to push back strongly against the dynamics that Trump, Bolsonaro and others are unleashing.

Polanyi’s model, however, is also relevant in contexts where free market reforms aimed at stimulating the extractive industries have been seriously questioned. This is the case where States are more assertive and interventionist under the banner of neoextractivism. The thinking of Keynes and his compatriots fuelled ‘development thinking’ for the ‘underdeveloped’ regions of the world in the postwar period, and it was believed that conventional growth models would solve the problems of poverty and inequality.\footnote{Gudynas (n 23) 16.} Beginning with the dependency theorists in the 1960s, critique of the relationship between development and extractive-led economic growth has waxed and waned. In Latin America, periods in which neoliberalism has held sway have alternated with periods in which neoliberal reforms have been halted, and the onward march of the market checked.\footnote{Ibid 17ff.} But as Gudynas has argued, in a number of respects the assumptions underlying a neoextractivist approach are no different from extractivism. These include the belief in progress, development, the importance of exports and investments in extractives and the appropriation of nature.\footnote{Ibid 24.} While they may tinker with the detail, neoextractivist governments do not fundamentally eschew the market economy or market society, because they remain embedded in a global system of production organized along these lines.

The voices of the 1960s and 1970s that argued for natural resource use to fuel development in the underdeveloped regions echo through a figure such as Tanzania’s president, John Magafuli. Magafuli came to power in November 2015 and almost immediately attracted attention for his strong stance against corruption. He also gained fame/notoriety for an extended confrontation with multinational mining companies, after it was discovered that a subsidiary of a Canadian multinational had allegedly been underreporting mineral exports and thus depriving the Tanzanian State of mineral revenues.\footnote{Dan Paget, ‘Magafuli has been president for two years: How he’s changing Tanzania’ The Conversation, 2 November 2017.} This altercation has led to some of the most far-reaching taxation reforms ever pursued in a devel-
oping country. Magafuli’s economic policies rest on enabling intraregional trade, facilitating increased industrialization and – most significantly – capitalizing on the country’s natural resources. As a commentator observes, Magafuli ‘appears keen to distinguish his presidency by harnessing Tanzania’s resources to fuel economic growth’. 227 Magafuli is no different to Trump or Bolsonaro in using the State mechanism to promote mining, commoditize nature and deliver mineral commodities to a global system of mineral production where the market determines the price.

Polanyi restricted his conception of the double movement to a State apparatus that promoted economic liberalism. He also insisted that, contrary to conceptions of laissez-faire, market economies and market society require significant State intervention to guarantee sustainability. This form of State intervention differs from that required by neoextractivism, but the end goal (promoting mineral extraction) and even some of the means (commoditizing nature, allowing social relations to be determined by the dictates of the market) are the same.

The Second World War was the crisis Polanyi invested with the potential to break market society. The existential crisis of this time is climate change, and the potential it holds to trigger broadscale, far-reaching and irreversible shifts in social and ecological systems. The latest report of the Intergovernmental Panel on Climate Change (IPCC) warns that limiting greenhouse gas emissions pathways to 1.5°C would require ‘unprecedented’ systems transitions that lead to deep emissions reductions in all sectors. 228 The IPCC also warned that currently stated national mitigation ambitions would not lead to the emissions cuts necessary to avoid overshooting global warming of 1.5°C by 2030, and that global emissions reductions would need to start declining well before this time. 229 Whether the current generation will be able to rise to this challenge, and whether the current crisis will fundamentally transform market economies, market society and the double movement in mineral production, are matters worthy of serious consideration.

7. AIM AND STRUCTURE OF THIS BOOK

This book uses the conceptual framing of Polanyi’s ‘double movement’ to explicate the paradoxical role of the State in energy and hardrock mining in the

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229 Ibid 20.
era of the Anthropocene. It aims to demonstrate the patterning of State roles that orbit around promoting mining on the one hand, and protecting society from the industry’s worst environmental, social and economic effects on the other. It adds meat to understanding how the State advances extractivism and neoextractivism as governance paradigms that continue to externalize these costs. It gestures towards a postextractivist world, but largely in the sense of identifying what needs to be undone.

To illustrate the State’s double movement, the book focuses on four areas of policy, law and governance: property, taxation, environmental assessment, and mine closure. These areas of policy, law and governance constitute the double movement, but in different ways, as subsequent chapters elaborate. For each of these four areas, this book presents the patterning of State roles that give effect to the double movement. The analysis is based on the policies and laws of mineral-rich jurisdictions and the advocacy of IFIs, global and national mining industry associations, Indigenous Peoples’ movements, national and international NGOs and academia. These analyses are set out in Chapters 4 (The State, Mining and Property Institutions), 5 (The State, Taxation and Mining), 6 (The State, Mining and Environmental Assessment) and 7 (The State and Mine Closure), respectively.

To frame these analyses, the book also delineates the key narratives or ‘discourses’ reflecting and constituting current understandings of the relationship between mining, development and sustainability. The ‘pro-mining’ discourses outlined in Chapter 2 provide an enriched understanding of extractivism and neoextractivism by distinguishing four narratives (the sustainable mineral development consensus, responsible mining, neoextractivism and critical and strategic minerals) and demonstrating the differentiated demands made of the State under each. Chapter 3, on ‘discourses of dissent’, does the same in respect of the resource curse theory, Indigenous Peoples’ rights, human rights theories, environmental justice and feminist theories of mining.

An attempt has been made to refer to mineral policies and laws from mineral-rich jurisdictions the world over. Mining takes place in many places but States are differentiated by their dependence on mineral commodities for export earnings, foreign direct investment and national income. For the most part, the examples in this book are drawn from countries ranked highly on the ICMM’s ‘Mining Contribution Index’ (MCI), that is, jurisdictions in which mining makes a significant contribution to the national (or subnational) economy. Two limitations must nevertheless be acknowledged. As the author is

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230 The ICMM has investigated the role of mining in national economies which revolves around the idea of a Mining Contribution Index (MCI). For the latest explanation of the MCI see International Council of Mining and Metals, Role of Mining in

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not literate in the languages of Spanish or Portuguese, examples from South American jurisdictions are limited, reliant upon where the author could source legislation or case studies in English. Second, examples from the author’s home jurisdiction of South Africa may be over-represented.

The book opts for a discursive theory of the State. There are many theories of the State, spanning Marxist, Statist, feminist and Foucauldian accounts. Discourse-analytic work challenges the idea that the State is a distinct material entity or agent capable of independently intervening in society. Rather than a single ‘State’, there are only ideas of the State, produced by particular interest groups at particular times (a ‘stateless’ theory of the State). Discourse refers to the relatively durable social structuring of language, which is in turn one element of the relatively durable structuring and networking of social practices. Discourses are powerful because inasmuch as they reflect how we understand the world, they also reconstitute that world, reproducing perceptions of persons, social relations, action and interaction and our grasp of the material world in a particular way. While any one particular discourse may represent the State as a distinct, material entity responsible for particular roles, or capable of certain misdemeanours, the plurality of State discourses exposes this as an illusion. The plurality of discourses relating to the State, mining, development and sustainability emerges not only at the level of macro level policy debates, as canvassed in Chapters 2 and 3, but also at the level of meso level policy debates on property, taxation, environmental assessment and mine closure, as presented in Chapters 4–7. The argument of the book nevertheless remains that the apparently confusing plurality of State roles gives effect to an overarching ‘State’: that of the double movement, which locks mining in the Anthropocene into a mould that continues to externalize mining’s environmental, social and economic impacts.

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**National Economies** (3rd edn 2016) 18ff. The MCI is a measure of the significance of mining in a national economy and is derived from a number of indicators: the total contribution of mining to export earnings, the extent to which mining’s contribution to export earnings changed in the preceding five years, the value of mineral production expressed as a percentage of GDP and mineral rents as a percentage of GDP.

231 For a fairly recent account of West European and North American developments in theorizing the State, see Bob Jessop, ‘Bringing the State back in (yet again): Reviews, revisions, rejections, and redirections’ (2001) 11(2) International Review of Sociology 149.

232 Ibid 161.