Natural resources, nationalism, and nationalization

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Synopsis

This paper traces the rise of South Africa's mining industry in the context of the different state forms that oversaw its development. It commences with the mining-led industrial revolution through four periods of conflict, each of which contributed to a deepening of the industrial base, with constant battles between domestic and foreign capital and labour, and the rise of both Afrikaner and African nationalism. The role of state-owned enterprises has been crucial in shaping this dynamic so that at its peak the public sector and leading mining houses constituted two massive centres of power. This was followed by a thirty-year period of neo-liberal experimentation. The current debate on the 'developmental state' is an attempt to reconstruct the state as a counterweight to capital. It is argued that while the country has moved toward inclusive political and economic institutions, these are both limited by deep 'extractive' characteristics. This transformation failure provides a fertile ground for populism that presents one of the biggest threats to inclusive growth. Cited examples point to the many ways that states have sought to deal with the bonanza that conversion of mineral non-resources into resources brings. Such greenfield resources on state land, or in areas where the state holds monopoly rights, do not present ownership issues. It is suggested that this is the route that South Africa should follow, as the alternative will be conflictual.

Keywords

extractive political and economic institutions, resource nationalism, mining, apartheid, nationalization.

The political economy of the mining industry

Mining is synonymous with South Africa's industrial revolution, which dates from the last quarter of the 19th century and which laid the basis for the South African state of today.

Capital and skills flowed into the diamond fields and then the gold mines in the Zuid Afrikaansche Republiek, whose Boer population began to feel threatened by the foreigners, or 'uitlanders.' Contest for the control of the gold mines then triggered the Anglo-Boer South African War of 1899–1901, which unified the country under the British Crown. After the establishment of the Union of South Africa in 1910, state, labour and capital battled for economic and political control. The battle between nationalism and capital endures to the present.

The Botha-Smuts South African Party government led the country after Union, and demonstrated a pro-mining capital attitude. Subsequent to the 1922 Rand Revolt, white labour in 1924 made common cause with Herzog's National Party to form the Pact Government. Capital-labour antagonisms were resolved through further institutionalization of racial discrimination.

The Pact Government then carried on with the modernization programme of the South African Party government, which between 1910 and 1924 had laid the basis for the future 'apartheid developmental state.' Key elements of that developmental state* were the founding of South African Railways and Harbours (1916) and the Electricity Supply Commission (1923). The Herzog administration in turn established the Iron and Steel Corporation (1928), and in the wake of the Carnegie Commission, sought to address white poverty through public works programmes such as the Vaal-Hartz Irrigation Scheme (1934).

The Second World War ushered in a War Government under Smuts that promoted the deepening of industry, including the founding of the state-owned Industrial Development Corporation (1940), which was intended to counterbalance the power of the mining houses. All this was accomplished on the back of cheap and marginalized black labour.

*Antony Butler refers to an 'Afrikaner welfare state

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In 1944 the emergence of the militant African National Congress Youth League brought the first skirmishes of the civil war to come.

Then in 1948, Smuts lost power to the 'purified' Nationalists, who set about a rigorous codification of apartheid, complete with large-scale forced removals. The apartheid developmental state in turn diversified industry yet further by founding the Atomic Energy Board (1948), synthetic fuels producer Sasol (1950), and the Armaments Production Board, forerunner of Armscor (1960).

The 1960 declaration of the Republic of South Africa and subsequent 1961 state of emergency, coupled with rigid controls of outward capital flows, did little to cool the economy, which saw growth of up to 8% as labour productivity on the gold mines improved, and new markets, especially in the Far East, were opened (Feinstein, 2005). One such market was iron ore for Japan, which later saw ISCOR commission the Saldanha-Sishen railway line, which even today remains a significant technological achievement, with trains up to 4 km in length, the longest in the world, whose ten locomotives are synchronized through radio-distributed power technology. The same year saw the commissioning of the Richards Bay port and coal terminal, still the single largest such terminal in the world. Among electricity utilities, Eskom was also among the world's largest networks and a pioneer in extreme high voltage transmission and lightning protection. Until 2008, Eskom supplied the world's cheapest electricity to the mining and metal refining industries.

But one must pause to note the ending of the gold standard in 1970; the rise of worker militancy; the oil crises of the 1970s; the collapse of the Portuguese empire in 1974; the curtailment of migrant labour from Angola, Mozambique, and Malawi; the 1976 Soweto revolt; and the 1979 Iranian revolution. The State, burdened with the cost of the Bantustans and runaway arms expenditure, began to shift economic direction. Faced with oil sanctions, it was decided to raise Sasol's output tenfold, and to finance this through the floating of the company of the Johannesburg Stock Exchange.

1970 was the year of peak gold output, with refined output of 1000 tons. Employment on the mines from then grew to a peak in the mid-1980s after which it declined by nearly half (Figure 1), as new technologies, deeper mining, and the steep rise in real wage levels saw technology substitute for labour.

Arguably, the political economy of South African mining overlaps with the political economy of mining in the sub-equatorial region, given that prior to the independence of the various colonial dependencies Anglo-American, the largest of the South African mining houses, was active in mines in South-West Africa, Southern and Northern Rhodesia, and Tanganyika. Crucially, however, the diamonds of Botswana and Rhodesia then lay undiscovered. Had Rhodes known about them it is likely that today's South Africa would cover the entire area south of the Zambezi, including those two former Crown possessions.

By the mid-1980s Anglo American's domestic interests spanned mining, banking, insurance and leisure, agribusiness, motor vehicles, and forestry, with controlling interests in more than 1000 companies. In 1987 its aggregated market capitalization amounted to 60.1% of the Johannesburg Stock Exchange, with numerous publicly listed companies under its control, the next largest controlling interest being that of Sanlam at 10.7%, followed by SA Mutual at 8%, and Rembrandt with 43% (McGregor *et al.*, 2008).

The rise of the mining house oligopolies had concerned the government of the day, which in turn sought to limit such perceived excess through the 1955 Regulation of Monopolistic Conditions Act, amended and extended in 1979 as the Maintenance and Promotion of Competition Act, and again in 1986 to strengthen the Competition Board.†

Beyond this intense private sector concentration stood the state, with its control over the utilities, iron and steel, and transport, and a vast military-industrial complex of state-owned arms factories (Armscor, Atlas Aircraft Corporation, Atlantis Diesel Engines) and including sites for nuclear, chemical, and biological weapons development. Public investment then stood at around 10% of GDP.

Mining, despite its decline as a component of GDP, still remains central to the present economy. What Fine and Rustomjee (1996) termed the 'minerals-energy complex' extends across manufacturing and services, and while gold production has fallen dramatically to the present level of 225 tons, platinum, coal, and iron have grown in importance, so that minerals are still the major component of exports.

†http://www.compcom.co.za/about-us/

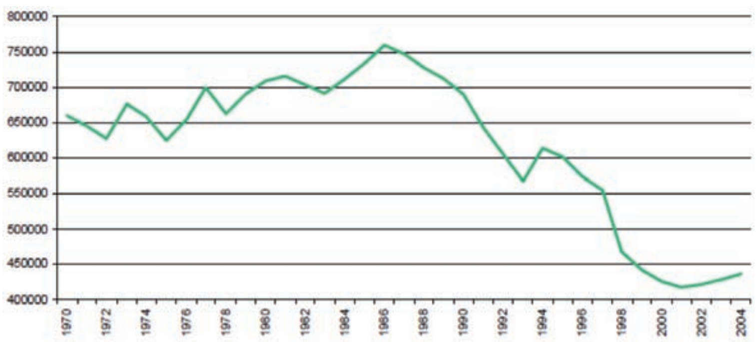

Figure 1—Employment in mining, 1970 – 2004 (Edwards and Alves, 2005)

Freedom Charter, lean state, and the New Growth Path

Inevitably, the dominance of mining and agriculture with their harsh labour practices made these activities central elements of the 1955 Freedom Charter adopted at the so-called Congress of the People. Clauses 4 and 5 of the Charter respectively declared‡:

§4: The People Shall Share in the Country's Wealth!

(a) The national wealth of our country, the heritage of South Africans, shall be restored to the people;

(b) The mineral wealth beneath the soil, the Banks and monopoly industry shall be transferred to the ownership of the people as a whole;

(c) All other industry and trade shall be controlled to assist the wellbeing of the people;

(d) All people shall have equal rights to trade where they choose, to manufacture and to enter all trades, crafts and professions.

§5: The Land Shall be Shared Among Those Who Work It!

(e) Restrictions of land ownership on a racial basis shall be ended, and all the land re-divided amongst those who work it to banish famine and land hunger;

(f) The state shall help the peasants with implements, seed, tractors and dams to save the soil and assist the tillers;

(g) Freedom of movement shall be guaranteed to all who work on the land;

(h) All shall have the right to occupy land wherever they choose;

(i) People shall not be robbed of their cattle, and forced labour and farm prisons shall be abolished.

The Freedom Charter was a reaction against injustice and dystopia, a statement of utopia combining a heady mix of liberalism and socialism, and must be interpreted in the context of its time, and its authorship. It was a protest against the arbitrary injustices that supported white hegemony. The inputs to the Charter came from all walks of life – theologians, teachers, ex-combatants of the 2nd World War, lawyers, avowed communists, liberals, nationalists, and tribal chiefs, although the acknowledged writer was Rusty Bernstein. This was not a Freedom Charter of a bourgeoisie trying to overthrow a ruling monarchy. It was the expression of a non-racial assembly seeking to put an end to the white National Assembly.

Taking points §4(a) and the first part of (b) first, these goals have since been achieved through the Minerals and Petroleum Resources and Development Act of 2002, which has nationalized what lies below the ground, onshore and offshore, transferring these assets to state ownership. This interpretation is acknowledged in the 8 January 2012 speech of ANC President Zuma marking the centenary of the founding of the South African Native National Congress. The land issue remains unresolved, and among other matters limits on foreign ownership of land are under discussion.

‡Numbering not in original

Controls on industry as mooted in 4(c) are not being considered, save for the operations of the Competition Commission, and the avowed intent expressed in the New Growth Path (EDD, 2010) to use competition law to level the playing field on which capital and labour juggle for primacy.

While 4(d) has been achieved, skill and educational inequalities, and inequities in social and financial capital restrict participation and promote political and economic exclusion. Racial clauses no longer apply to 5(e), but the hidden complexity of the clause has yet to be fully exposed to public debate. Would ‘re-division’ imply an end to common ownership of tribal lands? Would unelected traditional leadership accept such intrusion onto their domain with its inevitable curtailment of their power?

Paragraph 5(f) is essentially about agricultural extension and support services. It is not under contention, although agricultural extension services for emergent farmers are in disarray. The long-term impact of the 1992 deregulation of agriculture is still being felt and is poorly understood. The freedom of movement envisaged in 5(g) is enshrined in the Bill of Rights, while 5(h) is now subject to the Law of Contract. The excesses of 5(i) are largely things of the past. The property clauses of the Constitution serve to limit the expropriations envisaged in paragraphs 4(b), 4(c), and 5(e).

Reading these clauses today, with a constitutionally enshrined Bill of Rights, one realizes how far South Africa has progressed toward the liberal polity, albeit one that is also nationalist in expression.

What is also evident is that the country continues to display many pre-1994 features, which Acemoglu and Robinson (2012) describe as originating in ‘extractive’ political and economic institutions. By this is meant institutions that favour one group over another; that are excluding; that extract power or wealth in unfair ways. While the political system of the apartheid years has given way to a constitutional democracy, the pressures for redress, coupled with the electoral majority that the ruling party enjoys, combine to create an environment that displays ‘extractive’ elements such as the capture of public assets by the bureaucracy, unchecked corruption, and attempts to limit the independence of the judiciary. The economy remains ‘extractive’ through high barriers to entry perpetuated by lack of financial capital and know-how, as well as through the gatekeeping role of the trades unions. Unsurprisingly, underemployment remains a key constraint on growth, with the proposed youth wage subsidy vehemently opposed by the Confederation of South African Trades Unions (COSATU).

Another aspect of the emerging liberal economic polity was the 1979 decision to privatize Sasol. A year later, South African Railways and Harbours was corporatized into SA Transport Services as a precursor to privatization, becoming state-owned Transnet in 1990. Eskom was also corporatized, with ISCOR privatized in 1989. Despite the then on-going negotiations with the now legal mass democratic movement, the National Party government proceeded with its liberalizing agenda so that the 1992 Kassier Committee of Inquiry deregulated agriculture and unbundled the marketing boards. State arms factory Armscor was largely absorbed into Denel (Pty) Ltd, founded in the same year. The lean state had arrived.

In a way, today's ANC government resembles that of the 1924 Pact Government, since the ANC shares power with labour through the proxy of COSATU and the South African Communist Party. COSATU affiliates have control of a number of ministries, including Economic Development (with the Competition Commission and Public Investment Corporation), Labour, Education, and Health; the SACP controls Trade and Industry, Agriculture, Higher Education and Training, and very critically, the National Treasury. This represents a continuation of broad-spectrum politics, though fault lines are in evidence: a 'deep state' based on ANC exiles leads the Presidency, Defence, Safety and Security, Intelligence, International Relations, Home Affairs, and Treasury, while 'labour' has sway across the delivery departments mentioned above.

The ministries responsible for public assets are Transport, Public Enterprises, Minerals, Energy, and Public Works. Allocation of these Ministries seems to have been used to balance interests across members of the ANC 'broad church,' a collectivity today much wider than it was in the 1950s before it was proscribed. The ANC now includes the rump of the United Democratic Front as well as former Tri-Cameral Parliament and Bantustan senior officials and political leaders.

Even so, the National Treasury stands *sui generis*, working alongside the Reserve Bank to ensure macro-economic stability and financial probity. This appears to be working – note that according to the Global Competitiveness Report 2010-11 South Africa holds 9th position for financial development (WEF, 2010). Yet there are concerns, as in rating agency Moody's 7 November 2011 downgrade of the rand from 'stable' to 'negative.'

Policy intent and reality

The onset of democracy posed a particular problem for the ANC Youth League (ANCYL). Its 1944 origins lay in reaction against perceived conservatism of the ANC leadership and the influence of communists in the ANC. The leadership of the early ANCYL was highly educated – lawyers and teachers – and they set about dragging the ANC into physical contest with the proto-apartheid state. That anti-communism, a fierce Africanism, and a propensity for violence remain characteristics of today's ANCYL, though the calibre of its leadership and their discourse pale in comparison with that of their forebears. In addition, the ANCYL, unlike its antecedents, enjoys the support of political benefactors who are using it as a proxy agent for their own ends. The role of the ANCYL as a nursery for future leadership has continued, with former ANCYL presidents now serving as the ministers of Public Enterprises, and Sports and Recreation.

Using the precepts of the Freedom Charter as its spearhead, the ANCYL has sought to position itself as the voice of the poor and marginalized. This space has opened up, since ANC membership has increasingly shifted toward that constituency. It must be noted however that there are other shifts in the ethnic composition of ANC membership, with KwaZulu-Natal members now making up a quarter of its total membership. These dimensions make for difficulty precisely to characterize today's ANCYL, let alone the ANC. The tensions within the ANC are a matter of public record and pivot on a contest for political control of the state cash cow.

The ANCYL (2010, p. 2) in its position paper has declared:

'*NATIONALISATION OF MINES means the democratic government's ownership and control of Mining activities, including exploration, extraction, production, processing, trading and beneficiation of Mineral Resources in South Africa. Minerals Resources refer to all the more than 50 non-renewable precious, industrial and chemical stones extracted from Mines in South Africa. This includes but not limited to Gold, Platinum Group Metals, Chrome, Coal, Manganese, Diamond, Copper, Metals, Aluminium, etc.*'

This is a very broad conception of what is to be nationalized, extending as it does along the minerals value chain, even including commodities such as aluminium, which is processed locally, but whose raw material is not mined here.

The document then goes on to explain that 'having nationalised key parts of the economy does not automatically mean that indeed the entire wealth is in the hands of the people and that the people will benefit from such wealth' (*idem*, p. 2). In other words, nationalization is not synonymous with socialism. This is followed with a nod toward the role of the trades unions through the declared intent that the ANC should '(democratise) the commanding heights of the economy, to ensure they are not just only legally owned by the state, but thoroughly democratised and controlled by the people – their workplaces, their management, and decision-making process. The role of the revolutionary trade union movement and progressive professionals is critical in this regard' (*idem*, p. 2). Clause 8 of the position paper argues for seizure of the state-owned enterprises, while clause 9 seeks to place a limit on exports and a return to the autarchy of the sanctions years.

The subsequent clauses are simplistic, showing a lack of appreciation of basic economics, especially pricing. The document oscillates between being pro- and anti-capital as it struggles to identify who its intended audience might be. The ANCYL, like the ANC, tries to be all things to all people. These limitations aside, the document has had its intended effect. The country has been forced to take note of nationalization as a possible means to address poverty. Other damage has also been done: the Moody's downgrade is exactly the signal that investors are taking note of the ANCYL as a disruptive force.

In parallel with the rise to prominence of the ANCYL is another tendency, represented in the New Growth Path (NGP) of the Economic Development Department (EDD, 2010). That document, the product of a new department headed by a former trade unionist, presages a developmental state that will offer a worker's utopia, where 'decent' work will prevail, all inefficiencies will be resolved by the control of executive wages, and anti-competitive behaviours will be no more.

Primarily, the NGP seeks to improve performance in terms of labour absorption as well as the composition and rate of growth' (EDD, 2010, p. 1). The main indicators for the attainment of these objectives will be evidenced in "jobs, growth, equity and environmental outcomes" (*idem*, p. 6). Its goal is to 're-industrialize' the economy with an eye on the markets of China, Brazil, and India.

The internal logic of the NGP is problematic in that it places knowledge and innovation in the far future, while these require the longest period to grow, and thus require immediate action. Moreover it displays conceptual difficulties in its identification of 'core strengths' - capital equipment for construction and mining, 'heavy' chemicals, pharmaceuticals, software, green technology, and biotechnology. The innovation system displays some competence in the first two of these, but neither is likely to be a major source of new jobs. In pharmaceuticals we are an imitator. Strengths in green technology and biotechnology are yet to emerge. That is why knowledge and innovation are so important, and so urgent.

Mining is singled out in the NGP with a call to (accelerate) exploitation of mineral reserves by ensuring an effective review of the minerals rights regime, lowering the cost of critical inputs including logistics and skills in order to stimulate private investment in the mining sector, and setting up a state-owned mining company that would co-exist with a strong private mining sector and that promotes beneficiation, as well as greater utilisation of the mineral resource base of the country for developmental purposes, including potentially through a sovereign wealth fund' (EDD, 2010, p. 12).

One is perplexed by the NGP reference to 'capital equipment for construction and mining.' It is true that local industry is able to build mining infrastructure, but that is quite different to producing capital equipment as in heavy-duty machinery. There is skill in ore handling and separation, and in both cases some patenting strengths. Beyond this, however, the country cannot be classified as a significant producer of machinery. Hausmann and Klinger (2006) have identified machinery and equipment as a potential growth area, but this is different to having core strength.

There is strength in chemicals (Sasol, Omnia, Foskor, AECI etc.), and in high-volume manufacture of generic drugs and other pharmaceutical products, but not in drug discovery. If US patent awards are taken as an indicator of drug discovery capacity, then South Africa is way down the world, ranking at position 34, below Cuba.

Regarding software, Softline is the only local producer of office software. There is, however, considerable strength in software engineering (Old Mutual, Datatec, Didata, retailers and financial services), an activity that is not recognized as patentable and which is now belatedly eligible for the R&D tax incentive. Companies (reverse) engineer the systems that they require. These comments do not of course ignore niche software development, the two best-known examples being Thawte and Mxit. The 'please call me' innovation of MTN is another example of local software development. 'Please call me' turned out to be a highly successful way of expanding network use.

In green technology and biotechnology we are currently minor players. Eskom has entered green energy very late in the day, and is more than likely to follow the 'buy' rather than 'build' route. The present level of investment in technology development in these fields is orders of magnitude below what would be needed to achieve breakthroughs and start entirely new industries.

The New Growth Path will fail because, like the Industrial Policy Implementation Plan, the competing interests that drive economic policy act to limit focus. IPAP seeks to address the entire economy with eighty or more different interventions. Worse still, where it does try to focus it does so from a flawed starting point. By targeting everything one is likely to impact on nothing.

Fundamentally, NGP sees established business as the problem. Negative actions on the part of labour and the state are ignored, assuming that they are even acknowledged let alone understood. According to Mazruder and Van Seventer (2002), the real cost of unskilled labour rose 250% between 1970 and 1999, that of skilled labour by 110%, and highly skilled labour by 90%. When one factors in the Adcorp finding that public sector wages now outstrip the private sector by 50%, one can but agree that South Africa is more like the EU than East Asia in that the surplus 'favours wage growth for those in employment rather than the expansion of employment' (Mazruder and Van Seventer, 2002, p. 6). NGP is silent on this key indicator.

The second factor that is swept under the carpet is the set of unintended consequences of deregulation for agricultural employment, and the raft of post-1994 legislation, including the Extension of Security to Tenants Act, and the Basic Conditions of Employment Act both of which accelerated job shedding and added to rural-urban migration. Unfortunately the post-apartheid state has seen certain negative behaviours persist and others emerge as the 'law of unintended consequences' in policy has played out. The implementation of the Bill of Rights unwittingly encouraged movement of the poor from dysfunctional subsistence on the periphery to seek better living conditions in the centre.

The third is the consequence of accession to the World Trade Organization and the adoption of import parity pricing as the means to set input prices. This means that any domestic comparative advantage was wiped out. And the Eskom 'perfect storm' has now removed low-cost electricity as a comparative advantage. That perfect storm was a consequence of a range of actions that, together with inadequate planning, ill-advised policy choices, and neglect of infrastructure, led to the brown-outs, blackouts, and quintupling of prices.

The fourth is the fact that parastatals continue to exploit their monopoly position to squeeze producers and consumers in order to generate profits for the state. It is meaningless for the New Growth Path, and the National Development Plan 2030 (NPC, 2012) to identify broadband as a growth area while Telkom, in league with the Communications Workers Union and new oligarchs, maintains its stranglehold on pricing. As to technology policy, the New Growth Path largely ducks this issue, being content to repeat the targets of the Department of Science and Technology Ten Year Innovation Plan, and to offer a vague statement of the need for 'adaptation and diffusion of technologies while maintaining our technological edge' (EDD, 2010, p. 23). Exactly what that technological edge may be is not revealed.

In essence it does not recognize that capital, labour, state, and civil society must function synergistically if we are to raise our game as an economic power. Its underlying stance is best captured in the empty dichotomy: 'the challenge for the developmental state is to minimize costs for business except as required to support transformation toward a more equitable, decent work generating and green economy' (EDD, 2010, p. 28).

The 'blame business stance' is captured in the statement that 'Too many business leaders have missed opportunities offered by the profound changes since 1994 or failed to collaborate adequately with other stakeholders. For its part, when business leadership has taken the initiative, government has not always responded adequately' (*idem*, p. 29). It may well be that the frustration generated by the inability of the four partners to agree has created the space for political grandstanding. The adoption of the National Planning Commission 'National Development Plan 2030' is an attempt to bring rationality to bear upon the stark choices we face as a young democracy. The Plan calls for the building of what it terms a 'capable state' (NPC, 2012, p. 59) a phrase redolent of Raul Prebisch's idea of the 'intelligent regime' (Dosman, 2008, p. 181) whose technocrats would ensure that judicious state intervention did not stifle private initiative.

The nationalization debate

Nationalization is an old device: since the industrial revolution of the late 18th century states have taken on the role of constructing and operating infrastructure that in private hands would have constituted a natural monopoly. This has been especially true outside Great Britain, the very country where the industrial revolution erupted. Britain was the only country with private railways. The states of France, Prussia, Austria, and Russia all took the state-owned option for development of transport networks and utilities.

After the 2nd World War Europe saw numerous national industries emerge, including mines, electricity, steel, gas, oil, transport, and telecommunications. The extent of national ownership varied considerably, being highest in France. The Thatcher revolution of the 1970s resulted in the sell-off of much of the 'commanding heights of the economies' with the then exception of a new resource – North Sea gas.

The way that new resources are handled should be of central importance regarding the objects for nationalization.

Newly independent African states experimented with state ownership of plantations and mines, as in Ghana, Zambia, and Tanzania. Political instability, the stresses of Cold War clientism and proxy wars, lack of skills, and steadily falling commodity prices saw these experiments come to naught. The Acemoglu and Robinson thesis is that those nations failed, and that 'nations fail today because their extractive economic institutions do not create the incentives needed for people to save, invest and innovate' (Acemoglu and Robinson, 2012, p. 372). Consumption and disinvestment, and resistance to innovation are symptoms of this.

This brings one to the unusual case of Botswana that features prominently in Acemoglu and Robinson (2012).

Botswana gained independence in 1966; at which point its main sources of revenue were SA Customs Union receipts and the export of chilled and canned beef. Early gold mining at Francistown had been long abandoned and there was one operating copper-nickel mine at Selibe-Phikwe. Crucially, one of the first acts of the new parliament was to declare that mineral rights would henceforth be vested in the state, not the tribe. In 1967 the Orapa diamond mine, in the Makgadikgadi Depression, began production, with the state holding a 15% stake in De Beers Botswana (Pty) Ltd. Orapa was the second largest diamond field in the world, being dispersed over many kilometres, but produced stones of moderate quality. De Beers constructed the mine and associated town and infrastructure.

Then came the discovery of the Jwaneng diamondiferous kimberlitic pipe, which changed everything. That mine, commissioned in 1977 was, and is, the richest in world history. Ahead of its development, the Botswana government, being aware of the richness of the kimberlitic pipe, renegotiated its share in Debswana, raising its stake to 50%. Annual Debswana production now stands at some 23 million carats; this exceeds the volume of diamonds extracted from the Kimberley Mine over its entire life.

The Republic of Botswana, through what is arguably a public-private partnership, gains a 50% share of Debswana profits and dividends, company tax, royalties, and payroll taxes, and is thus the main beneficiary of the diamond wealth. The country has developed toward middle-income status and is trying to diversify its economy away from dependence on diamonds. Thus far it has been able to pressurize De Beers into shifting all of its sorting operations from London to Gaborone, as well as setting up a diamond research laboratory.

Orapa and Jwaneng (not to mention Letlhakane and other newly exploited diamond pipes) represent the diamonds that Rhodes did not find. His British South Africa Police force arrested many Batswana for possession of uncut diamonds, yet refused to believe that these stones were the 'pick-ups' that they in fact were. The Botswana polity is inclusive, and in principle so are its economic institutions.

In the case of North Sea gas, the United Kingdom issued exploration licences to many companies including state-owned BP. A new resource was exploited by an existing state-owned entity. This involved no arguments about nationalization. The state benefited through tax revenues and the development that oil brought to the otherwise neglected Scottish ports of Aberdeen and Inverness. The Norwegian state was also active in developing its North Sea gas resource and has retained state participation in the oil industry, holding a 48.3% in diversified chemicals and energy group Norsk Hydro, as well as controlling state-owned Statoil. The tax and royalty stream flowing from this bonanza has taken Norway to the top rank of wealth as measured by GDP per capita.

Another example is Brazil's Petrobras with its 1953 roots in the closing days of Getulio Vargas' term of office as (a finally) democratically elected president. Over 1930-1945 Vargas had led an authoritarian and corporatist government that ruled with a mix of nationalism, industrialization, welfarism, anti-communism, and populism. Petrobras was founded under the slogan 'it is our oil.' These nationalist sentiments persist into the present democratic era. Petrobras is now the fourth largest company in the world by market capitalization. The Federal Government holds 54%, while the state development bank Banco Nacional de Desenvolvimento Economico e Social (BNDES) and sovereign wealth fund Fundo Soberano each hold 5%. The development and exploitation of the new offshore Tupi Field, which lies up to 7 km below sea level, entails a technological challenge of scale beyond the 1969 moon shot. Indeed, Brazil's development path is now strongly linked to the success of the Tupi venture, with government having declared ambitious local content goals for oil and gas extraction infrastructure.

This is another model of state ownership of a new resource. Brazil provides a range of examples of the privatization of state assets, as in the sale of its telecoms utilities and most notably that of iron miner Vale.

The last example is that of Malaysia's Petronas, which was created in 1974 as the owner of the country's petroleum resources. Petronas emerged after the 1970 declaration of Malaysia's *Bumiputera* ('sons of the soil') affirmative action policy. *Bumiputera* was a consequence of the ethnic conflict of the late 1960s. Petronas is wholly state-owned and is active nationally and internationally in 35 countries.

These few examples point to the many ways that states have sought to deal with the bonanza that conversion of a non-resource into a resource offers. Clearly, where that resource was not previously exploited and lies on state land, or in areas where the state holds monopoly rights, the issue of asset ownership does not arise. Such could be the case for South Africa's mineral assets within its ocean exclusion zone, as well as the development of inland shale-bed gases. Reversing private ownership will be messy, divisive, and costly as the recent cases of nationalizations in Bolivia, Venezuela, and Argentina illustrate. Nationalization has many consequences: it impacts on capital markets and investor confidence, and may even benefit the owners of depleted assets. The ANCYL is among those that recognize this in noting that nationalization should not be used to rescue failing entrepreneurs.

Conclusion: developing the mining sector

Collaboration among mining engineers played a central role in the development of gold mining on the Witwatersrand. This is best illustrated in the replacement of the mercury process for gold separation with the cyanide process, which entailed adaptation of the MacArthur-Forrest process and the dissemination of this knowledge through the young professional societies – the Chemical, Metallurgical and Mining Society of South Africa, the Association of Mine Managers, and the South African Institute of Engineers (Pogue, 2006). Research work of their members coupled with the South African School of Mines, which moved from Kimberley to Johannesburg in 1904, laid the basis for what is now the University of the Witwatersrand, and the associated Mineral Technology Laboratory, today's Mintek. Elsewhere are the laboratories of CSIR Centre for Mining Innovation and the Council for Geoscience, the latter originating as the Department of Geological Surveys.

The most obvious public support for mining has been in the provision of infrastructure, most notably the institutions of what we termed the 'apartheid developmental state.' The role of the state will continue to entail infrastructure provision, scientific and technical services (Geosciences), and contract research (CSIR, Mintek) in cooperation with private sector research partners such as Anglo Research, Anglo Platinum, and the Aurum Research Institute. However it appears that the state role will be much more diverse, with the belated acceptance that the state cannot be the sole player in energy and transport, hence the opening of a space for independent power producers whose surplus may be sold into the national grid, as well as future privately-owned rail networks.

By its own admission, the state lacks the technocratic skills to develop new interventions solely based on in-house expertise, which means that wholly private or public-private developments will be catered for, development state-speak notwithstanding. Kahn (2012) has argued that the targets that the New Growth Path sets for 2018 are unattainable as the present skills resource base is too small. A target of spending 2% of GDP on R&D within 6 years, to be at the same level as Australia is now, would require a feat equivalent to what Korea achieved in the early 1980s. Korea could do so because of its already high quality education system. Our country has refused to make that key investment in people over two generations. The fact is that no major commodity-exporting country spends 2% of GDP on R&D.

Furthermore, in seeking to become more investor-friendly the state has limited freedom of action: expropriation, even were this to become constitutionally sanctioned, will impact negatively on the value of publicly-traded shares of mining companies with adverse effects on their net asset value, and negative spillovers onto the value of linked funds, especially pensions. All will be losers through wholesale nationalization.

Instead a graduated approach might be warranted, in which the right to exploit virgin assets involves state participation. A tantalizing prospect would be to create ISCOR2, which would become a source for iron and steel at prices below those ruling on the London Metal Exchange. State ownership is not an either-or decision. The state has a role to play in development: the issue is how so to do without destroying the golden goose or scaring off new investors.

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