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Africa's Economic Transformation and Global Value Chains: An Analysis of the Platinum Value Chain in South Africa

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Abstract

This article is concerned with the transformation of the African continent beyond the supply of raw materials towards the expansion of productive capabilities in ways that meet the needs of the African people. The article assesses the platinum value chain in South Africa to examine how the sector has impacted on economic transformation in the country. The analysis shows that South Africa is the biggest supplier of platinum globally but continues to miss economic opportunities presented by its platinum endowment. This is due to very weak forward or upstream linkages between the platinum sector and the related manufacturing sectors. Additionally, even though the platinum sector captures a notable share of both production and employment in the mining industry, when it comes to wealth redistribution, gender and race relations, the sector is lagging. Arguably, a country's mineral resources ought to bring about economic transformation required to meet the needs of its people, by leveraging sector specific legislations. This requires deliberate determination to ensure that such a form of resource mobilisation transitions into economic self-sufficiency for the African continent, by also leveraging regional value chains and the African Continental Free Trade Agreement (AfCFTA).

Résumé

Cet article traite de la transformation du continent africain, au-delà de l'approvisionnement en matières premières, vers l'expansion des capacités de production de manière à répondre aux besoins des populations africaines. Le document évalue la chaîne de valeur du platine en Afrique du Sud et examine comment le secteur impacte la transformation économique du pays. Cela est dû à de très faibles liens en amont ou en aval entre le secteur du platine et les secteurs manufacturiers connexes. De plus, même si le secteur du platine

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capte une part notable à la fois de la production et de l'emploi dans l'industrie minière, en ce qui concerne la redistribution de la richesse, le genre et les relations raciales, il est à la traîne. On peut soutenir que les ressources minérales d'un pays, tirant parti de législations sectorielles spécifiques, devraient entraîner la transformation économique nécessaire pour répondre aux besoins de sa population. Cela exige une détermination délibérée de garantir qu'une telle forme de mobilisation se transforme en autosuffisance économique pour le continent africain en tirant également parti des chaînes de valeur régionales et de l'Accord de libre-échange continental africain (ZLECAf).

Introduction

Throughout human history, Africa has made significant contribution to the advancement of the global economy. In pre-colonial times this contribution ranged from the trade of natural resources through to the exchange of knowledge production. It was during the period of colonisation that Africa was subjugated to serve as a provider of raw materials to European imperialists who partitioned the continent for their interests following the Berlin Conference in 1884. During the period of colonisation and expansion of finance capital, the emphasis was to place Africa at the lower means of production. At best, Africa has since largely remained at the bottom of global production.

In recent years, there has been growing interest to transform the continent beyond the supply of raw materials towards the expansion of productive capabilities in ways that meet the needs of the African people. One of the ways to understand Africa's level of application of its existing productive capabilities and the factors that shape the advancement of these capabilities is to examine global value chains (GVCs). A value chain describes the full range of activities that are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use (Kaplinsky and Morris 2002:4). The concept of a global value chain means that the production of goods and services has become globalised such that, for example, 'a shirt may be designed in New York, cut in India, assembled in Kenya, and sold to a consumer in Los Angeles' (McCormick and Schmitz 2001:17). Given the intensification of GVCs where the production of products is geographically fragmented such that value is added in multiple countries before products make their way to consumers, it is important to examine the implications of GVCs for Africa's economic transformation.

Theoretical Framework

This article is premised on the recognition that housing, healthcare, better working conditions, food, a clean environment and democratic social relations are fundamental needs for productive socio-economic development. It is therefore necessary for any transformation on the African continent to address these needs in order to uphold the dignity of the African people. Centring and preserving their humanity is integral to the emancipatory framework, which places emphasis on the democratic rights of peoples to undertake autonomous transformational actions to address their needs. It is anchored on ideas regarding the fundamental freedoms of humanity and thus questions diverse forms of oppression in society that have been characteristic of capitalist modes of accumulation across the world, and in Africa specifically. The emancipatory framework draws its foundations from philosophical theorists such as Kwame Nkrumah (1961), Walter Rodney (1973) and Bob Marley (1980).

At this point, it is important to distinguish economic transformation from economic development. According to Gumede (2015:33), economic transformation refers to processes aimed at changing economic relations for the better so as to benefit more people. Economic development, however, is understood as economic growth and benefits associated with social development, which is in turn concerned with improvements in the well-being of people.

Problem Statement and Objectives of the Study

African economies are endowed with rich natural resources, both in agriculture and mining clusters. Arguably, if these resources were optimally mobilised, through democratic productive means, this would bring about the economic transformation required to meet the needs of the African people. Such a form of resource mobilisation is also critical for transitioning the African continent into economic self-sufficiency. Walter Rodney (1973) articulates how Europe underdeveloped Africa and it is important to recognise the impact left on Africa by colonial imperialists and the ways in which it has greatly hindered the realisation of economic self-reliance across the continent. Furthermore, the nature of finance capital accumulation throughout colonial and pre-colonial times has meant that the global economy is not structured in ways that promote the involvement of Africa in more beneficial aspects. In the context of GVCs this has meant that Africa remains at the bottom of value chains as a supplier of raw materials and a consumer of imported finished products.

South Africa can be viewed as one of the glaring examples of how African countries have been positioned in the global mining economy and the resultant impacts on economic transformation. The most obvious have

been de-industrialisation in favour of financialisation[1] and exurbanite illegal capital flight (see, for instance, Fotoyi 2016). This is why, in its 2017 Economic Transformation Discussion Document, South Africa's governing party, the African National Congress (ANC), declared as part of its economic transformation agenda for the country that there is a need to 'transform the mining sector with the aim of widening the benefits of South Africa's abundance of minerals, including the creation of safe and decent work on the mines as well as benefits for near-mine local communities, as well as give particular focus to mineral beneficiation' (ANC 2017).

Therefore, this article examines the impact of mining GVCs on Africa's economic transformation by looking at the platinum value chain in South Africa. The article focuses on how the platinum mineral GVC impacts on various aspects of South African society that are crucial to economic transformation, in particular wealth redistribution and racial and gender relations.

Methodology

The article primarily relies on available data on platinum GVCs and, in particular, those that focus on the platinum mineral sector in South Africa. The information obtained is subject to value chain analysis.

The article is cognizant of the fact that some of the key analytical constructs that inform value chain analyses focus on the manner and trajectory in which producers enter and then participate in wider markets (Kaplinsky and Morris 2002:24). Accordingly, mainstream value chain analyses focus on questions about governance, barriers to entry and challenges for catch-up on the GVC, i.e. innovation and upgrading. This contemporary approach to GVCs analysis is arguably neoliberal, primarily because the mainstream approach views value chains from the perspective of markets and not the needs of people. It therefore has limitations in answering the question of how the platinum mineral GVC impacts on various sections of South African society, crucial to economic transformation, particularly with regards to wealth redistribution, race and gender relations. Therefore, an emancipatory-centred approach to value chain analysis is adopted in this article, and the analysis framework guided by questions that examine wealth redistribution and racial and gender gaps.

Platinum Value Chain

Platinum is part of the Platinum Group Metals (PGMs), which also include palladium, rhodium, iridium, osmium and ruthenium. PGMs are known for their purity, high melting points and unique catalytic properties. In addition to their oxidation and reduction properties, they are also extremely resistant to

corrosion. PGMs are consequently utilised in a number of industrial processes, technologies and commercial applications. Their unique chemical and physical properties make PGMs an excellent raw material, catalyst and ingredient for manufacturing processes.[2]

Figure 1 shows the platinum value chain divided into five broad sections: exploration, mining, processing through milling and concentrating, smelting and refining of base metals and precious metals and fabrication.

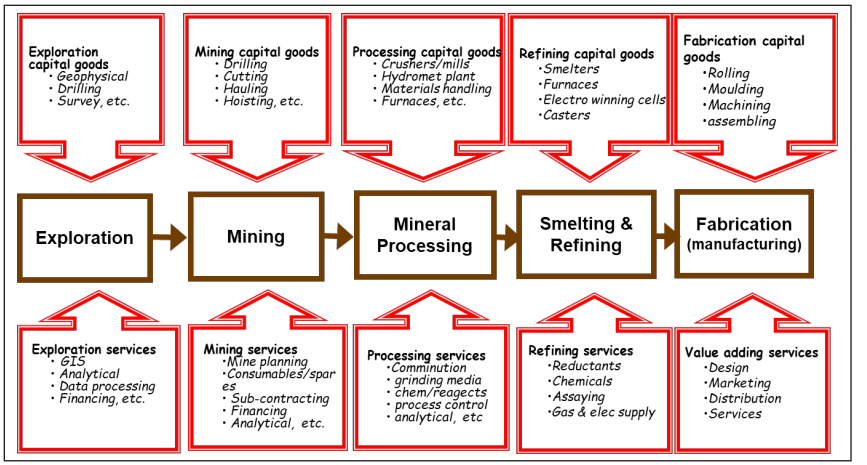

Figure 1: Platinum value chain
Source: Jourdan (2013)

Platinum Global Supply and Demand

This section looks at the global supply and demand for platinum. For a detailed breakdown of the data see Tables 1 and 2 in the Appendices section.

As seen in Figure 2, South Africa produces the largest output of refined platinum in the world. The structure of platinum supply remained fairly unchanged between 2013 and 2018, except for a one per cent decline from Russia in favour of Zimbabwe.

Platinum is applied to a number of consumer and industrial products (see Table 3 in the Appendices for a detailed description of platinum application). Figure 3 shows that in 2018, auto-catalyst, jewellery and chemical application made up over 80 per cent of global platinum demand. Notably, platinum demand for investment declined from 11 per cent in 2013 to 0.2 per cent in 2018.

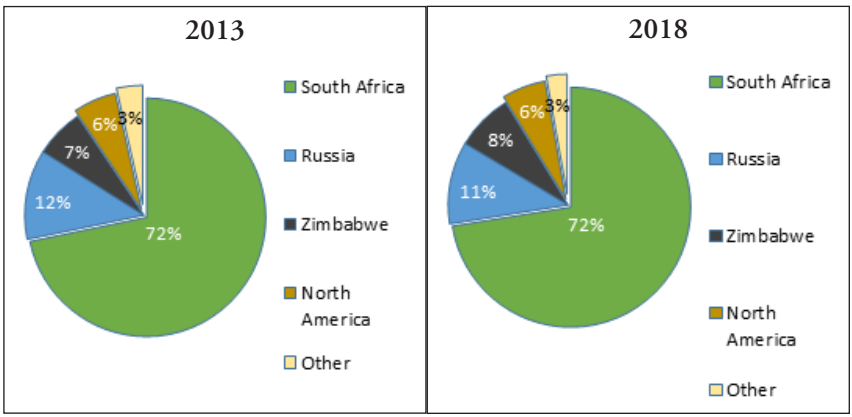

Figure 2: Global platinum supply by country, 2013 and 2018
Source: Data from World Platinum Investment Council (2019)

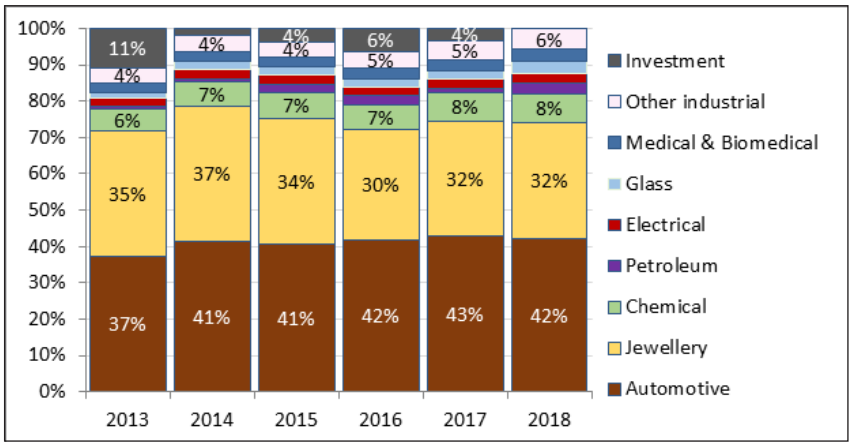

Figure 3: Global platinum demand by application, 2013 to 2018
Source: Data from World Platinum Investment Council (2019)

Figure 4 presents platinum demand by region. In 2018, the biggest automotive demand for platinum came from Western Europe. China demands platinum for jewellery, chemicals, electrical products and glass. Petroleum and medical demand for platinum came from North America.

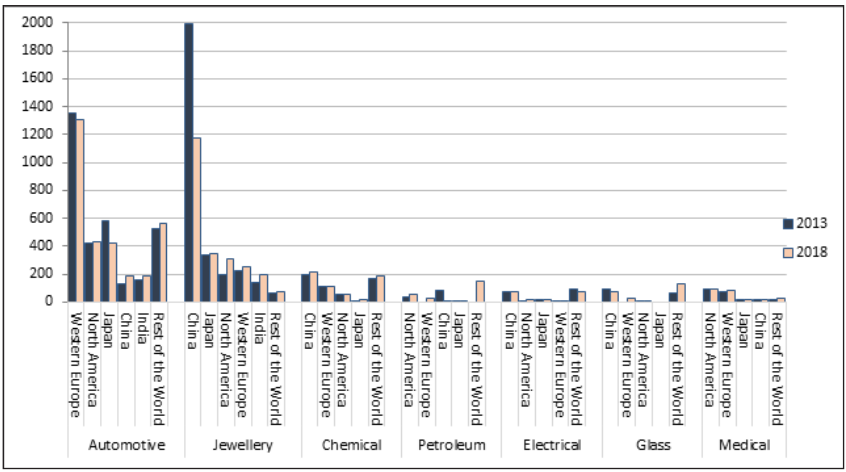

Figure 4: Global platinum demand by region, 2013 and 2018
Source: Data from World Platinum Investment Council (2019)

South African Platinum Sector

South Africa's platinum sector is dominated by the three largest platinum producers in the world – Anglo American Platinum (Amplats), Impala Platinum (Implats), and Lonmin. There are several smaller companies in the sector that focus on exploration and operate joint ventures with the larger companies (Conradie 2016: 1). South Africa's platinum mines are integrated such that exploration, mining of the minerals, processing through milling and concentrating, smelting and refining of base metals and precious metals are undertaken by the mining companies. For some of these companies this process occurs on mining property. The refined platinum is then supplied to customers in the form of sponge, bars or grain (Conradie 2016:1).

This section focuses on the South African platinum sector in order to examine the impact of platinum value chains on South Africa's economic transformation. It is the real economy (which include agricultural, mining, manufacturing and construction industries) that can bring economic transformation to Africa, and not the financial economy that gives rise to financialisation.

As seen in Figure 5, the mining sector is the second biggest contributor to the South African real economy. This signifies the importance of the sector in this economy.

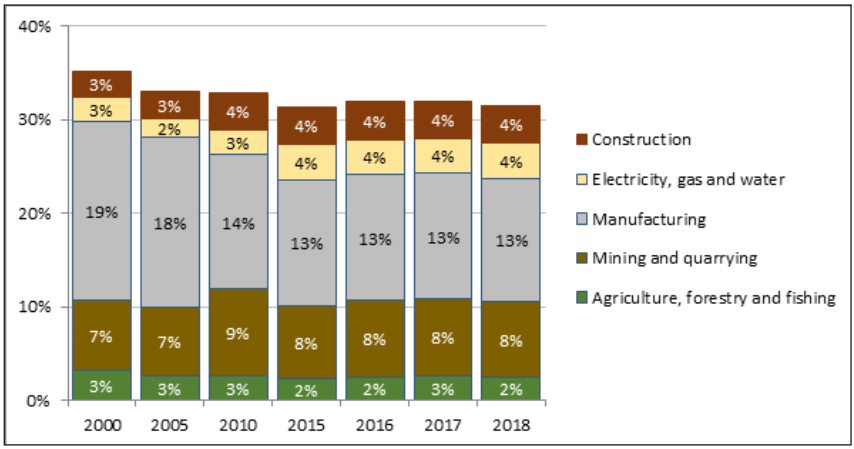

Figure 5: The South African real economy, 2000 to 2018

Source: Data from Statistics South Africa (2019a)

The structure of the South African mining economy has become more diversified over the years. The biggest shifts are shown in Figure 6, where the dominance of gold has declined from 67 per cent in 1980 to 14 per cent in 2018; and PGMs have increased their share from 5 per cent in 1980 to 21 per cent in 2018, and coal from 10 per cent in 1980 to 29 per cent in 2018.

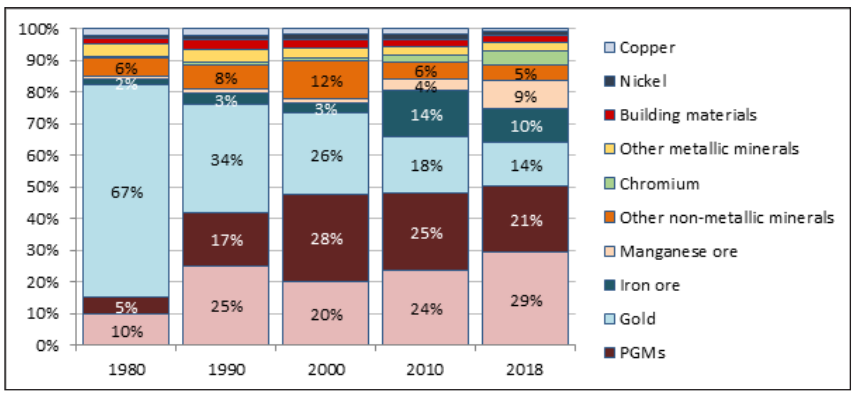

Figure 6: Structure of the mining sector (sales at current prices), 1980 to 2018

Source: Data from Statistics South Africa (2019b)

Figure 7 shows that platinum sales dominate PGMs sales with an average share of 65 per cent. As a percentage of total mining sales, platinum sales have been on a steady decline since 2016.

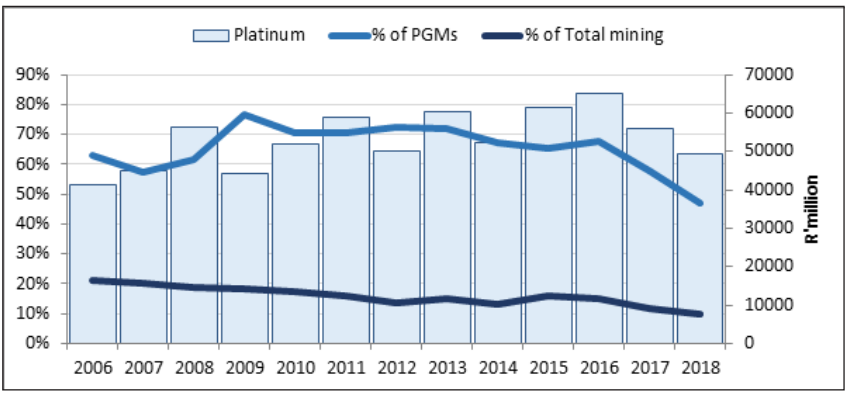

Figure 7: Platinum sales as a percentage of PGMs and total mining sales
Source: Data from the Department of Mineral Resources (n.d.) and Statistics South Africa (2019b)

Even though South Africa is the world's biggest producer of platinum, the country's sales of the mineral are dominated by exports as seen in Figure 8. The share of demand by the local manufacturing sector is very low.

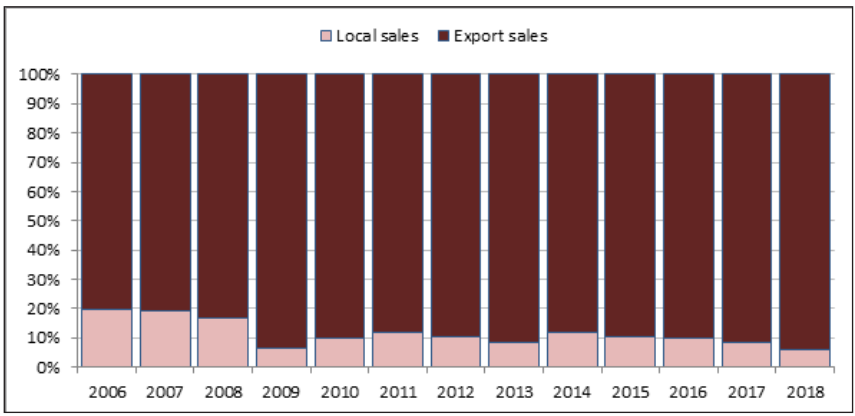

Figure 8: Platinum sales – local vs exports
Source: Data from the Department of Mineral Resources (n.d.)

Platinum co-exists with palladium, rhodium, iridium, osmium, and ruthenium as PGMs. Figure 9 shows that platinum captures a significant share of employment within the mining industry.

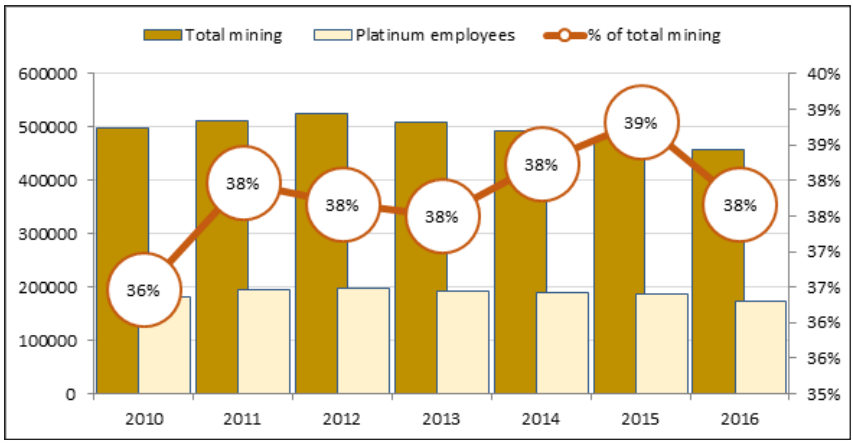

Figure 9: Platinum employment as a percentage of total mining employment
Source: Data from the Department of Mineral Resources (n.d.) and Quantec EasyData (2019)

The platinum industry remains a male-dominated sector, both in permanent and contract employment, as shown in Figure 10. Yet, platinum captures a significant share of female employment within the mining industry, averaging 35 per cent as seen in Figure 11. In terms of earnings from the platinum sector, male employees take the lion's share, as seen in Figure 12.

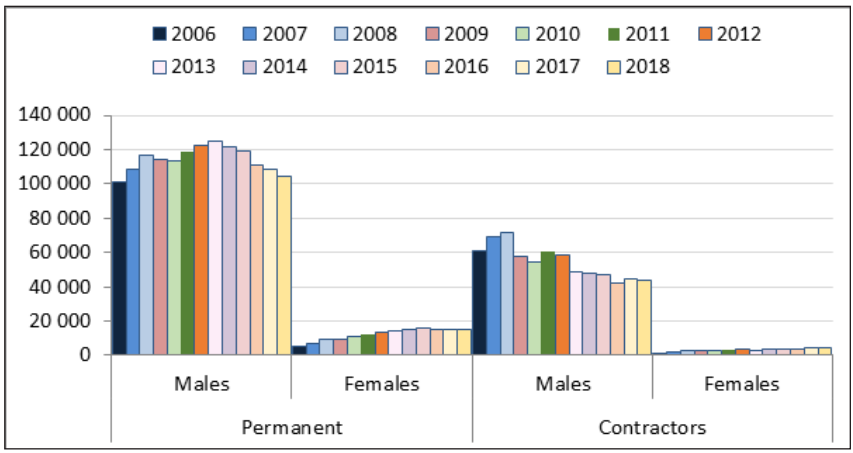

Figure 10: Platinum industry employment by gender
Source: Data from the Department of Mineral Resources (n.d.)

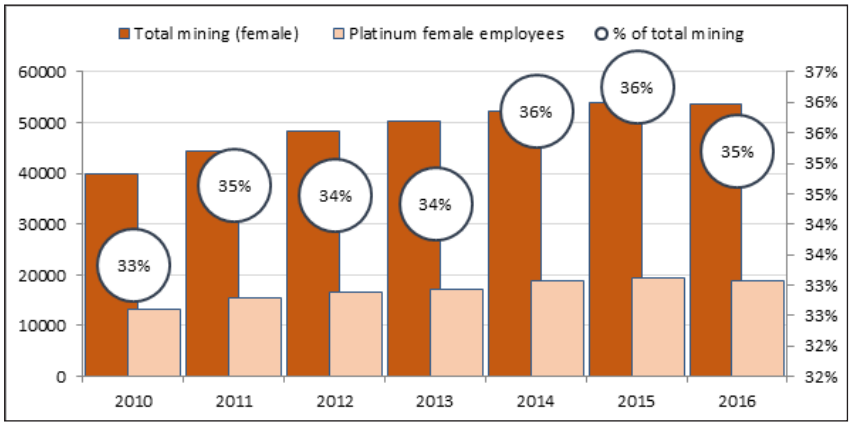

Figure 11: Platinum female employees as a percentage of total female mining employees
Source: Data from the Department of Mineral Resources (n.d.) and Quantec EasyData (2019)

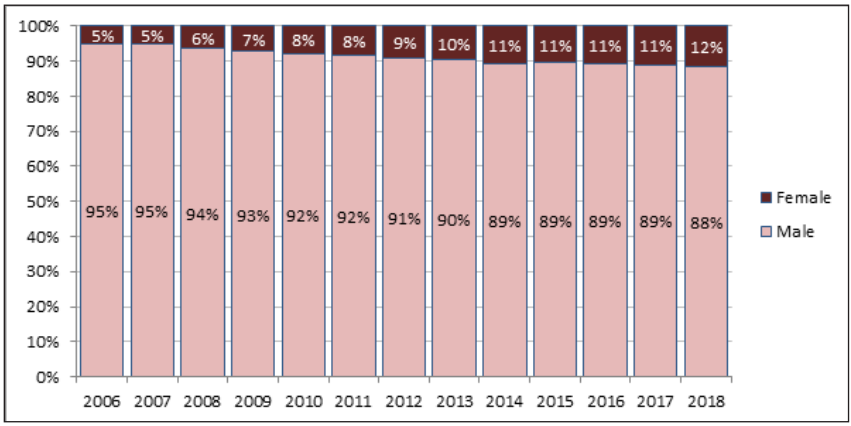

Figure 12: Share of earnings by gender
Source: Data from the Department of Mineral Resources (n.d.)

As part of European colonial rule, South Africa endured a racial and gendered apartheid system that institutionally benefitted the white minority in terms of high-ranking jobs and wealth creation. Since 1994 the first democratically elected ANC-led government has championed affirmative action, under the Employment Equity Act of 1998, to ensure that 'previously disadvantaged' groups have equal opportunities to employment and are equally represented in all job categories and levels within the workplace. As well, the goal is to distribute wealth across as broad a spectrum as possible of 'previously disadvantaged' South Africans through the Broad-Based Black Economic Empowerment Act of 2003.

Figure 13 shows that platinum mines have a Broad-based Black Economic Empowerment (BBBEE) recognition level that is lower than the overall mining industry average. Platinum mining is lagging behind in terms of redistributing equity assets to foster economic inclusion and black participation (ownership), implementing an affirmative action plan (employment equity), funding the up-skilling of black people, and purchasing from BBBEE compliant companies. However, when it comes to identifying black directors and managers and developing small black-owned companies, as well as fostering social investment initiatives, the platinum mines out-perform the overall mining industry average.

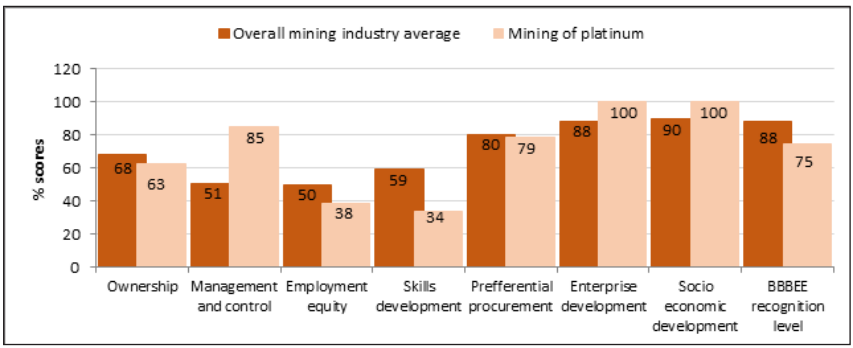

Figure 13: Broad-based Black Economic Empowerment
Source: Conradie (2016)

Conclusion

South Africa is the biggest supplier of platinum globally. Yet, the country's forward or upstream linkages (processing and transforming extractive produce into manufactured products) between the South African platinum sector and the related manufacturing sector are very weak. Arguably, South Africa continues to miss the economic opportunities presented by the country's platinum endowment due to lack of demand across all categories of application. This is unfortunate because South Africa's platinum sector has great potential to foster economic transformation in the country. The sector captures a notable share of both production and employment in the mining industry. Still, in terms of wealth redistribution, gender and race relations, the sector is lagging and can do more to bridge these gaps by leveraging mining industry specific sector regulations such as the:

- Mineral and Petroleum Resources Development Act (MPRDA), No. 28 of 2002;

- Mineral and Petroleum Resources Development Amendment Bill, 2013;
- Broad-based Socio-economic Empowerment Charter for the Mining and Minerals Industry (Mining Charter);
- Mine Health and Safety Act, No. 29 of 1996;
- the Mineral and Petroleum Resources Royalty Act, No. 28 of 2008; and
- Precious Metals Act, No. 37 of 2005.

This requires that the South African government enforces strict compliance and conducts ongoing monitoring and evaluation to ensure the widening of benefits from platinum value chains. Furthermore, there needs to be shared understanding between all stakeholders, through dialogue and advocacy, that the country's mineral resources ought to bring about economic transformation required to meet the needs of the people, and thus where required regulations need to be amended. Finally, there needs to be a deliberate drive to ensure that such a form of resource mobilisation transitions into economic self-sufficiency for the African continent, by also leveraging regional value chains and the African Continental Free Trade Agreement (AfCFTA).

Notes

1. Stockhammer (2010:2) explains that financialisation is the term used to summarise a broad set of changes in the relation between the 'financial' and 'real' sectors which give greater weight than heretofore to financial actors or motives. Stated differently, the undertakings of fictitious capital and operations of the 'shadow economy' cannot address the economic transformation question.
2. See, for example, http://www.platinumgroupmetals.net for the range of processes and projects in which it is used.

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Appendices

Table 1: Platinum refined production

	2013	**2014**	**2015**	**2016**	**2017**	**2018**
South Africa	4355	3115	4480	4255	4380	4410
Russia	740	740	710	715	720	675
Zimbabwe	405	405	405	490	480	470
North America	355	400	385	395	365	360
Other	215	195	180	180	180	170
Total	**6070**	**4855**	**6160**	**6035**	**6125**	**6085**

Source*:* World Platinum Investment Council (2019)

Table 2: Platinum gross demand

Automotive		2013	2014	2015	2016	2017	2018
		3170	3310	3380	3465	3325	3100
	Auto-catalyst	3025	3165	3240	3320	3180	2960
	Non-road	140	150	140	135	140	145
Jewellery		2945	3000	2840	2505	2460	2355
Industrial		1485	1565	1760	1780	1700	1895
	Chemical	535	540	595	560	590	575
	Petroleum	50	65	205	215	100	240
	Electrical	195	205	190	185	195	190
	Glass	145	175	200	205	185	235
	Medical & Biomedical	220	220	225	230	235	240
	Other	340	360	345	385	395	415
Investment		935	150	305	535	275	15
	Change in bars, coins	-5	50	525	460	215	280
	Change in Exchange Traded Funds (ETFs) holdings	905	215	-240	-10	105	-245
	Change in stocks held by exchanges	35	-115	20	85	-45	-20
Total demand		8535	8025	8285	8285	7760	7365

Source: World Platinum Investment Council (2019)

Table 3: Description of platinum demand by application

Demand	Application
Automotive demand comprises auto-catalyst demand and non-road engine catalyst demand.	The auto-catalyst is installed in a vehicle's exhaust line where it converts pollutants from the combustion of fuel into harmless gases. Auto-catalysts used with diesel engines contain higher amounts of platinum than those used with petrol engines.
Jewellery demand	Due to its rarity, purity and natural white colour, and its enduring quality and resistance to tarnishing, platinum is a very popular metal for bridal jewellery in many countries and for fashion jewellery in Asia in particular.
Industrial demand comprises chemical, petroleum, electrical, glass, medical and biomedical, and other applications.	The use of platinum in **chemical applications** includes catalysts used in the manufacture of certain silicones, catalysts used in the synthesis of raw materials for the production of polyethylene terephthalate (PET) for the production of polyester textile and plastic containers, and catalysts for the conversion of ammonia to nitric acid used in fertilisers and explosives. Platinum is used in catalysts for the **refining of petroleum** in a process called catalytic reforming. In the **electrical industry** hard disk drives use platinum-containing disks to store data in personal computers, DVD players and other devices. Platinum is also used to coat some electrodes and multi-layer ceramic capacitors. Platinum is used in the fabrication of vessels that hold, channel and form the high-quality molten **glass** that is used, for example, to produce LCD and plasma screens. Platinum's usages in **medical and biomedical applica-tions** include implants and tools such as aural and retinal implants, pacemakers, defibrillators, catheters and stents, as well as being the active ingredient in chemotherapy drugs and in radioactive implants for radiation therapy. Another application where platinum is used is in fuel cells where it is the catalyst that converts hydrogen and oxygen to heat, water and electricity.
Investment demand includes coins, bars and ETFs.	A number of different retail investment products have been introduced to meet demand for platinum, which can be bought and kept as a repository of value, often for long periods.

Source: Conradie (2016

Table 4: Platinum demand by region

Application	Region	2013	2014	2015	2016	2017	2018
Automotive	Western Europe	1350	1440	1550	1705	1560	1305
	North America	425	465	485	445	415	430
	Japan	580	590	510	455	440	420
	China	130	120	125	165	195	190
	India	160	160	175	165	165	190
	Rest of the World	525	535	535	530	550	565
Jewellery	China	1990	1975	1765	1450	1340	1175
	Japan	335	335	340	335	340	345
	North America	200	230	250	265	280	305
	Western Europe	220	220	235	240	250	255
	India	140	175	180	145	175	200
	Rest of the World	60	65	70	70	75	75
Chemical	China	195	215	255	225	225	215
	Western Europe	110	105	100	110	120	110
	North America	55	55	65	50	55	50
	Japan	10	10	10	15	15	15
	Rest of the World	165	155	165	160	175	185
Petroleum	North America	40	25	-25	90	55	55
	Western Europe	-45	-15	70	10	5	25
	China	80	-5	45	80	45	10
	Japan	10	-35	5	0	-40	5
	Rest of the World	-35	95	110	35	35	145
Electrical	China	75	70	65	75	80	75
	North America	10	15	15	10	15	15
	Japan	15	15	15	15	15	15
	Western Europe	5	10	10	10	10	10
	Rest of the World	90	95	85	75	75	75
Glass	China	90	85	95	100	85	75
	Western Europe	-10	15	10	5	10	30
	North America	5	10	0	20	5	5
	Japan	0	-25	-5	-10	-10	0
	Rest of the World	60	90	100	90	95	125

Medical	North America	90	90	90	90	95	95
	Western Europe	75	75	75	80	80	80
	Japan	20	20	20	20	20	20
	China	15	15	20	20	20	20
	Rest of the World	20	20	20	20	20	25
Other industrial		340	360	345	385	395	415
Investment		935	150	305	535	275	15
Total demand		8535	8025	8285	8285	7760	7365

Source: World Platinum Investment Council (2019)