GOLD STACKERS
AUSTRALIA

China's Imports Shift Platinum Into A Global Deficit, Presenting A Conundrum To The Industry

Research by:
Dr David Davis
PhD. MSc. MBL. CEng. CChem.
FIMMM. FSAIMM. FRIC.

March 2022

In this long-dated review, I focus on how the relationship between platinum imports and exports actually impacts above-ground stocks and the corresponding price.

The industry does not report platinum import and export data either globally or by region. The industry, therefore, relies only on global supply-and-demand forecasts provided mainly by research organisations as well as market fundamentals to support such forecasts. In this regard 'supply is assumed to be equivalent to demand' (including year-on-year changes in NYMEX).

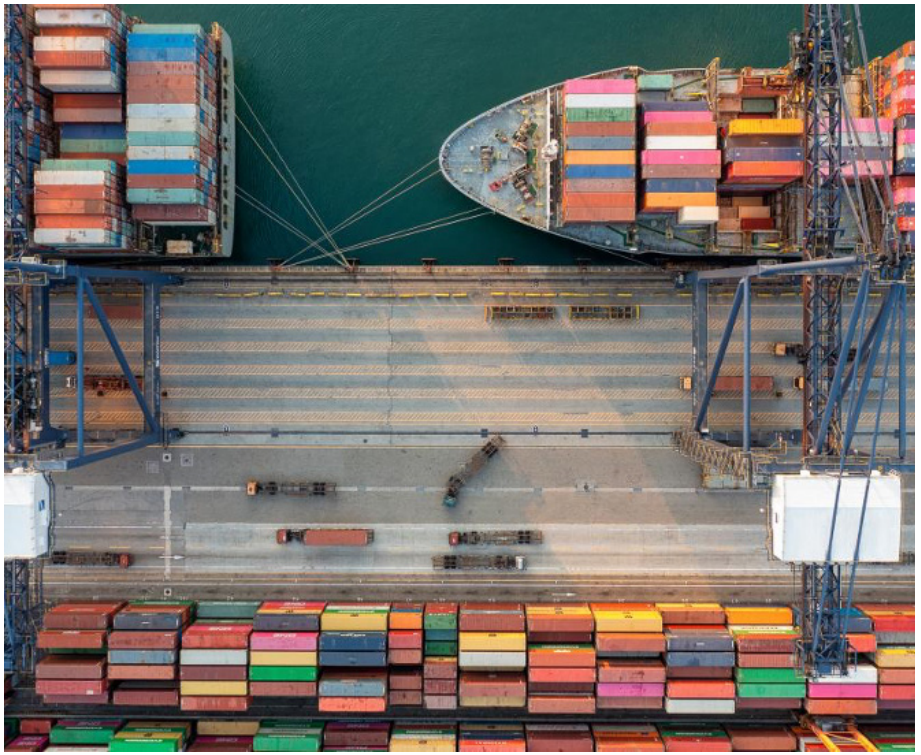
A key question being asked of the platinum producers, the market and investors in the current economic environment is: 'What factors, when combined, are likely to push the platinum market balance into deficit thereby exerting upward pressure on the price?'. Historically, a number of 'events' and market sentiment have had a significant influence on determining the platinum price on a short-term basis. (Excluding the Russian invasion of Ukraine of course).

I argue that supply-and-demand forecasts presented to the market, do not give a complete picture of the platinum industry at present. I contend that my estimates of import and export data together with estimates of above-ground inventory, both globally and by region, provide additional and important information to take into account when forecasting market trends, overall market balance and the residual platinum price.

These assertions were initially reported by me in the summer of 2017. In this regard, my calculations take into account the well-known equation, noting that demand is net of recycling:

Stock = (Imports - Demand) – Exports.

The most extreme example of regional platinum import and export dislocation relates to China. China only imports platinum and does not export platinum. The above-ground inventory in China is widely accepted as being a 'black hole' and such inventory is therefore not globally mobile. This above-ground inventory will likely build-up. This contrasts with the destocking (exports) and redistribution of platinum above-ground stocks between Europe, North America, Japan and the rest of the world.



My research implies that imports into China (and via Hong Kong into China as well) have exceeded demand since 2006 and gathered pace in 2009. Consequently, there is evidence of increased activity in investment in platinum either by the Chinese government and/or in investment holdings. The increase in the cumulative inventory in China occurred, at pace, and continued to do so until 2020, when my data capture ends.

My calculations imply that between 2009 and 2020 the cumulative forecast quantum of platinum above-ground inventory was around ~10moz. This forecast quantum of additional platinum demand is significantly different when taking into account Chinese imports instead of demand.

It therefore becomes obvious that should China continue increasing its inventory of platinum it will likely cause an upside price move from the medium to long term. Under these circumstances:

China would literally suck platinum continually out of the system, which will contribute to a tightening of the platinum market and put upward pressure on the price of platinum.

This scenario becomes strategically important should the supply of platinum from the South African platinum mining industry decline, and platinum and palladium exports from Russia to the West are blocked by UK/EU/US sanctions in response to their invasion of Ukraine. I note that six Russian refineries are no longer being accepted as Good Delivery by the London Bullion market. SFA (Oxford) reports Russia's share of global supply represents 37.5% palladium, 10.6% platinum and 9.7% of rhodium. The supply of Russian PGMs has become a critical concern to the markets, notwithstanding the loss in supply of other commodities, which include nickel and aluminium.

The loss in PGM supply from Russia will significantly impact the precious metals markets, in particular vehicle manufacturers. PGM prices have become volatile, the palladium price reached an intra-day all-time high of USD3,440.76/oz, platinum and rhodium reached USD1,161/oz and USD22,200/oz respectively (6 - 7 March 2022). It is expected that this volatility will continue depending on the future outcome(s) of the current situation. I suspect that any resolution to the invasion of Ukraine by Russia and associated implementation of sanctions will extend into the longer term. Under these circumstances, the price of PGMs and commodities will remain volatile and high.

Impala Platinum's Nico Muller, indicated that it has limited capacity to plug the gap in the market left by Russia's platinum and palladium supplies. A key question therefore arises: How will the gap left by Russia's platinum and palladium supplies be filled, if at all? It is very unlikely that this gap will be closed by the South African platinum mining industry, which is indeed the biggest global platinum producer. As a consequence, the market has already experienced increased volatility and high PGM prices.

In this review, I will therefore demonstrate the strategic importance of estimating above-ground inventory, both globally and by region, and in particular using the quantum of Chinese imports as a prime example.

Note: in this research I rely on an audited global trade database compiled by the United Nations Comtrade International Trade

Statistics Division (UN Comtrade Data). This database provides information on annual imports and exports of platinum by country. For comparative purposes, I also rely mainly on platinum demand data published by Johnson Matthey and Metal Focus, SFA (Oxford), the World Platinum Council (WPIC) and Heraeus. UN Comtrade information on platinum classifies platinum into two categories: Unwrought or in powder form: Ingots and sponge, or in semi-manufactured forms: bars, rods, wire and sections; plates; sheets and strips of a thickness, excluding any backing, exceeding 0.15mm, flake, pellets, mesh, foil and tubing, among others.

In this regard, both categories should be taken into account when calculating the quantum of platinum imports and exports. Note, it is apparent that every country in the UN Comtrade database records imports and exports in semi-manufactured forms.

What do my assertions mean?

In this analysis, I initially focus on obtaining evidence from the literature that supports and adds credibility to my assertions. Recent articles published by the WPIC and Heraeus provide substantive evidence.

WPIC Platinum Perspectives (February '22), commented that "China's platinum imports have been continuing to run well ahead of identified demand, with 'excess/unexplained' imports totaling ~1.3moz in 2021, well in excess of the estimated global platinum surplus of 769koz. Without an identified end use, the flow of excess China imports is not captured in our supply/demand analyses. yet falling NYMEX stocks are".

These comments by the WPIC imply a build-up of above-ground inventory. Trevor Raymond (WPIC) said in a recent interview with Mining Weekly (9 March 2022): "We don't yet have the China import data for January 2022, but it certainly looks like that with elevated lease rates, and the reduction in NYMEX stocks suggests that China will continue to import more than it uses. A very big driver that puts a 'bit of a contradiction' into a market that's in massive surplus, yet the market is tight."

These statements go a long way in supporting my assertions regarding the importance of assessing estimates of import data when forecasting market balance trends and the platinum price.

Heraeus recently commented in its precious metal appraisal No. 6 (28 February '22) that "opportunistic platinum purchases from China

resulted in record imports last year. Trade data show that exports of platinum to China and Hong Kong reached a record of 2.9moz in 2021. Chinese buying increased significantly in August and December when the platinum price fell below USD1,000/oz. The imports were higher than estimated demand of 2.4moz but now that the price is rallying imports could drop back while the stock is used".

Again, these comments by Heraeus imply a build-up of above-ground inventory in 2021 and, once again, support my assertions. However, Heraeus also implies a decline in inventory given a rallying platinum price, which I agree with.

It is interesting to note that there is a large variation in the quantum of 'excess' platinum imports over and above demand between research organisations. The WPIC reports, in 2021, a quantum of excess platinum of around 1.3moz, whereas Heraeus reports a quantum of excess platinum of around 0.5moz in the same year. This large variation may boil down to a 'definition problem' regarding the category (form) of platinum used in their import calculations: Unwrought or in powder form: Ingots and sponge, or in semi-manufactured forms: among others. In this regard, it makes sense for both categories should be taken into account when calculating the quantum of platinum imports and exports.

What do my assertions mean, noting that this is a global phenomenon? In my view, they mean that research organisations, the market, the platinum mining and manufacturing industry and analysts alike have not adhered to the basic equation surrounding the increase or decrease in stocks: (Stock = (Imports - Demand) - Exports). The industry has assumed that platinum imports are equivalent to demand. Under these circumstances, the current published market balance estimates of global platinum implies that platinum is in a significant market balance surplus; however, this is not reflected by market fundamentals which are 'tight'. If imports are taken into account, the market balance is quite clearly flipped into a significant deficit!

The platinum industry clearly faces a conundrum in the way the market balance should be calculated. The market, industry and investors rely heavily on market balance trends, together with market fundamentals. In this regard, I contend that the current supply-and-demand data may be particularly misleading.

On a regional basis, with the destocking (exports) and redistribution of platinum above-ground stocks, combined with additional platinum demand, my calculations imply that between 1993 and 2019 stocks in Europe were in continuous decline, and have become worryingly low, in my view, despite being the global hub of platinum imports. Europe acts as a global conduit for platinum and has been consistently drawing on its stocks to maintain its current export demand (2019). Japanese stocks declined between 2003 and 2012 and thereafter began to increase at a moderate pace. North America has continuously built-up its platinum above-ground stocks over this period and by my estimates this is of a similar quantum to that of China ~10moz.

Estimates of above-ground Platinum inventory.

The market faces an additional conundrum when considering the quantum and availability of above-ground stocks. The WPIC initially defined above-ground stocks as:

'The year-end estimate of the cumulative platinum holdings not associated with exchange-traded funds, metal held by exchanges or working inventories of mining producers, refiners, fabricators or end-users. Typically, unpublished vaulted metal holdings from which a supply-demand shortfall can be readily supplied or to which a supply-demand surplus can readily flow."

This quantum, however, of unpublished vaulted metal holdings is unknown and therefore represents a problem when considering the availability of above-ground stocks. In this regard, the WPIC changed its definition of above-ground stocks to:

'The year-end estimate of the cumulative platinum holdings not associated with exchange-traded funds, metal held by exchanges or working inventories of mining producers, refiners, fabricators or end-users."

This definition focuses on the 'market balance estimates', for example, the WPIC reported that the above-ground platinum stocks in:

2018:

"The market had a surplus of 645koz last year, which increased above-ground stocks to 2,815koz by the end of the year. With a surplus of 680koz forecast for 2019, this will result in above-ground stocks reaching 3,495koz at the end of 2019 and exceeding 3moz for the first time since 2013."

2019:

"Our estimate of above-ground stock at 31 December 2019 is 3,532koz. Global platinum demand in 2020 is expected to fall short of supply generating a market surplus of 119koz. This will result in above-ground stocks of 3,651koz at the end of 2020."

2020:

"With the market deficit of -932koz in 2020 above-ground stocks fell to their lowest level since 2014, standing at 2,630koz at the end of 2020."

2021 Q3:

"While lower than 2021 by 132koz, the market is expected to remain in a surplus of 637koz in 2022, which will result in above-ground stocks increasing to 4,056koz, just short of 6.5 months of demand cover."

In my view, the calculation is correct according to the WPIC's definition; however, as indicated, the industry does not report any excess in platinum imports and export data over and above supply-and-demand forecasts. The definition is therefore 'somewhat

confusing' in my view, and I suspect, also ostensibly confusing to the global market as well.

I contend that the global above-ground stocks are significantly higher than reported.

Chinese inventory.

Clearly, platinum imports and exports are closely related to supply and demand. Furthermore, this relationship is likely to contribute to a 'tightness or weakness' in platinum demand which will impact the price of platinum.

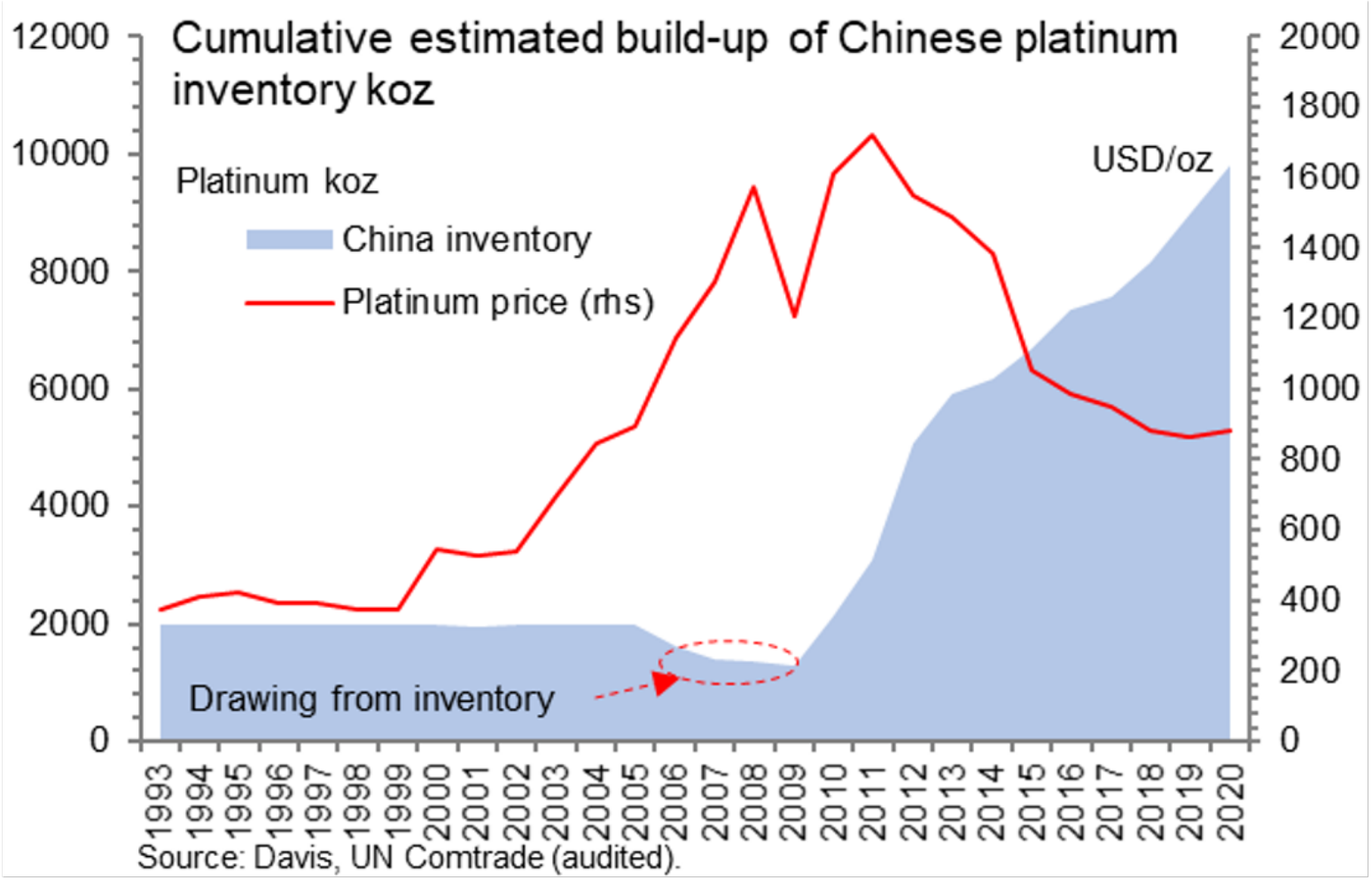
The most extreme example of regional platinum import and export dislocation relates to China. As indicated, China only imports platinum and does not export platinum. Under these circumstances, the above-ground inventory in China is not globally mobile.

In my view, three key questions arise from this scenario: **How long has China been increasing its inventory over and above the reported demand? What is the quantum of platinum attributed to this excess? Will China continue increasing its inventory?**

My research implies that imports into China (and via Hong Kong into China) have exceeded demand since 2009; consequently, there is evidence of increased activity in investment in platinum either by the Chinese government and/or in investment holdings. The cumulative increase in inventory in China occurred, at pace, and continued to do so through to 2020, when my data capture ends.

My calculations imply that between 2009 and 2020 the cumulative forecast quantum of platinum above-ground inventory was around ~10moz. This forecast quantum of additional platinum demand is significantly different when taking into account Chinese imports instead of demand.

The graphic below, illustrates the estimated quantum of the cumulative build-up of platinum inventory. It is noted that platinum was drawn from above-ground stocks between 2005 and 2008, which coincides with high platinum prices and the global financial crisis.



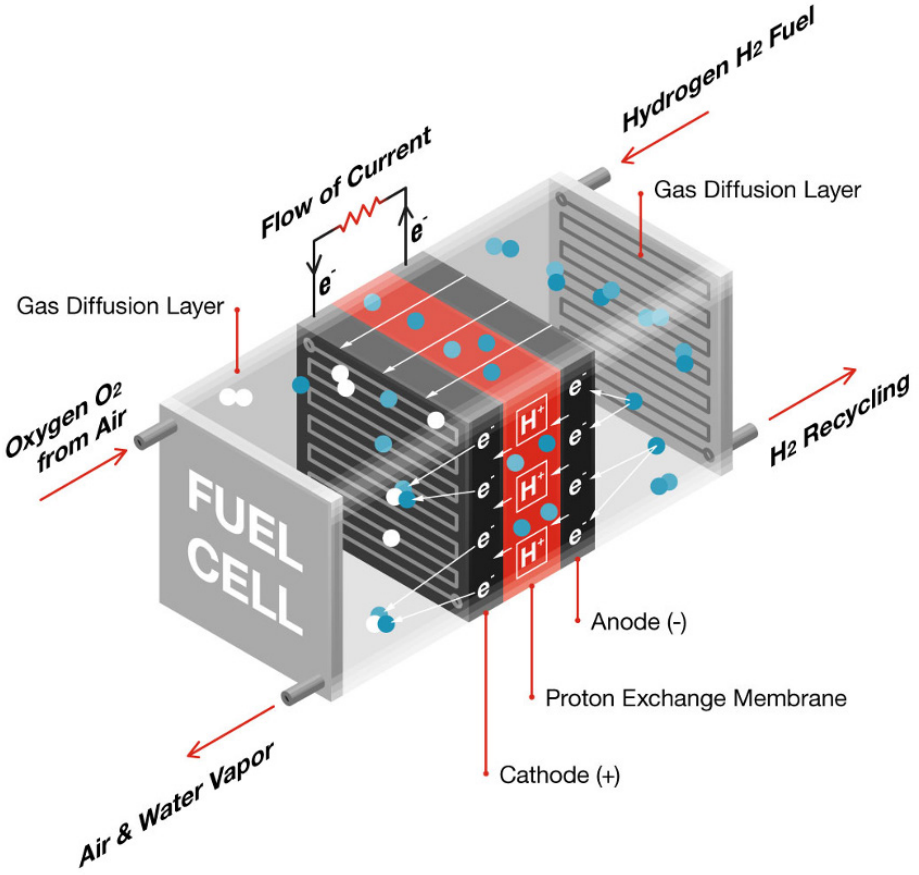
The additional demand was fuelled by a number of factors with the platinum price being the underlying factor. However, additional factors have also had an influence over this time period. For example, the gross demand for platinum jewellery in China increased by 16% in 2012 to 1.95moz, second only to the record 2.08moz bought in 2009. This was driven by continued retail expansion and stocks (JM). In 2014, PGM supply declined by a least 750,000oz from South Africa platinum mines through industrial action, safety stoppages and mine closures. This decline in supply together with heightened jewellery demand put the platinum market balance into a deficit.

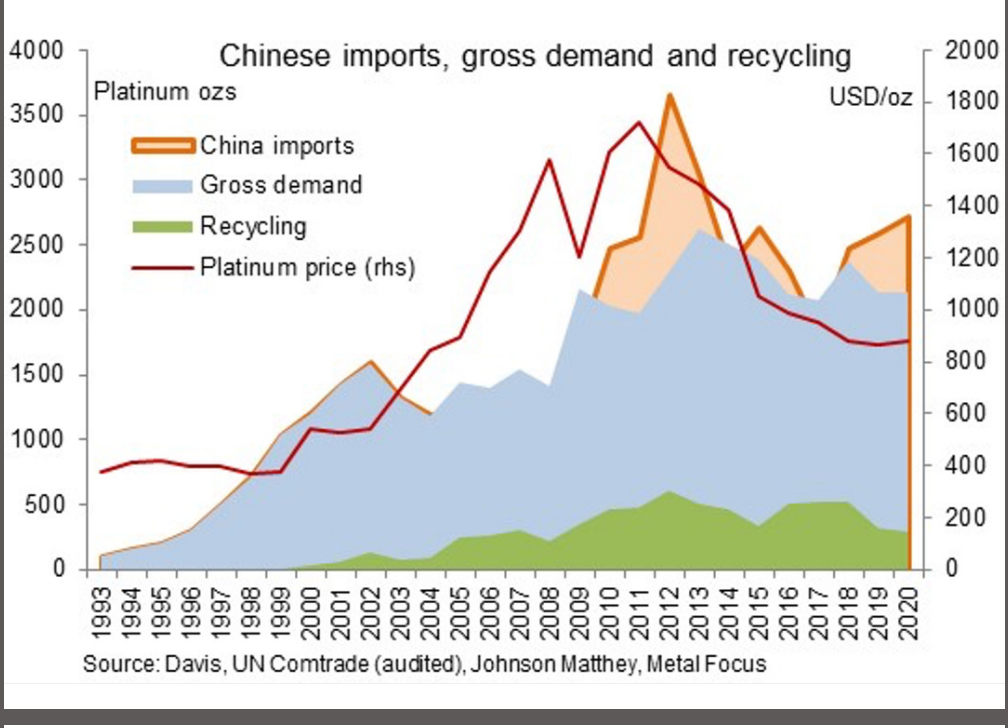
Also, vehicle emission standards have been progressively tightened through worldwide regulation since 1970. In response, vehicle manufacturers have had to increase the content (loading and load ratios) of platinum, palladium and rhodium (PGMs) in autocatalysts to meet these stricter limits, especially for heavy-duty vehicles (HDV). The additional quantum of PGM autocatalyst loadings is significant despite the expected increase in battery electric (BE) vehicles.

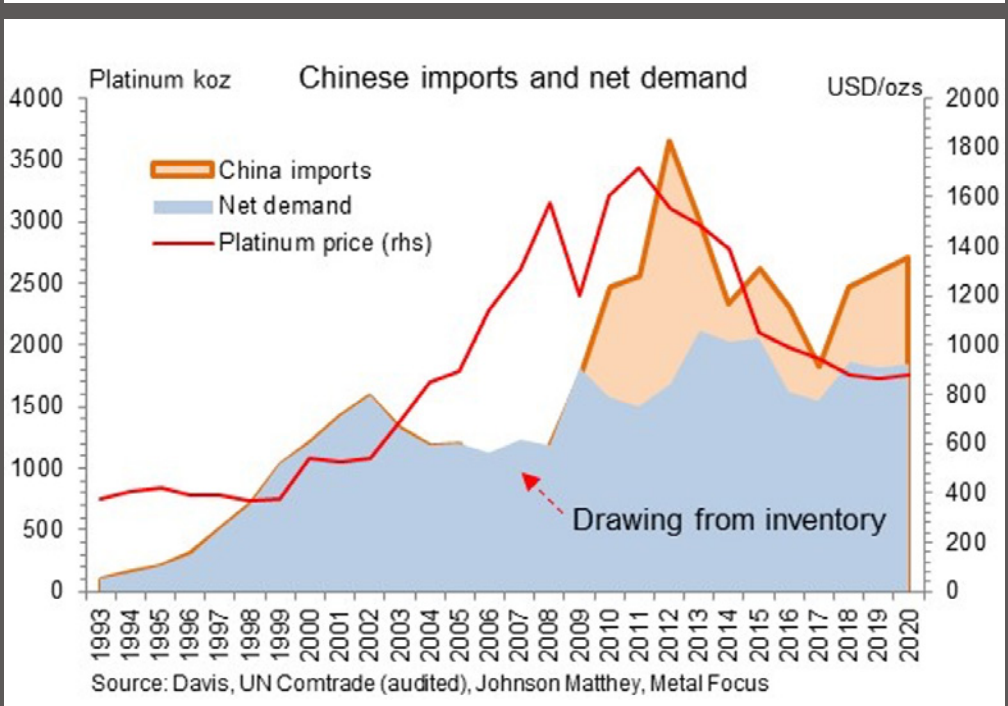
Future platinum demand will stem from the additional quantum of PGM autocatalyst loadings and the rapid development of hydrogen fuel cell and green technologies. Furthermore, price mismatches between palladium and platinum have driven vehicle manufacturers to substitute palladium for platinum in petrol-driven combustion vehicles.

Under these circumstances, it is 'not surprising' that China will likely continue adding to its platinum inventory. In my opinion, the projected increase in global demand for platinum answers the third key question above: Will China continue increasing its inventory?

It therefore becomes obvious that should China continue increasing its stock (inventory) activity, it will likely become an upside price risk in the medium to long term, as China would literally suck platinum out of the system, which in turn would further contribute to a tightening in the platinum market, which would put upward pressure on the price of platinum.







Connecting above-ground stocks, imports and demand trends.

In this review, I have argued that supply-and-demand forecasts do not give a complete picture of the platinum industry. I am of the view that my estimates of import and export data together with estimates of above-ground inventory provide additional and important information to take into account when forecasting the platinum price.

I attempt to illustrate the relationship between Chinese estimates of above-ground stocks, imports, demand, recycling and the price of platinum by integrating the annual estimates of these factors between 1993 and 2020. The results of this exercise are presented in the graphics opposite.

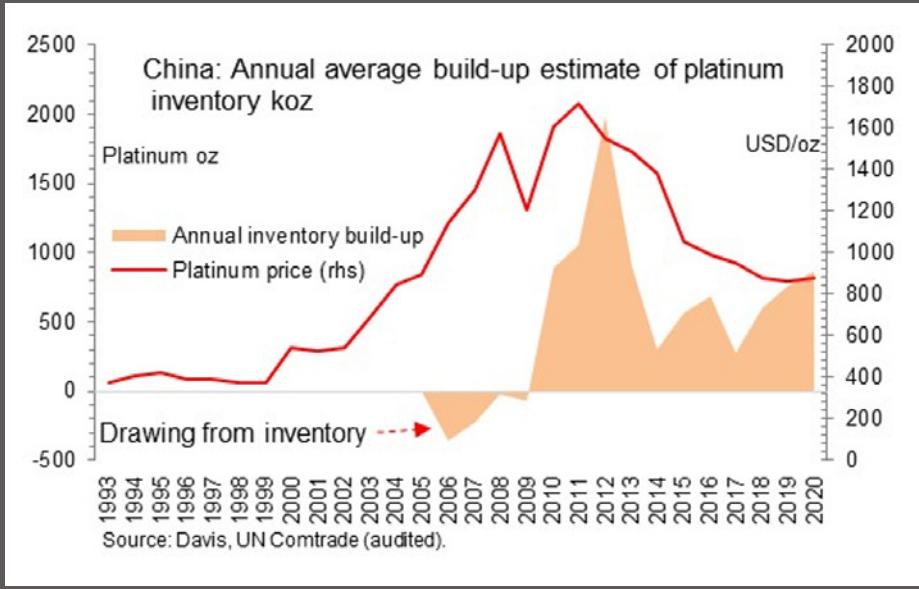
These graphics illustrate trends associated with imports, gross and net demand and the price of platinum respectively.

I argue that that there is a strong coalescence between imports, demand and price. Note that the graphics have been generated from two independent sources. The graphics also imply that platinum was drawn from above-ground stocks between 2005 and 2008. Thereafter, between 2009 and 2020, China imported more platinum than it used, thereby building-up inventory on an annual basis.

I contend that these illustrations answer the first key question above: How long has China been increasing its inventory over and above the reported demand? My calculations imply >11 years.

It should be noted that the platinum demand data was collated from Johnson Matthey and Metal Focus' published historical records.

To answer the second key question above: What is the quantum of platinum attributed to this excess? I have presented a graphic below, which illustrates the calculated annual estimates of the quantum difference between platinum imports and demand (2005 to 2020).



The annual estimates exhibit high volatility ranging from around ~0.3moz to ~2moz, fuelled by a number of factors, the platinum price being the underlying factor.

Given the high volatility of these estimates, my calculations imply that the average annual change in inventory was around ~0.6moz.

I argue that the graphics above confirm the connection between platinum above-ground stocks, imports and demand trends. This is an important exercise as the outcomes go a long way in support of the assumptions made in this report.

Furthermore, I contend that the results of this exercise also go a long way to completing the bigger picture of the platinum industry by providing a link, the 'missing link' of excess platinum, between an estimate of the quantum of platinum imports and demand data which has been independently calculated.

Strategic mining risks.

In this review, I demonstrate the strategic importance of estimating above-ground inventory, globally and by region in particular. Global Platinum mine supply is heavily dependent on supply from South Africa (~72%) as well as Russia (~12%). Supply from North America (~6%) and Zimbabwe (~7%) are small in comparison. This distortion in regional supply distribution becomes strategically important should the supply of platinum from the South African platinum mining industry decline and platinum and palladium exports from Russia to the West are blocked by UK/EU/US sanctions in response to the invasion of Ukraine by Russia. In this regard, both these regions are a PGM supply risk.

It is noted that almost every global mining company faces a large number of risks at varying levels. Some of these include operational and high-impact risks such as the Covid-19 pandemic and climate change.

The South African PGM mining industry is not secure.

The industry has faced numerous challenges in the past with the combined effects of electricity shortages, increasing costs as well as prolonged industrial action and heightened community action. The industry has also been starved of expansion and ore reserve replacement capital for a number of years. The investment and political climate are not conducive to the commitment of large amounts of capital in South Africa and there is a distinct lack of appetite from investors. That being said, it will take at least 5 to 10 years to ramp up new PGM capacity, if capital were indeed freely available.

Miners began to invest in reserve replacement in 2021. This quantum of investment is however, unlikely to stave off the overall decline in platinum supply or return the platinum markets to surplus any time soon.

Looming energy crisis.

At this stage of the conversation, it is important to put into perspective the potential impact of the looming energy crisis on South Africa's platinum mine supply. I believe that load shedding will widen significantly over the next five years, caused mainly by 'slippage' in the new build programmes (three to four years at least) and capital constraints. Together with political interference, meddling and vacillation with respect to the recovery plan, this will likely cause a further increase in PGM supply losses. PGM supply from South Africa has already happening, as the frequency of higher stages of load shedding are enforced as Eskom's ageing power stations prove increasingly inefficient.

Furthermore, the CEO of Eskom, André de Ruyter, has indicated a further risk to its transmission infrastructure. This risk is associated with its ageing infrastructure and insufficient transmission infrastructure, especially in the west of the country. De Ruyter indicated that transmission lines take about 7 years to build and an estimated R117.8bn (USD7.98bn) will need to be invested in 8,000km of transmission lines. In my view, this additional transmission comes close to putting the final nail in the coffin as far as Eskom's ability to achieve its plan in a timely manner is concerned.

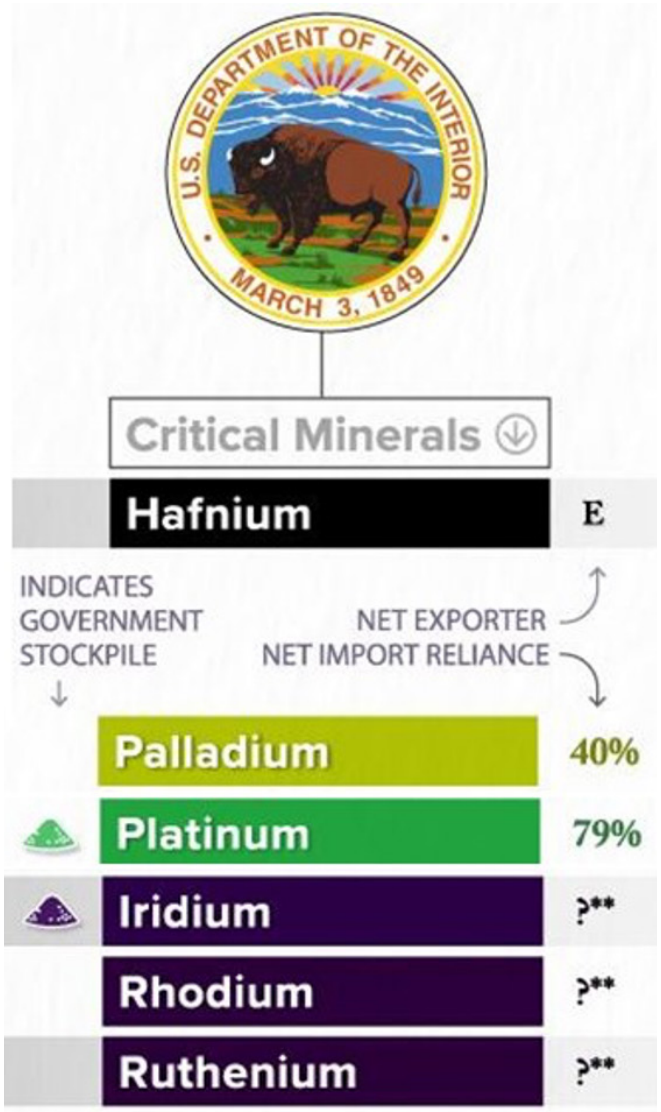
What is the quantum of platinum imports into China from and South Africa and Russia?

According to UN Comtrade Data (audited) in 2020, China imported around ~60% and ~16% or 1.6moz and 440koz from South Africa and Russia respectively, consisting of bars, sponge and semi-manufactured platinum (Demand Data, JM). I am of the view that much of Chinese imports from South Africa goes via a third party.

How will the gap left by Russia's platinum and palladium supplies be filled, if at all?

I note that China has not applied any sanctions on Russia. This essentially leaves China likely to absorb additional platinum and palladium to build-up its inventories. At the same time, South Africa could boost supply, though highly unlikely. Reuters reports that Sibanye-Stillwater has indicated it has very little flexibility to increase production in 'any material way'. This is not a quick fix and will generally stake months if not years before the benefits become apparent. The CEO of Impala Platinum, Nico Muller, indicated that it has limited capacity to plug the gap left by Russia's platinum and palladium supplies.

A key question therefore arises: How will the gap left by Russia's platinum and palladium supplies be filled, if at all? It is very unlikely that this gap will be closed by the South African platinum mining industry, which is the biggest global platinum producer. As a consequence, the market has already experienced increased volatility and high PGM prices.



Source: US Department of Interior, US Geological Survey

Regional above-ground inventory.

In this discussion, I attempt to demonstrate the strategic importance of estimating above-ground inventory, globally and by region in particular. On a regional basis, with the destocking (exports) and redistribution of platinum above-ground stocks, combined with additional platinum demand, my calculations imply that between 1993 and 2019 stocks in Europe have been in continuous decline. In fact they have become worryingly low, in my view, despite being the global hub of platinum imports. Europe acts as a global conduit for platinum, however, it has been consistently drawing on its stocks to maintain its current export demand (2019). Japanese stocks declined between 2003 and 2012 and thereafter began to increase at a moderate pace, North America has continuously built-up its platinum above-ground stocks over this period and by my estimates is of a similar quantum to that of China: ~10moz. It is not clear how much of the estimated quantum of North America above-ground platinum stocks, of around ~10moz (2019), has been allocated to the government stockpile. The table opposite lists the PGMs deemed essential to the US economy and national security. This was released on 22 February 2022 and lists the PGMs deemed essential to the US economy and national security. The table indicates that the US relies on 79% of net imports of platinum.

What does this scenario mean with respect to regional above-ground platinum stocks?

As indicated, it is very unlikely that the supply gap left by Russia's inability to export PGMs will be closed by the South African platinum mining industry, nor by the North American PGM mining industry.

So, what's left?

A drawdown of regional platinum above-ground stocks? In this regard, the strategic importance of estimating above-ground inventory by region becomes apparent. As indicated, North America has by far the largest regional stock. I contend that North America will only dip into its above-ground inventory at a price.

Gold Stackers Australia Pty Ltd.
Level 8, 227 Collins Street, Melbourne VIC 3000

About Dr David Davis PhD. MSc. MBL. CEng. CChem. FIMMM. FSAIMM. FRIC.

David has been associated with the South African mining industry and mining investment industry for the past 45 years (mainly PGM, gold and uranium). At present, David is working as an independent precious metal consultant. David's PhD involved: "Studies in the catalytic reduction and decomposition of nitric oxide 1976".

Dr David Davis Certification

Dr David Davis attests that the views expressed in this report accurately reflect his personal views about the global Platinum Industry. Dr David Davis does not hold any interest or trading positions in any of the Companies mentioned in the report.