



## **Quintessentially PGMs**

**A report by Nornickel, with  
financial market analysis  
from ICBC Standard Bank**

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**NORNICHEL**

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## **Quintessentially PGMs**

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## GLOSSARY OF TERMS

Abbreviation	Term
ADAC	Allgemeiner Deutscher Automobil-Club
BEV	Battery electric vehicle
CAAM	China Association Of Automobile Manufacturers
CF	Conformity factor
EREV	Extended range electric vehicle
ETF(s)	Exchange traded funds
EV(s)	Electric vehicles
FTP	Federal Test Procedure
GPF	Gasoline Particulate Filter (GPF)
HDD	Heavy-duty diesel vehicle
hp	Horsepower
ICE	Internal combustion engine
koz	Thousand troy ounces
LBMA	London Bullion Market Association
MOz	Million troy ounces
NCC	Net cash cost
NMOG+NO <sub>x</sub>	Non-methane organic gas plus oxides of nitrogen
NYMEX	New York Mercantile Exchange
OEMs	Original equipment manufacturers
oz	Troy ounce
PGM(s)	Platinum group metals
PHEVs	Plug-in hybrid electric vehicle
RDE	Real driving emissions test
USD	US dollar
VAT	Value added tax
WLTC	Worldwide harmonized Light vehicles Test Procedure
YTD	Year-to-date
ZAR	South African rand

## KEY TAKEAWAYS

**Palladium** mine supply is expected to increase by 0.3 MOz in 2019 as a result of pipeline stocks processing in South Africa. Improved Nor Nickel's performance as well as growing scrap collection, although not so robust as a year ago, should also contribute to further supply expansion.

Palladium demand in 2019 is growing at a higher pace than supply due to the introduction of new environmental regulation around the world (China 6 and VI, Tier 3 in the US, Euro 6d in the EU, Bharat 6 and VI in India) offsetting the slowdown in the automotive output. Despite the weakness seen in Q1 2019, vehicles output is expected to start growing in H2 2019 again as Chinese economic leading indicators show the signs of improvement.

Production is likely to stay behind consumption for the next 3-4 years but eventually, the market will be balanced with new mine projects as well as growing scrap collection.

Currently, there is little appetite for substitution of palladium with platinum as OEMs are still trying to meet the requirements of the new regulation in the more demanding environment of real driving test implementation.

Palladium	2018	2019E
Demand excl. investment	+0.16 MOz +1.6%	+0.50 MOz +4.7%
Supply excl. stocks sales	+0.20 MOz +2.1%	+0.36 MOz +3.5%

**Platinum** supply is expected to recover after a 2018 decrease primarily due to growing production in South Africa. Weak rand and higher credits for palladium and minor PGMs make most mines profitable in rand terms delaying announced shafts' closures. However, the work-in-progress material accumulated in 2018 will also be delivered this year. On the other hand, labour unrest in South Africa can flare up during the wage negotiations this year and may significantly impact platinum supply side. The recent Sibanye-ACMU deal to end strike at gold mines without any remuneration concessions suggests that mining companies would likely have a strong negotiation position.

Demand growth is still lagging behind supply due to weak consumption in the automotive industry and jewellery sector in China. The offtake in other industries (electronics, chemical, and glass) shows remarkable growth. Modern diesel cars meet all environmental requirements and a renaissance of this technology might happen in the near future.

The surplus of production is almost fully absorbed by investment demand spurred by lower than the historical averages price levels.

Platinum	2018	2019E
Demand excl. investment	+0.06 MOz +0.7%	+0.03 MOz +0.4%
Supply excl. stocks sales	+0.04 MOz +0.5%	+0.34 MOz +4.1%

## MARKET SENTIMENT

Since our previous report in November, **palladium** became one of the most popular news headlines in the world of commodities. Its spectacular rally carried on from August 2018 until 21<sup>st</sup> March 2019 when the price reached the new all-time record of USD 1604/oz.

This price movement was one of the manifestations of a long-lasting fundamental trend observed since 2016, ignited by the lack of the metal available for spot purchase as a consequence of a persisting market deficit.

The relatively low level of speculative positions shows that the rally was primarily driven by physical market tightness. After a rapid increase in September-November, speculative net-long positions in NYMEX remained stable at 1.3-1.4 MOz<sup>1</sup> – much lower than the figures seen in the beginning of 2018 (2.7 MOz).

Tight supply pushed lease rates higher with spikes in August 2018<sup>2</sup> and later on in December 2018 – January 2019 when the rates were close to 30%. Speculations around Fiat Chrysler decision to recall nearly 1 million vehicles with dysfunctional catalytic converters that require nearly 100 koz of palladium as well as exaggerated concerns over the Russian ban on precious metals' scrap and semis export have also added some fuel to the fire.

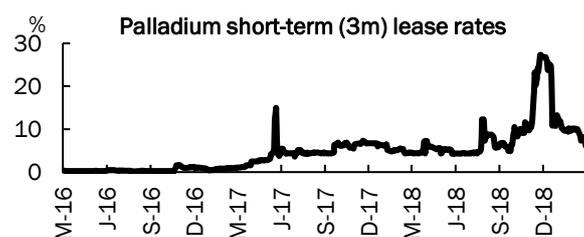
The rally was interrupted in late March when palladium price fell by nearly 200 USD/oz in just two days. This correction was caused by a number of factors resulting in a short-term perfect storm. First of all, the speculative liquidation was triggered by Mark Cutifani's words about "the bubble in the palladium market", which were misinterpreted by the market, but we see this more as a pretext while the root causes were linked with temporary volatility in demand and supply.

Elevated lease rates in the beginning of the year pushed industrial users and other customers into buying palladium in order to reduce the unprecedentedly high burden of leasing. By the end of the first quarter, this additional demand was mostly met, the upward pressure on prices was reduced and lease rates adjusted down, although the metal still remained backwardated.

Among other reasons for the sell-off, additional refined metal supply coming from secondary sources and, probably, South African producers who accumulated excess work-in-progress material in 2018, could be named.

There were also some externalities impacting the price, like fiscal year ending in March in some countries (e.g. Japan), which forced market players to liquidate their long positions in order to fix profits and get cash for paying taxes. Others sold physical stocks as a way to decrease their hedging expenses and improve the balance structure.

Taking into account small NYMEX trading volumes in palladium (in comparison with the assets under management operated by hedge funds and high-frequency traders), excess short-



Source: Reuters, Company data

<sup>1</sup> Since December until mid-March 2019

<sup>2</sup> See our November 2018 report for more details regarding this market movement



term supply and a seasonal reduction in industrial demand, we witnessed an avalanche of stop-loss orders.

However, after a couple of days of elevated volatility, palladium price consolidated at USD 1350-1400/oz proving that the fundamentals were still favouring the metal. Positive China data published in the beginning of April as well as higher global equities were providing additional support in the beginning of Q2 2019.

Palladium substitution with platinum, which some speculative players assume a reality, is quite challenging technically as well as money- and time-intensive. So far, we do not see any sign that it could be coming in the mid-term<sup>3</sup>.

Platinum price was edging higher in Q1 2019 backed by a significant increase in investment demand (ETFs gained nearly 0.7 MOz YTD) and pushing supply/demand balance into the deficit. Fed's desisting a rate increase

was also beneficial for the whole range of precious metals, especially gold and platinum.

It seems speculative investors had been also changing their attitude towards platinum as they noticeably decreased NYMEX shorts from 2.5 MOz in late January to less than 0.9 MOz by the end of April.

The fact that demand lags behind supply is already reflected in the price and the chances for the upside are rising. Automotive industry and other lobbying institutions intensified their efforts to recover the image of diesel in the eyes of the consumers and authorities. It seems that this investment starts to pay off. Other industries (electronics, chemistry, glass) show a sustained platinum offtake growth and, if the current investors' attitude persist, we may see platinum market in deficit as early as in 2019.

## GLOBAL PGM DEMAND

### AUTOMOTIVE

**Total automotive production, including heavy-duty vehicles, contracted by 0.5% in 2018** primarily as a result of the Chinese market slowdown, which fell by 4% Y-o-Y. The drop in China accelerated in Q4 on the back of growing pessimism around the trade war and global trade perspectives. Our previous report was based on October figures and by then, we believed that the Chinese automotive market slowdown would not lead to an annual decline. However, the year ended with a more significant landslide in the Chinese automotive market than we had expected.

We have downgraded our estimate of palladium consumption in automotive industry by 0.1 MOz to 8.6 MOz in 2018, but it is still +2% Y-o-Y. Worse than expected global automotive production was more than offset by growing metal loadings as a result of tighter emission regulations. The positive dynamics are indirectly confirmed by the trade statistics: net-import of refined palladium to countries with catalyst-producing plants increased last year - China and Hong Kong +20%, Japan +5%, Germany +6%, North Macedonia +22% Y-o-Y, Poland +57%. Among major palladium-consuming countries, the US was the only one where net-import decreased by 17%, but this can be explained by the previously elevated import volumes in 2016-2017.

Our estimate of automotive demand for platinum remains unchanged at 3.2 MOz in 2018 (-4% Y-o-Y) as diesel markets (both European light-duty diesel and global heavy-duty) has not been significantly impacted by the Q4 slowdown.

**Automotive production in 2019: a weak start, but improvement is possible.** First published results (full data are currently available for January-March only) show a remarkable decrease in automotive sales (globally -5% Y-o-Y) with negative dynamics in China (-11%), North America (-3%) and Europe (-2%). Meanwhile, March results look better than the January ones, giving some hope for a possible recovery.

**When China sneezes, the global economy catches a cold.** The second half of 2018 was the time of uncertainty regarding the future of the global growth as the risk of trade war between the US and China had threatened the Chinese economy. Since our previous report, the flood has receded and there are positive signs that a trade deal

between the US and China could be reached. The latest announcements that China will delay the introduction of additional import taxes on vehicles originating from the US shows that Beijing takes a co-operative stance.

Moreover, since October, Chinese government has been implementing a range of measures to avoid hard landing in case of no-deal. The reasons for optimism include a reform of VAT (the tax on industrial goods was reduced from 16% to 13% and on transportation from 10% to 9%), which is expected to reduce the tax burden by 2 trillion yuan (USD 300 billion) annually, and other measures to bring down the cost of borrowing and support private sector and car sales in rural areas. It will take some time for this additional liquidity to transform into consumers' confidence and influence automotive sales but we might see the impact in Q2-Q3 2019 already.

The decision to slash EV subsidies by nearly 75% and to ban local support of the EV market will also have some positive impact on the PGM consumption in the country (BEV share there reached 3.5% of production last year). Recent news suggest that the US and China are nearing an agreement to end their trade war. If it happens, it should improve consumers' sentiment in China significantly and in that case, we believe that global automotive output can return to growth by the end of this year.

In our view, despite an 11% decline in Q1 2019, a 1% Y-o-Y growth in China is still possible this year. This opinion is backed by the forecast of China Association of Automobile Manufacturers (CAAM) – official union of automakers in China – who predicted in April a 3% market growth this year, with sales turning positive year-on-year around July and August. According to CAAM, the VAT cut should drive production and employment, so an effective implementation of this policy can bring recovery to the market. LMC Automotive also forecasted in March 2019 that China's auto market would see some growth in the Q3 further accelerating in Q4 with an annual increase of 1% Y-o-Y.

**The US have not been a major driver of the recent volatility,** automotive sales have been relatively stable there in recent years, with the modest dip in January and February unwinding in March. The Fed's dovish decision to delay a rate increase gives a sign that the period of fast growth for the US economy is over. However, this step also eases headwinds the automotive industry is facing by

<sup>3</sup> A detailed analysis is available in our previous reports published In April and November 2018

providing the economy with additional liquidity and making loans cheaper. A boost in household sales, lower lending rates, strong labour market, wage growth, improving consumer sentiment in March indicate that the US automotive market may recover soon. The decline in sales seen in the Q1 may be also attributable to the high base of Q1 2018, which was stronger than normal.

**The European economic outlook has been raising concerns since the end of 2018.** The latest data on manufacturing published by France and Germany indicate a slowdown, although the PMI index is still above 50. Experts believe that much of the weakness in manufacturing has external origins – it reflects global trade tensions and a slower pace of the global economy growth. European Central Bank is trying to deal with stagnation by prolonging the period of low interest rates, and it looks like the ECB still regards the Eurozone’s economy to be in a good shape with lower unemployment and wage growth, but it is questionable whether it can be sustained in the long run. Meanwhile, lower automotive sales in the region can be explained by the higher base in H1 2018 when sales peaked ahead of the WLTP introduction in September and subsequently fell dramatically.

**Growing loadings are offsetting lower vehicles output.** Despite the clouds gathering around the global automotive output in Q1, PGM demand has a reliable cushion in a form of the stricter environmental regulations, which are coming into force in the most important markets and pushing the OEMs to increase PGM loadings. China 6 Standard launch is scheduled for mid-2020 and is already providing a considerable boost to the PGM offtake this year as the industry requires additional metal across the whole autocatalyst fabrication value chain, which takes up to 6 months. Our estimates show that this year, palladium loadings in light-duty petrol (gasoline) vehicles in China will increase by 15...20% Y-o-Y and will continue to grow next year.

Moreover, implementation of China VI regulation for heavy-duty vehicles, which is going to be launched this year in Beijing and other main provinces and cities where the absolute majority of trucks is being sold, will also have a significant positive impact on the Chinese PGM demand affecting not only platinum (which loadings are expected to triple this year) but palladium as well (+10...+15% Y-o-Y in loadings).

A similar picture can be seen in India where the new Bharat VI HDD regulation is coming into force in April 2020 and requires the OEMs to start their preparations not later than H2 2019. This standard, which is coming into force right after Bharat IV and skipping Bharat V, requires the automakers to reduce NOx emission by 25% for petrol (gasoline) vehicles and by nearly 70% for diesel trucks. Particulate matter emission is also to be reduced by 80% for diesel vehicles. The regulation introduces a RDE test, which makes meeting its requirements even more challenging. Bharat VI reduces permissible fuel sulphur content from 50 to 10 ppm, expanding the opportunities for wider palladium use (sulphur-rich fuel is reducing palladium catalysts’ performance).

In Europe, as a part of the final stage of Euro 6d, RDE NOx conformity factor (CF) of 2.1 is going to be set starting from September 2019 for all new vehicles. From January

2020, it will be reduced from 2.1 to 1.5 for the new models, while from January 2021 CF=1.5 will become a standard for all new vehicles. WLTP introduction in 2018 forced OEMs to conduct deep re-engineering of tailpipe systems and increase palladium loadings by more than 5% Y-o-Y depending on the vehicle type; and we forecast at least a similar growth this year.

**Palladium demand in automotive industry is not price elastic as a result of the ongoing test cycle evolution<sup>4</sup>**

							Driving Dynamics
NEDC	20-30°C	11km	20 mins	Max: 120km.h	0m	Min.	n/a
WLTP	20-30°C	23km	30 mins	Max: 131km.h	0m	TMH TML	n/a
RDE	-7°C to 35°C	Approx 90km	90-120 mins	Max: 160km.h	0-1300m	upto 90% mass	v <sup>a</sup> a <sub>pos</sub> 95 RPA

Source: Johnson Matthey

In the US, Tier 3 ruling will continuously effect PGM demand till 2025 as it sets more and more stringent fleet average NMOG+NOx standards each year. For instance, fleet average NMOG+NOx FTP standards were 79 mg/mi in 2018, then reduced to 72 mg/mi (-9% Y-o-Y) this year, and it will reach 30 mg/mi by 2025 – the level of SULEV-equivalent fleet average NMOG+NOx emission. This will require more than a 40% increase in palladium and 10% in rhodium over the current fleet averages.

**Automotive consumption scenarios in 2019.** Our base-case scenario is calculated on an assumption of a 1% global automotive production growth in 2019 with the Chinese market recovery of 1%, flat European and N. American output, as well as some expansion in Japan and India. This is generally in line with the latest LMC Automotive forecast. Based on this and taking into account a significant growth in loadings, we revise<sup>5</sup> our palladium consumption forecast downward by 0.3 MOz to 9.1 MOz in 2019. This means the offtake by the industry will grow by +0.5 MOz in comparison with 2018. Looking at sales figures for January and February, this scenario might look too optimistic, however even less bullish car sales projections still allow us to say that palladium consumption will continue to grow this year: assuming a flat vehicles’ output this year, we see palladium offtake at 9 MOz (+0.4 MOz Y-o-Y). Even in the case when the automotive production will decrease by 2%, we still would expect an increase by 0.3 MOz Y-o-Y. The strictest stress test suggesting the vehicles’ production will continue its decline with the same pace as in the beginning of the year (-7.5%) still shows palladium consumption to contract by only -0.2 MOz Y-o-Y – a relatively limited decrease, which is still leaving the market in deficit.

Global auto production growth in 2019, Y-o-Y	Palladium, MOz		Platinum, MOz	
	Consump. in 2019	Δ '19 vs '18	Consump. in 2019	Δ '19 vs '18
+1%	9.1	+0.5	3.2	0
0%	9	+0.4	3.2	0
-2%	8.8	+0.3	3.1	-0.1
-7.5%	8.3	-0.2	2.9	-0.3

Looking ahead, we assume the global economic growth will recover and automotive production will come back to the growth levels of 2-3% per annum starting from 2021. This would clear the path for the palladium automotive

<sup>4</sup> NEDC is a driving cycle used in Europe until 2017 (new models) / 2018 (all models). WLTP is a new driving cycle

introduced in Europe 2017/2018. RDE is a real driving emission testing introduced within Euro 6d, China 6, Bharat 6. <sup>5</sup> See the data presented in November 2018 report.

consumption to reach 1.1 MOz by 2025. As for platinum, our base-case scenario assumes the metal consumption in the automotive industry to stabilise this year at the level of 2018 (3.2 MOz) with the increase to 3.3 MOz by 2025 to follow.

**Silver lining emerges among the diesel clouds** despite the continuing slowdown in the EU diesel market. According to LMC Automotive, the diesel share of the new car sales in Europe was 35% in February, which is lower than a year ago (40%), but higher than in January (33%). The good news is that Volkswagen has reported that the share of incoming orders for diesel vehicles had risen from 39% in 2017 to 43% in 2018 and the demand for diesel cars was particularly strong among private customers where the share almost doubled from 15% in 2017 to 27% last year. In a statement, VW executive acknowledged that *“given ... its performance and in light of climate change, the diesel engine will remain an important technology for years to come, especially for those who travel long distances”*. Another good sign came from Fiat Chrysler whose CEO Mike Manley told Financial Times that the company might roll back their earlier pledge to eliminate diesel from its passenger cars in Europe by 2022 if public demand for the vehicles remained strong.

Significant efforts have been made to ensure that diesel cars are able to meet and often exceed future emissions standards. In Germany, testing by ADAC (national automotive union) has established that all Euro 6c and 6d-Temp vehicles that have been measured on the road to date meet much stricter NOx requirements than required by the EU. In the test, the cars have performed not only significantly below the tolerance value of 168 mg/km for diesel cars, which is applied on the road, but also below the current Euro 6 WLTC limit of 80 mg/km. It has also been found that some vehicles, like Mercedes C-Class 220d, emitted no traceable NOx, while other tested diesel cars produced incredibly low emissions. This news was widely reported by the European media and it seems that marketing and research efforts made by the OEMs and industry lobby have led to some changes in the perception of diesels by the customers and officials. Hopefully, it will facilitate re-balancing towards the technology with a lower CO<sub>2</sub> footprint in the new vehicles.

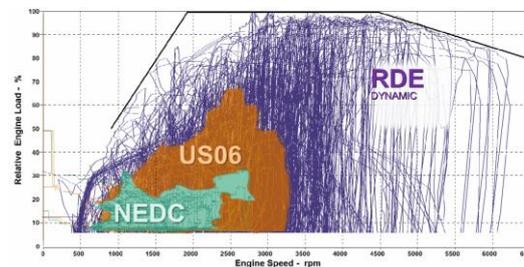
**Palladium substitution with platinum is not happening** because of the technological challenges and specific chemical properties of the metals, which are not fully interchangeable<sup>6</sup>. Our regular communication with the OEMs and fabricators reveals that currently, automakers have little appetite for changes in the catalysts chemistry as their engineering resources are focused on meeting new tighter emission legislation and RDE testing, and they do not have enough workforce to conduct new catalyst formulation testing. Introduction of RDE testing has raised concerns over non-compliance, so automotive producers want to be absolutely sure that the catalytic system is robust enough before they make a change.

However, fabricators admit that technically, it is possible to replace palladium in, firstly, Pd-rich diesel catalysts, which are widely used in North America, and, secondly, in gasoline catalysts albeit fractionally; but more development work is still needed to match the performance of the existing Pd-Rh systems. Moreover, only a small portion of palladium can be substituted in the

<sup>6</sup> See our April 2018 and November 2019 report for a detailed review of palladium and platinum catalytic features in contemporary engines.

close-coupled gasoline converters, which account for approximately ~70% of PGM content as platinum sinters in high-temperature environment. The weight substitution ratio is not determined yet.

**Engine load (%) and speed (rpm) within different testing cycles<sup>7</sup>**



Source: AVL List GmbH

After a very strong growth in 2018, which attracted enormous media attention, **electrification agenda is under pressure this year** raising doubts that the previous year growth rates could be seen again in 2019.

The most important move was made by the Chinese government in late March: they drastically reduced their subsidies for electric vehicles and barred provincial governments from subsidising these vehicles with the goal to terminate the subsidy program by the end of 2020.

Under the rules that took effect in late March, financial incentives for domestically built electric vehicles were cut by some 75%. According to the government, this step is intended mainly to prevent the automakers from relying on subsidies for sales and to curb local protectionism. The International Institute of Strategic Studies estimated that China had spent 245 billion yuan (USD 36.5 billion) in subsidies for electrified vehicles from 2009 to 2017; and now, it is questionable whether the EV industry would be able to continue its rapid growth without such a generous governmental support. This development can impact the global EV market significantly, as about 60% of the EVs produced globally in 2018 were made in China.

North America, the second-largest EV market, also faces the risk of the EV incentives' disappearance as the Republican representatives and senators introduced bills to repeal the USD 7,500 federal EV tax credit. In March, the Trump's administration announced a 2020 budget proposal, which also revokes the EV tax credit. The White House is proposing to rescind the USD 7,500 USD EV subsidy, claiming that it will save the government about USD 2.5 billion over the next decade.

At the same time, major US automakers have been lobbying the Congress to expand the credit that currently phases out after companies hit 200,000 vehicles sold. Tesla and General Motors both hit the 200,000 figure last year and the credit that the consumers receive for buying their EVs is falling proportionally to the number of vehicles sold, and it will completely disappear for the GM and Tesla buyers in 2020. If the government fails to expand the incentives, it will have a painful impact on the EV sales in the US.

In March 2019, the European Parliament finally approved the CO<sub>2</sub> emissions' reduction targets for 2021-2030 - by 37.5% for cars and by 31% for vans. This step is widely criticised by the automotive associations and OEMs as

<sup>7</sup> US06 is a driving cycle currently used in the US

being too demanding and likely harmful for the industry. Volkswagen Group's CEO warned that the EU's emissions target could make vehicles too expensive for some consumers as electrification of the cheaper models makes them much more expensive for the budget-sensitive groups. Another challenge for the intensified transport electrification is the effect on jobs in Germany and other European centres of the automotive industry where ICE-producing plants are located.

Moreover, Amnesty International criticised the electric vehicle industry in their March report for presenting itself as environmentally friendly while producing many of its batteries from polluting fossil fuels and unethically sourced minerals.

**Hybridisation is looking as the most profitable and practical way to address the new environmental legislation** (at least, until 2025) and the recent decision by Toyota to open up its 24,000 patents on hybrids may whip up the technology adoption. Depending on the level of hybridisation, this will require additionally up to +15% in PGMs loading per vehicle with the highest increase in PHEVs, which frequently operate with cold catalysts, and a moderate increase in mild and full hybrids.

On the other hand, the EREV technology, which is used in Nissan's eDrive vehicles, may be a solution to decrease the PGM use in hybrids. These vehicles are powered by ~30-40kWh battery but they are also equipped with a small ICE (~70-80 hp) which is used only to charge the battery. The ICE works in limited operating modes that allows to reduce the PGM usage per vehicle in comparison with conventional hybrids. Nissan Note ePower model is extremely popular in Japan with 136 thousand vehicles sold in 2018, which makes this model the top of all models. For comparison, Nissan Leaf BEV was #35 at 26 thousand vehicles sold; and the company believe they will be able to push ePower globally.

Preheated catalysts, which were considered by some analysts as the way to reduce the PGM dependency in hybrids or conventional vehicles, are going to be employed by the OEMs in order to meet the requirements of the RDE regulation rather than to decrease their PGM usage in catalytic converters, but the solution is still in an early-stage development.

Another technology, which is tested to reduce CO2 emission, is **lean-burn gasoline engines** operating with a leaner mix of fuel and air and therefore, consuming less fuel and producing lower levels of emissions because of the better combustion control and more complete fuel burning inside the engines' cylinders. Theoretically, in the chambers of such engines, the mixture can be burnt without a sparkplug like in diesel engines but the problem is that the gasoline mixture is not as stable as diesel and it can either fail to combust or combust during the wrong part of the cycle. These issues can be overcome by employing a highly efficient mixing process and traditional spark-ignition when required. Daimler has used this technology in a series of engine models and gained a 6-7% boost to fuel economy depending on the engine and vehicle type while Mazda has recently launched SkyActiv X engine employing a similar technology, which, according to Mazda's estimates, improves fuel economy by 20-30% in comparison with conventional gasoline engines.

The downside of the lean-burn technology is increased NOx emissions, which require precise direct fuel injection, sophisticated computer-controlled engine management systems, more complex engine design, and catalytic

converters. This makes this technology much more expensive than conventional vehicles and currently, most OEMs are following a global push toward hybrids, which potentially may offer even more significant CO2 reduction. However, the sales of Mazda's SkyActiv X vehicles have only started and we will monitor them closely as this technology can play a valuable role in reducing greenhouse gas emissions, at least in the mid-term.

## OTHER USES

**Chemicals.** Despite the deceleration of growth in China, which was believed to be a likely reason for the chemical demand slowdown in 2018, we saw another strong year with palladium consumption reaching the new record high of 0.49 MOz (+7% Y-o-Y) while platinum offtake in the chemical and petrochemical industries reached 0.86 MOz (+19% Y-o-Y) in 2018.

This industry's consumption is driven mostly by the Chinese efforts to achieve domestic self-sufficiency in basic chemicals. These investments had been made years ago and because of that, they should not be seen as a result of the latest macroeconomic uncertainty.

This year, palladium offtake is going to grow by 9% as it is spurred by the launch of new mono-ethylene glycol capacities in China while platinum demand is forecast flat due to the lack of noticeable expansions or new launches of chemical plants producing nitric acid, silicone, and paraxylene.

**Electronics.** Consumption of palladium in electronics decreased by -2% to 0.8 MOz in 2018 on the back of the price-elastic substitution with less expensive materials, which was triggered by the palladium price rally. At the same time, broadly flat global consumer electronic sales failed to provide any support.

Producers of palladium-silver paste, which is used in MLCC, are talking about a decrease in purchases by electronic companies last year. The probable reason is that industrial consumers have decided to use previously accumulated stocks of palladium-containing products instead of buying palladium at the elevated prices. It might take a couple of months to ascertain whether the current decrease in consumption has been triggered by substitution, anticipated decrease in electronics market, or stocks' reduction.

Palladium use in contacts' production is not so price-elastic. The contacts are made not by alloying, but by plating; and the number of layers may be up to five or even higher. The selection of metals used in each layer is determined by the requirements for resistance and conductivity and one metal cannot be easily substituted with another.

According to Gartner, consumer electronics market is expected to shrink by -1% this year and, taking into account the ongoing substitution, we forecast palladium offtake in the electronic industry to decrease by -2% this year. If sustained over a longer period, palladium being at premium to gold may encourage manufacturers to switch to gold in some products, accelerating the decrease. Yet, palladium is more wear-resistant – the quality, which is valuable in contacts production, therefore we see the room for the substitution as limited. In the longer run, the widespread use of autonomous vehicles with a large number of sensors and the internet of things can lead to an increased consumption of palladium by the electronics industry.

Platinum offtake in the electronics grew exceptionally well in 2018 (+19% to 0.27 MOz) on the back of the rising demand for hard disk drives. This year, we forecast platinum demand in the electronics to stay at the elevated levels, although the growth rates are going to be lower (+3%).

**Jewellery.** Palladium is used in jewellery in white gold alloys, as well as in pure form - for example, in wedding bands. The use of palladium by the jewellery industry continued to decline in 2018 (-3% to 0.23 MOz), which was primarily due to the decline in demand for jewellery in China amid a general slowdown in consumption.

In the face of insufficient marketing support, palladium was often perceived as a cheaper alternative to platinum, especially for men's wedding bands. In the current conditions when palladium is traded at a premium to platinum (on average, 17% in 2018), this demand segment is under pressure. As a proxy, according to the London Assaying Chamber, 62 thousand palladium items (with palladium content of 50% and higher) were hallmarked in 2018, which is 26% lower than the previous year's result. The demand for palladium in the production of white gold is not so elastic to the price and is maintained at a stable level.

As for 2019, the palladium use in jewellery is likely to stay flat, although there is a risk of substitution with platinum, karat gold, silver, and alloys with non-precious metals if the positive price difference between palladium and other precious metals persists.

Jewellery is the second most important industry for the platinum consumption, which accounts for a third of the metal's offtake. Platinum use by this industry decreased (-3% to 2.37 MOz) in 2018, exacerbating the trend established over the recent years. The reason for this is, primarily, the decline in sales of jewellery in China, caused by consumers' switching to other forms of investment, and falling demand for luxury goods amid fears about the sustainability of the country's economic growth. Platinum

jewellery in this market is experiencing an increased competition from gold. However, in other major markets (India, Japan, USA, and Europe), platinum jewellery sales grew last year, partly offsetting the decline in China.

This year, platinum demand in jewellery sector is expected to stabilise. The consumption in China, the largest market, is still under pressure (cumulative platinum trading volume on the SGE in Q1 2019 were 30% down Y-o-Y), while the Indian and Western markets are counterbalancing the decline, but the global outcome still depends on the consumers' sentiment in China and how deep the decline of the Chinese market will be.

Platinum in **glass industry** performed exceptionally well last year (+27% to 0.47 MOz). The metal is used there for the production of fiberglass, optical glass, and display crystals.

In recent years, fiberglass has found new applications in construction, renewable energy (in particular, wind turbines production), as well as automotive industry, where fiberglass products are replacing some heavier metal parts of the vehicle's body. All this has prompted the launch of some new fiberglass capacities, primarily in China.

Platinum, together with rhodium, is also used in glass-melting devices, which are employed in the production of liquid crystals for the electronic devices' screen displays. A significant growth of the consumer electronics market has led to the launch of new screen displays' capacities in Asia in recent years. It is expected that the growing premium of rhodium over platinum may force the manufacturers of glass-melting machines to substitute rhodium with platinum, stimulating demand for the latter.

Platinum demand is also growing in the spark plugs' and sensors' production, which is caused by iridium substitution with platinum as a result of the price-elastic substitution.

## GLOBAL PGM SUPPLY

In 2018, primary refined palladium and platinum output contracted by -2% Y-o-Y for both metals to 6.85 and 6.15 MOz respectively. This year, primary refined palladium and platinum production is likely to recover by +4% each to 7.13 and 6.4 MOz.

### RUSSIA

In 2018, the Russian Federation, the world's largest producer of palladium, recorded a slight decrease in the refined metal output (-2% Y-o-Y to 2.67 MOz) due to the termination of the third-party raw materials' processing by Norilsk Nickel while the metal production from its own feed remained flat.

The Russia's platinum production contracted owing to the same reason (-7% to 0.68 MOz), with the additional decline resulting from the falling production at the alluvial deposits in the Far East region. According to the reports of Russian Platinum, the country's second largest primary platinum producer, it recorded as large as a 80% decline in the last year's production volumes. Reportedly, platinum production at their main project (Kondyor mine in Khabarovsk region) has been unprofitable for some time and because of that the company is not planning any production growth there.

This year, palladium production in Russia is expected to increase by +3% as a result of operating efficiency gains at the existing Nornickel's sites. At the same time, platinum production is expected to remain flat, as the higher output by Nornickel will be offset by a production decline at other Russian platinum producers.

In November 2018 during its annual strategy update, Nornickel indicated some growth opportunities in its updated medium and long-term outlook for the PGM production based on the development of the resources of the Talnakh deposit and subject to the approval of the South Cluster project. These PGM production growth plans should meet the rising industrial demand for the PGMs in general and palladium in particular. The company has recently made the final investment decisions regarding the expansion of the Talnakh Concentrator as well as the development of the South Cluster mining project.

The Talnakh Concentrator has been approved for expansion (Talnakh Phase-3 project), which targets an increase of the throughput capacity to 18 million tonnes per annum from the current 10 million tonnes and a rollout of a new and more efficient enrichment technology. Upon the project completion, all of the ore mined at the Talnakh deposit will be processed at the Talnakh

concentrator, which should yield economies of scale and improve overall recovery rates in the concentration process. The project is planned for commissioning in 2023. Upon Talnakh Phase-3 completion, the Talnakh Concentrator should become the world's largest concentrator for nickel sulphide ores. Having all of the Talnakh ores treated at a single concentrator will free up the capacity at the Norilsk concentrator to treat the feed coming from the South Cluster project.

The South Cluster is the mining project developing the Northern part of the Norilsk-1 deposit – the very same ore body that gave birth to Norilsk Nickel back in 1930s. The project will give this heavily depleted deposit a new life. The total mineable resources of disseminated ore at the South Cluster amount to 165 million tonnes. The ore mining capacity is scheduled to reach 9 million tonnes per annum by 2027. Since Norinickel has all the infrastructure in place, the stripping works are scheduled to be launched in 2019, while the mine ramp-up is expected to start in 2021-2022. At the first phase of the project, the existing open pit mine will be expanded while the underground mine revamp is scheduled for the second phase. The Company is expecting an additional annual production of over 20 tonnes of PGMs as well as some nickel and copper as by-products.

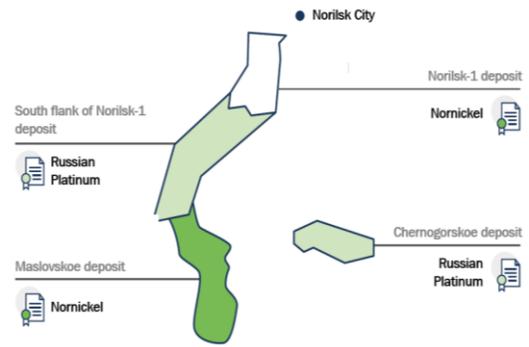
The Company also plans the development of a number of brownfield projects at the Talnakh deposit, which, combined, should increase the ore output from this deposit to 19 million tonnes per annum by 2025 from 15.7 million tonnes in 2017. The mine expansion is planned at several existing mines (Oktyabrsky, Komsomolsky, Skalistaya as well as other smaller mines), with all of the mined ore to be treated at the Talnakh concentrator. The final decision regarding the development of Talnakh brownfields is yet to be made, with a pre-feasibility study being scheduled for completion in 2019.

The South Cluster and Talnakh brownfields expansion is expected to add over 25% to the Company's PGM production volumes by 2025, compared to 2017.

Arctic Palladium, a 50/50 joint venture between the Company and Russian Platinum formed last year, is another major PGM project, which is under investment consideration. Norinickel is contributing its Maslovskoe deposit license while Russian Platinum brings its licenses for the South flank of Norilsk-1 and Chernogorskoe deposits to the JV. Arctic Palladium aims at becoming one of the world's largest PGM producers targeting the annual production volume of approximately 70-100 tons of PGMs. The project's investment approval is to be made after the completion of a scoping study by the end of 2019.

Subject to the investment approval, the first metal from the ore recovered during the pre-stripping works and mine development is expected to be produced in 2021-2024. However, the volumes of the PGM production at Arctic Palladium will require a construction of a new concentrator, a new smelter as well as supporting infrastructure. Hence, the large-scale PGM production at the project is expected to start in 2025 at the earliest.

**Russian temporary ban on precious metals scrap and semis export** was one of the triggers of the palladium price rally's acceleration in March. However, in our view, this measure does not bear any risk of supply disruption as PGM scrappage volumes in Russia are less than 2% of global recycling and do not cover the metal mined by Norinickel. The most recent information from the Russian Ministry of Trade signals that the ban would not affect semis as it might severely hurt the gold miners struggling to process their refractory ore inside the country.



Source: Company data

## SOUTH AFRICA

Refined palladium and platinum production in South Africa decreased by -5% and -1% respectively last year to 2.48 and 4.46 MOz primarily due to the technical difficulties in the ore processing.

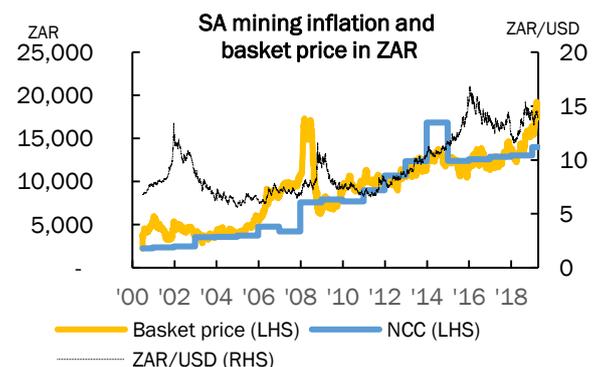
The most significant contributor to the production decline is weaker refined production by Anglo American Platinum. While the company has significantly expanded the PGMs mine output from its own sites and joint ventures as well as increased purchases of raw materials from third parties, it could not process these volume of ore and concentrate because of the repair works at its two smelters.

As a result of restructuring and closures of unprofitable mines, Lonmin has also moderately reduced production while Impala Platinum, despite some technical issues in smelting, has increased its metal output last year. Northam Platinum has also significantly increased production as a result of the accumulated ore and concentrate processing at the brand new smelter opened last year.

This year, palladium and platinum production in South Africa is expected to increase by +8% and +6% respectively as the accumulated work-in-progress material will be processed and sold. The macroeconomic environment also supports the production growth – a weaker rand and higher credits from minor PGMs inflate the PGM basket price in the local currency making even the worst performing projects, which has been previously set for closure, profitable.

Amplats is expecting a lower refined metal output this year as a result of the termination of the offtake agreement with Sibanye-Stillwater on Rustenburg feed, but this decline is expected to be offset by the growing own production and feed purchases.

Impala Platinum is going to start Lease Area reconfiguration not earlier than in FY2021 sustaining or even increasing production at all sites. Northam Platinum



Source: Company data, Reuters, SFA (Oxford)

is also implementing the strategy of production growth by developing its Booyendal project.

The only loss in comparison with our previous report is Wesizwe's Bakubung - a greenfield project, which was planned to be launched this year but then delayed until 2021 primarily due to the lack of financing. The company has decided to reduce its capital expenditure and decrease the project's capacity from 3 to 1 million tonnes of ore per annum. Now, it is expected to produce between 100-200 koz PGMs in 2022-2026.

The major risk, which might affect the PGM production in South Africa this year, is wage negotiations with the trade unions. Current three-year wage agreement expires 1<sup>st</sup> July, and negotiations may last for months and cause labour unrest and strikes. However, the recent Sibanye-ACMU deal to end strikes at the gold mines without any enhanced remuneration suggests that mining companies have strong negotiation position. The company will make only a payment of 4000 rands (less than USD 300) to each employee - the result that cannot be considered as AMCU's victory, because, in accordance with the law, the employees have not been paid for the 5 months of strike action.

Another issue is Eskom's decision to raise the electricity tariff by 13.8% this year, which leads to a noticeable increase in mining cash costs. In their comment, the Minerals Council of South Africa said that the decision posed a significant threat to employment and production - 90,000 gold and platinum jobs are now at risk as a result of the increase.

Talking about more distant future, Amplats has announced that the company would benefit from the Mogalakwena concentrator expansion, especially given the sustained palladium market deficit. At this stage, Amplats is considering a 9 - 12 million tonnes per annum concentrator, which would lead to additional 270 koz palladium and 250 koz platinum annually as the mine has the sufficient smelting and base metal refining capacity in place for such an expansion. The company conducts a prefeasibility study, which is expected to be finalized this year while the full study could take another year to complete. Project execution will take about two years. At the same time, the company has already revised the long-term Mogalakwena mining plan (by 2035), focusing on increasing mined ore tonnage and sustaining 500-550 koz platinum per annum. Additionally, the company has consolidated the Mototolo/Der Brochen operation - potentially one of the biggest projects in South Africa, but there has been no announcement yet regarding the plans for the future development.

Nevertheless, Anglo American CEO Mark Cutifani said recently that high palladium prices would not drive the company to increase its production, as they are very cautious about overproducing. He also noted that the world did not need a lot more of PGMs - this suggests that the company has not formed solid expansion plans yet.

## ZIMBABWE

In Zimbabwe, metal output was flat last year. A slight decrease was observed at the Zimplats and Mimosa projects where production returned to the 2016 levels while a moderate increase was seen at the Unki project.

In the mid-term, production in this country will not undergo any significant changes as the existing players are not willing to expand their projects while the newcomers (like Darwendale, Karo) are struggling with fund raising - a difficult task until the political climate improves. However, it seems that the government is

breaking the ice for some changes. Last month, the authorities announced that they would scrap the indigenisation law, under which the foreign companies' ownership of Zimbabwean operations was restricted to 49% only. There also are some plans to review the mining taxes to make them more competitive.

## NORTH AMERICA

Production of primary refined palladium in Canada increased by +8% Y-o-Y in 2018, predominantly as a result of an increased output by North American Palladium. Glencore Sudbury also expanded production due to increased processing of third-party materials, while their own production declined. The depletion of the resource base in Vale's Sudbury project explains the decline in the metal production last year. Platinum production slumped by 10% as a result of the weakening Vale's and Glencore's production.

Palladium and platinum output in the United States increased by 6% and 5% respectively last year following of the launch of the Sibanye-Stillwater's Blitz project.

In 2019, North American PGM production is going to expand further backed by the Blitz mine ramp up as well as the NAP's Lac des Iles expansion.

## RECYCLING

The long-term growth of palladium recycling from the automotive catalysts is driven by higher metal loadings in vehicles as well as growing vehicles production. The greatest growth is expected in China where the catalyst recycling market is still underdeveloped but is forecast to overtake the Japanese and European markets by 2030.

Currently, we see that Euro 4 and Tier 2 vehicles with higher loadings are coming into the scrapyards and the high steel scrap prices as well as the increased PGM basket price are incentivising the recyclers to increase collection.

In 2018, the production of recycled palladium increased by +11% while platinum scrappage grew by +7%. This strong recycling growth has led to backlogs in smelting and refining, which is quite painful for the recyclers in the high palladium leasing rates environment.

Platinum recycling falls behind palladium for several reasons. First of all, mid-1990s was a period when many OEMs moved from platinum to palladium in TWC; as a result, additional recycling volumes coming from the diesel vehicles with higher loadings can offset this decline only partially. In a more significant way, platinum recycling is also affected by the difficulties with the silicon carbide processing from diesel particulate filters (DPF) that require smelting in electric arc furnaces at higher temperatures.

This year, palladium and platinum recycling is expected to grow at a slower pace (+2% and +4% respectively Y-o-Y) as a result of the high 2018 base and the lack of spare smelting and refining capacities, which is currently seen in the industry.

## MARKET BALANCE

In the *palladium* market, we expect another year of deficit but lower than our previous report has suggested, following worse than expected automotive production (- 0.3 MOz), and an increase in production, both primary (+0.2 MOz) and secondary (+0.1 MOz).

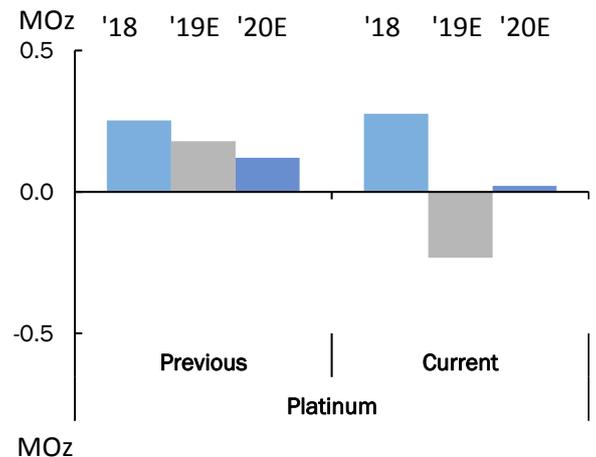
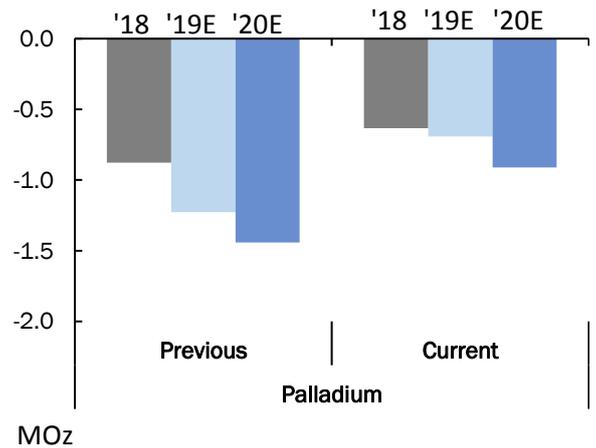
A weaker rand, which depreciated by more than a quarter in February-December 2018, eases the pressure on the South African miners - their basket price has reached the highest level in rand terms since 2008, making most projects in the country profitable and incentivising miners

to ramp up their production. Bottlenecks in processing prevented miners from increasing the refined production in 2018, but these volumes are going to reach the market this year. Recycling forecast has also been revised up on the back of the higher collection rates.

Next year, the deficit is going to become even larger on the back of the emissions' legislation tightening that pushes consumption up at a faster pace than the incremental increases in production.

Supply from the ETFs' release fell significantly in the Q1 2019 (-33 koz YTD) indicating that all professional investors who wanted to switch to the backwardation-exposed investment instruments had already done so. Because of that, the Global Palladium Fund (GPF) becomes more important in filling the gap between consumption and production. In 2017-2018, GPF delivered more than 1 MOz of palladium in excess of the Company's current production and the Fund is aiming to continue its operation to bridge the deficit in the mid-term.

If the current sentiment persists, the **platinum** market could be expected to be close to balance this year. A significant increase in ETF holdings is the key reason behind our decision to review the platinum balance forecast this year. Although the platinum production is expected to grow faster than consumption, the excess amount of metal can still be absorbed by the investment demand. For the next year, our forecast of a minor surplus remains, however if the investor demand remains strong, we might see a well-balanced market or even a deficit.



*Platinum balance includes investment and movement of stocks*

Source: Company data

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7 May 2019

# Macro Drivers and Financial Flows

**Global**

Commodities | Strategy

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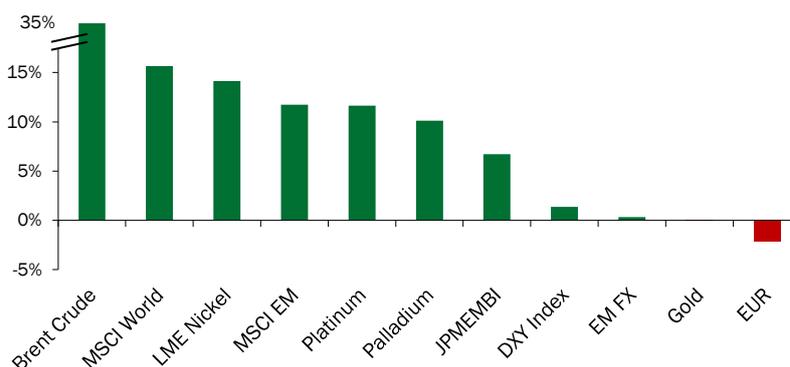
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## Macro drivers and financial flows

### 2019 off to a strong start

After the trials and tribulations of Q4, the first few months of 2019 have provided a rather more benign backdrop for global asset prices. Underpinned by a dovish about turn from the FOMC, rising hopes of a US-China trade deal and increasing evidence that China's growth slowdown is bottoming out, risk assets enjoyed a strong first four months of the year.

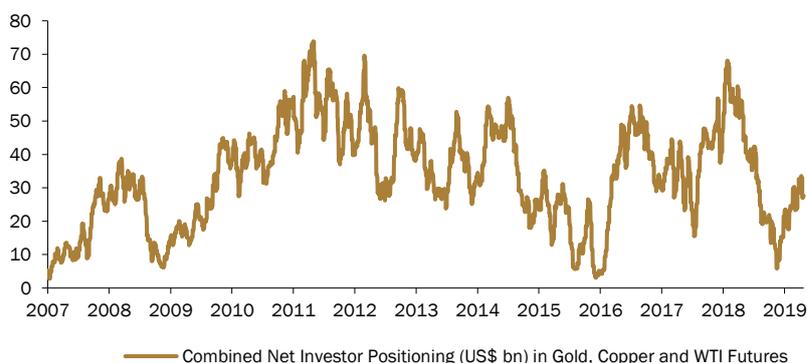
#### Year-to-May performance – risk asset recovery



Source: ICE, MSCI, LME, LPPM, JPM, LBMA, Bloomberg, ICBC Standard

Indeed, industrial metals have rallied almost across the board, with investors exhibiting tentative signs of regaining their appetite for commodities after the washout of positioning that occurred in 2018. That said, year-to-date metrics are clearly flattered by their low starting point and, for aggregate measures of commodities, by the performance of crude oil following the commitment of OPEC+ to limit production and the US decision to end sanctions waivers on Iranian exports. The key question therefore, is whether or not this relief rally will prove to be a “dead cat bounce” or the beginning of a sustained bull market?

#### Investors' commodity positioning has bounced back but far from fully recovered



Source: CME, CFTC, Bloomberg, ICBC Standard

Clearly, there remain a multitude of potential macro pitfalls for markets and investor confidence is understandably fragile. Nevertheless, in this report, we will lay out why, after a period of consolidation, we think a continued rally is more likely, at least through the end of 2019.

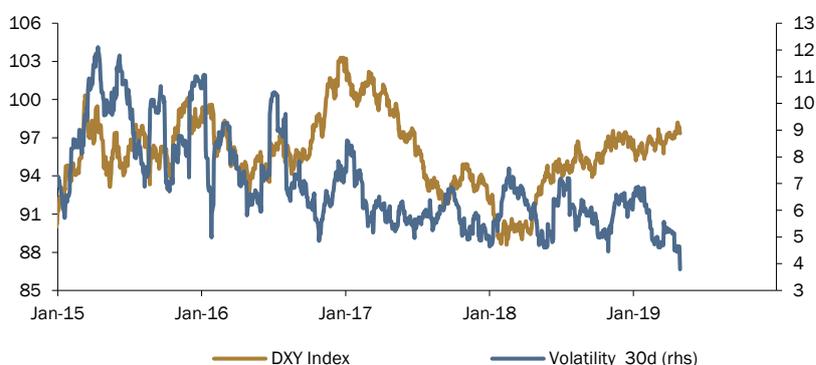
In short, the core reasons for this view can be summarised as:

- 1 A stable US dollar
- 2 Persistently low inflation allowing major central banks to defer policy tightening
- 3 US growth slowing but far from collapsing
- 4 China’s authorities deploying meaningful support for the economy

**FX markets – steady as she goes**

Through 2018, the US dollar’s broad-based rally presented a material headwind to dollar denominated assets, such as commodities. Year-to-date in 2019, however, it has essentially gone sideways, rising 1.4% in exceptionally un-volatile fashion.

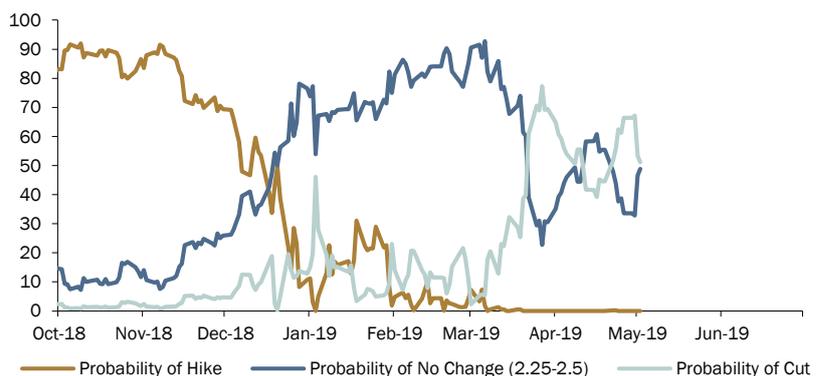
**Dollar rally stalls and volatility collapses**



Source: Bloomberg, ICBC Standard

In some respects, even this steady performance is surprisingly strong. Considering the market’s re-pricing of expectations for further interest rate hikes – shifting from c.90% chance of a hike in October to 50:50 between no change and a cut – there is an argument that the dollar should actually have weakened.

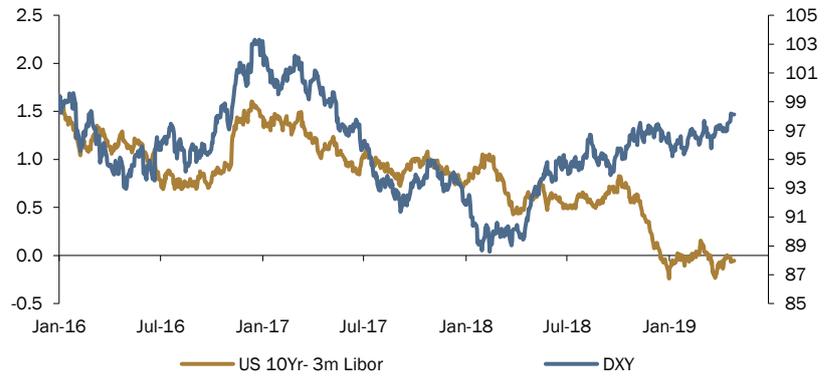
**Likelihood of an FOMC policy change by December 2019**



Source: CME, FOMC, Bloomberg, ICBC Standard

Furthermore, the yield curve has continued to flatten, with the spread between three month Libor and ten year Treasuries even turning negative. All else equal this should weigh on the dollar, as it implies a market pricing of heightened recession risk, albeit with the caveat that quantitative easing may have distorted the value of the yield curve shape as a potential harbinger of future recessions.

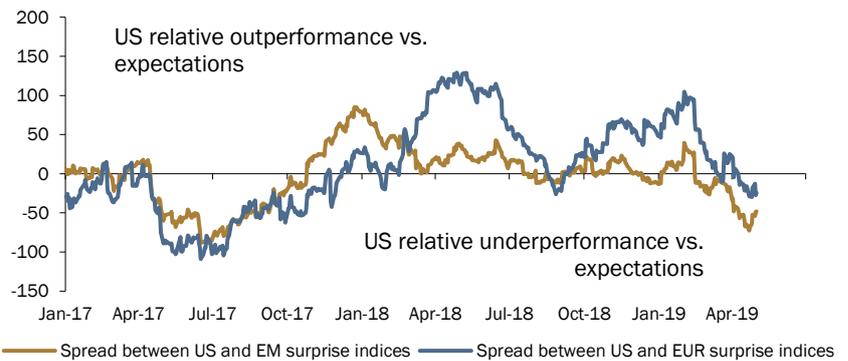
**The US yield curve has inverted between 3mth Libor and 10yr Treasuries**



Source: ICE, Bloomberg, ICBC Standard

In terms of growth, the US has also swung from being the only major region performing in-line with or above expectations through much of 2018, to slipping below expectations and, on a relative basis, below other major regions in 2019.

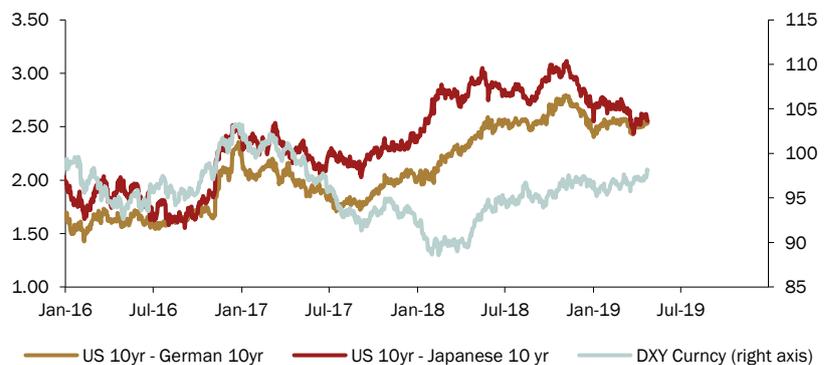
**US growth outperformance stalling in 2019**



Source: Citi, Bloomberg, ICBC Standard

There have, however, been significant offsets to this, which, in our view, have kept the dollar steady. In absolute terms, it is still the fastest growing advanced economy, forecast by the IMF to expand by 2.3% in 2019, compared to a Euro Area figure of 1.3% and perennially anaemic 1% for Japan. Moreover, the yield differential for US 10yr Treasuries over their German or Japanese equivalent remains in excess of 2.5%.

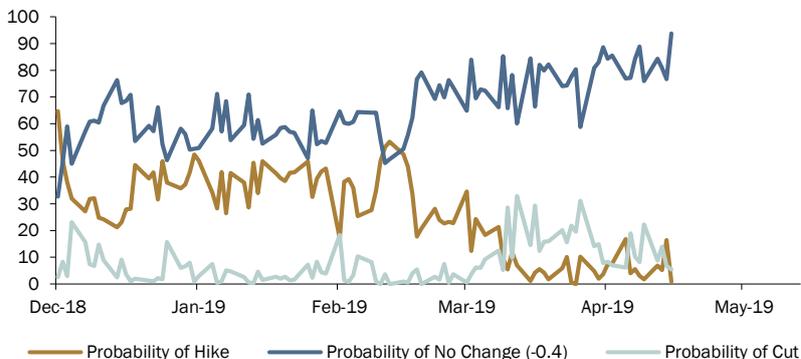
**Treasury yields outstrip Japanese and European counterparts**



Source: Bloomberg, ICBC Standard

These factors evidently add to the dollar’s investor appeal, coupled to which is the fact that the FOMC has been far from isolated in shifting to a more dovish policy position. In the wake of disappointing Eurozone growth and the ECB’s March announcement that it will keep rates on hold until at least the end of this year, markets have also repriced the outlook for hikes in the single currency area.

**Eurozone deposit rate expected to hold in negative territory through end 2019**



Source: ECB, Bloomberg, ICBC Standard

Regarding the remainder of 2019, we expect this balancing act to continue and for the dollar to remain relatively stable on a basket basis. In support of this, we think that current investor positioning creates two antagonistic forces that will serve to keep the dollar within its recent range.

Running counter to the dollar is the fact that investors already appear to hold substantial length in the currency, creating the risk of a positioning exacerbated correction if, for example, Euro Area growth improves or the US stumbles.

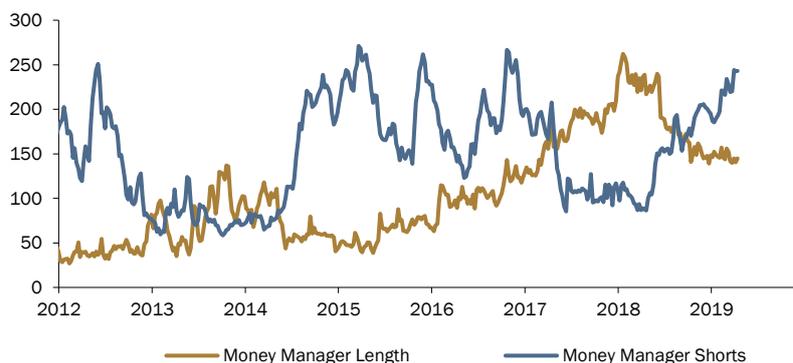
**Investors have continued to reduce net length in EUR**



Source: CME, CFTC, Bloomberg, ICBC Standard

Specifically, looking at investors’ current FX positions on the CFTC commitment of traders (COTR), it highlights that net length in the EURUSD has continued to fall in 2019. Although the overall position is materially less short than it was in 2014-2017, the absolute active short is approaching historic range highs. This by no means guarantees a reversal but does create the potential for a short covering rally in the Euro.

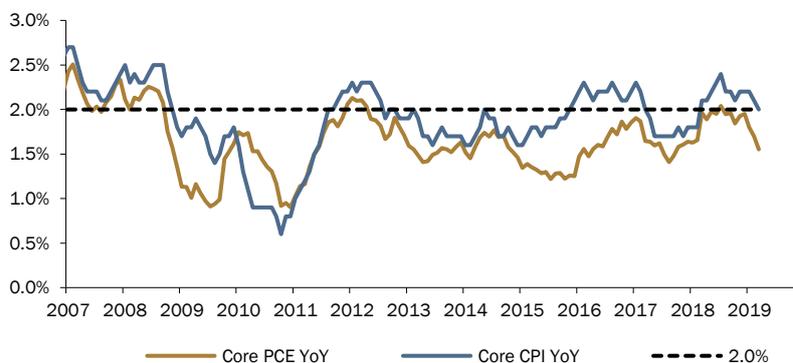
### Driven primarily by a build of active short positions



Source: CME, CFTC, Bloomberg, ICBC Standard

On the other hand, as can be observed in the reaction to May’s FOMC decision, the rates market may have over-priced the potential for cuts later this year – indeed, as argued below, we believe it has. In the short-term, this stems from the committee’s willingness to look through the recent softening of core inflation but essentially it comes down to how much longer the current US expansion can sustain for. Unless this appears to be in serious jeopardy, we think rate hikes will be off the table and that the dollar will continue to find support from interest rate differentials.

### Core inflation retreating below 2%



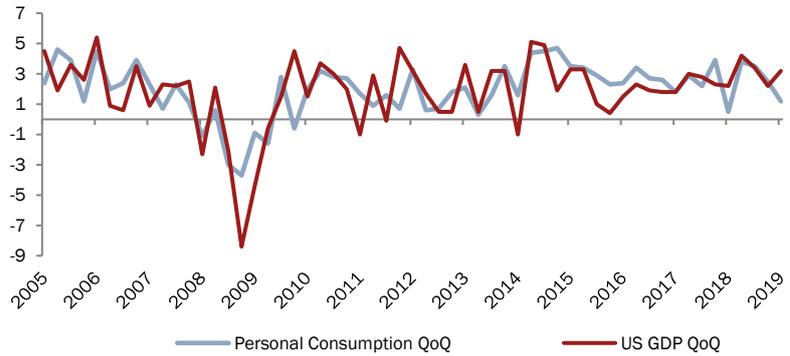
Source: US BEA, Bloomberg, ICBC Standard

### US domestic demand stutters but a collapse looks unlikely

Turning to US growth, despite Q1’s headline figure of 3.2% q/q comfortably exceeding consensus expectations of 2.3% q/q, the underlying details of the release did little to allay fears that a growth slowdown is underway. Most prominently, personal consumption growth slipped to 1.2% q/q, flagging that Q1 was a period of relatively soft demand growth.

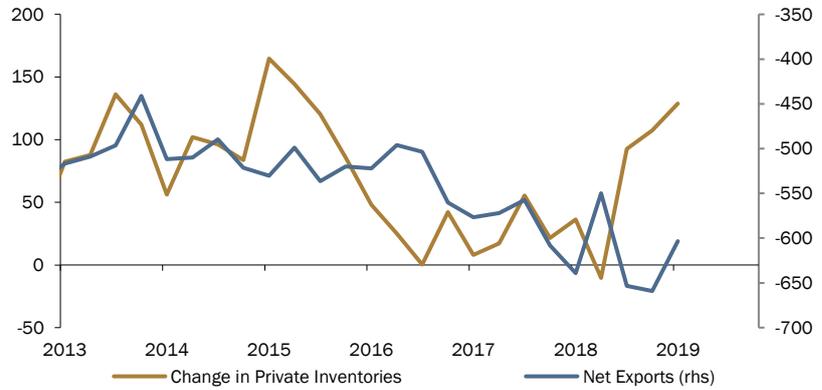
This point was further reinforced by the fact that Q1’s growth acceleration was largely accounted for by a jump in net exports – due to a fall in imports – and a \$129bn build in private inventories; both suggesting that domestic demand was tepid at best.

**GDP headline beat masks a slowdown in demand growth**



Source: US BEA, Bloomberg, ICBC Standard

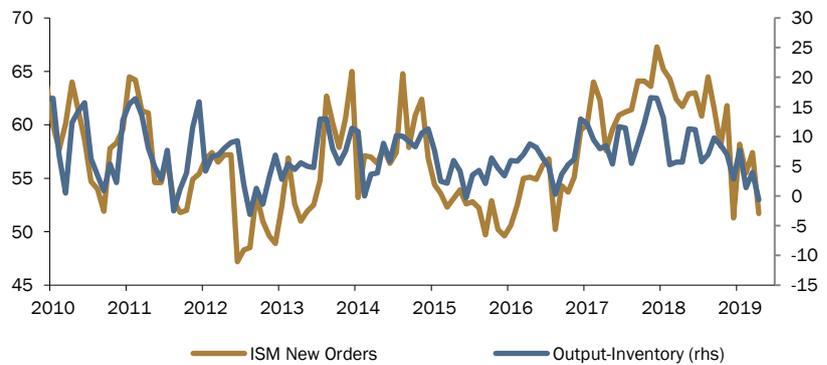
**GDP flattered by net exports and inventory builds**



Source: US BEA, Bloomberg, ICBC Standard

Coupling this with the recent fall in the ISM survey – where both the New Orders sub-index and spread between the Output and Inventory sub-indices declined – underlines that output has likely been running ahead of demand and is therefore likely to slow in the coming months, as inventory builds are digested.

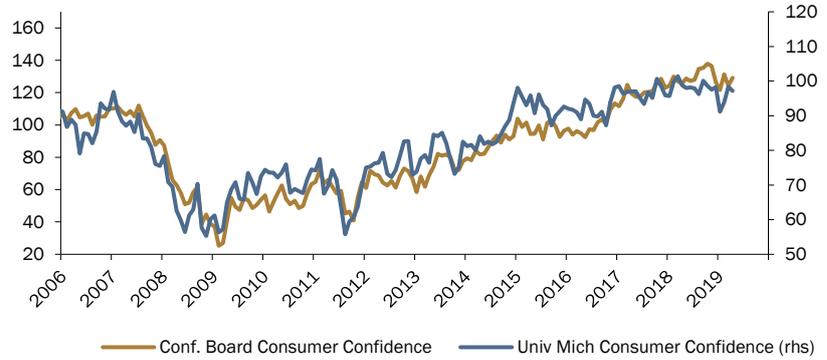
**ISM readings point to a slowdown in output**



Source: ISM, Bloomberg, ICBC Standard

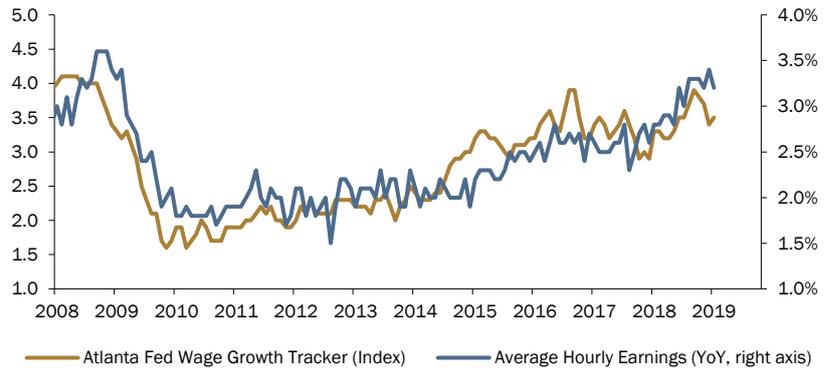
All this said, we view Q1's stutter as just that, rather than the beginning of a more substantial and sustained slowdown. Consumer confidence remains elevated, with unemployment at just 3.8% and wages growing steadily. Productivity growth has also accelerated in recent months, rising by 3.6% q/q in Q1, supporting the potential for continued wage growth.

**Consumer confidence holding around cycle highs**



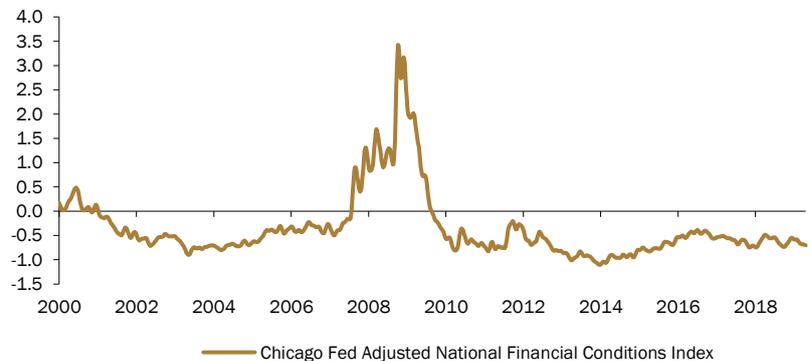
Source: Conference Board, University of Michigan, Bloomberg, ICBC Standard

**With wages expanding at a steady clip**



Source: Atlanta Fed, US BLS, Bloomberg, ICBC Standard

**And financial conditions still loose**



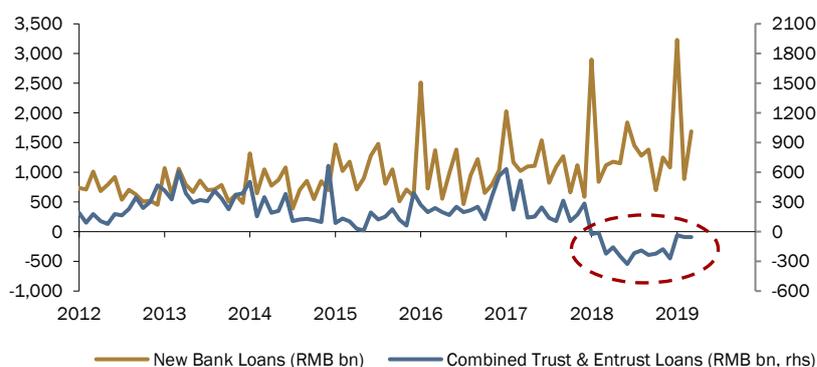
Source: Chicago Fed, Bloomberg, ICBC Standard

With the FOMC having pressed pause on further hikes, financial conditions also remain relatively loose and we do not therefore see the current US expansion being derailed just yet. Were inflation to surprise on the upside – forcing the Fed into another round of tightening – or US-China trade negotiations to end acrimoniously, denting consumer confidence in the process, things could of course change but our current base case is for growth to hold up in 2019, especially as distortions such as the US government shutdown fade into the rear-view mirror.

### China – stimulus but not as we know it

For China also, we maintain a relatively sanguine view. This is not because we expect a re-run of the post 2008 or 2015 stimulus playbooks – the structural drive to reduce financial sector risk remains – but rather because we think there has already been a material net shift in policy from what were contractionary conditions through much of 2018. Specifically because non-bank lending, while not surging, is no longer contracting at the pace it was during much of 2018. Coupling this to steady growth in bank lending and corporate bond issuance is allowing for a material increase in the overall pace of credit growth.

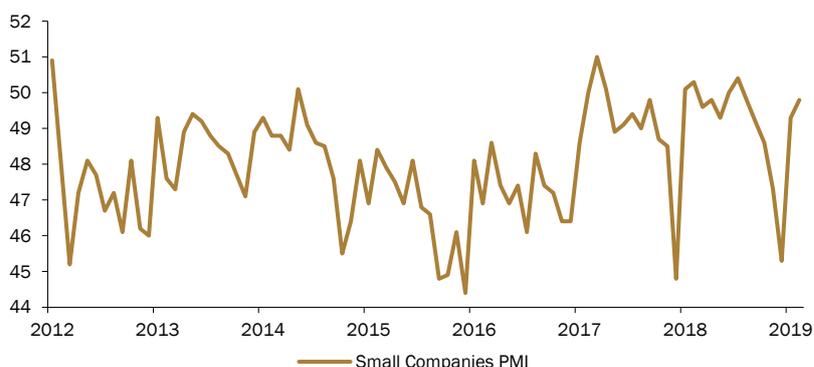
#### Non-bank lending – taking a pause from deleveraging



Source: PBoC, Bloomberg, ICBC Standard

Small and medium sized private companies, who have historically been most dependent on non-bank forms of financing, struggled under the weight of tighter credit conditions in H2 2018. However, in-line with the reduced pressure on deleveraging noted above, they appear to be enjoying improved conditions in recent months, as reflected in both the stronger Caixin PMI and official PMI sub-index for small companies.

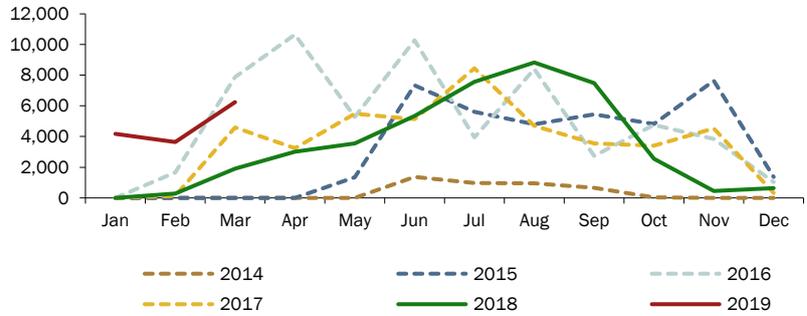
#### Conditions for small companies turning the corner



Source: China NBS, Bloomberg, ICBC Standard

Furthermore, local government bond issuance was notably strong in Q1, up 227% y/y from 2018's tepid level of issuance. This is unlikely to sustain and we expect front loading to mean growth is given back in H2 but is still supportive of upcoming fixed asset investment (FAI) in infrastructure.

**LGB issuance off to strong start in 2019**



Source: PBoC, China NBS, ICBC Standard, Bloomberg

In aggregate, these measures are also delivering a pick-up in the pace of money supply growth, which should help headline activity to stabilise over the course of Q2 and Q3.

**Money supply growth showing signs of life**



Source: PBoC, China NBS, Bloomberg, ICBC Standard

Following this, construction activity appears to be bottoming out sequentially and sales have rebounded over the course of Q1, with support coming from increased mortgage lending and marginal relaxation of purchasing restrictions. This should feed through to new construction starts with a c.3-month lag and we view it as a strong indicator of improving consumer sentiment.

**Housing sales recovery to led bounce back in new starts**



Source: China NBS, Bloomberg, ICBC Standard

The auto sector is yet to benefit from these improvements, with sales contracting a further 5% y/y in March. Nevertheless, the pace of contraction appears to be slowing. For January and February combined sales fell 15% y/y and, after seasonal adjustment, look to have expanded 12% m/m in March. The distortion of lunar new year makes this difficult to interpret but the auto sector may also be approaching a turning point. Indeed, we think that looser financial conditions, combined with the recent VAT cut and more targeted fiscal easing measures will serve to underpin demand.

**Auto sales remain the laggard**

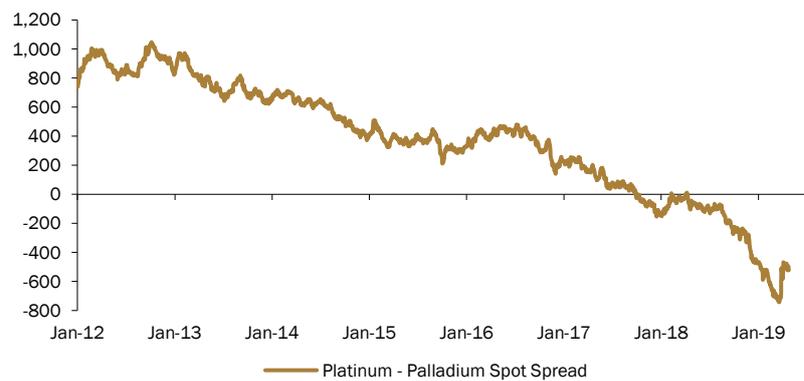


Source: China NBS, CAAM, Bloomberg, ICBC Standard

**PGM investor positioning**

After six years of relatively trending performance, the platinum – palladium spread snapped back in March, as palladium prices finally corrected from historic highs, while platinum initially maintained its tentative recent recovery.

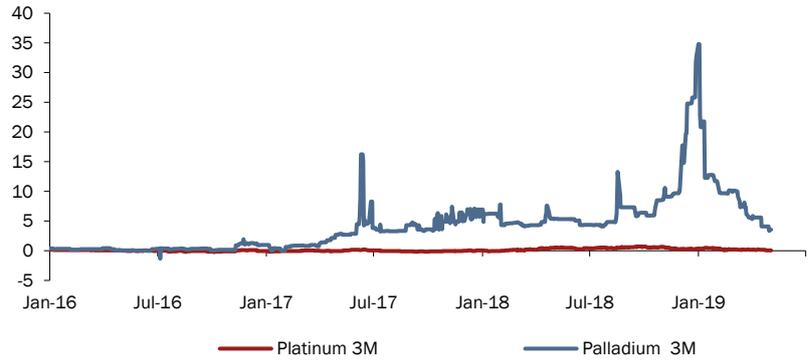
**Platinum – Palladium spread corrects from historic discount**



Source: LPPM, Bloomberg, ICBC Standard

As discussed in the main section of this report, these respective moves do not appear to be fundamentally driven but stem from shifting investor flows and forward expectations. Indeed, in terms of market reflections of fundamentals, we would highlight that that palladium lease rates, though less extreme than in Q4, remain elevated. By contrast, platinum’s subdued borrowing costs exhibit no sign of physical tightness.

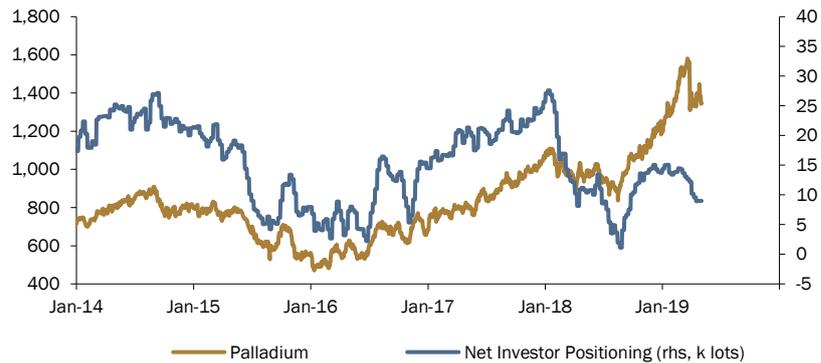
**Palladium lease rates retreat, while Platinum remains subdued**



Source: LPPM, Bloomberg, ICBC Standard

In terms of palladium’s correction, it is noteworthy that although the financial market was long, there were few indications of speculative excess. Indeed, the CFTC report showed net length equivalent to 1.5 Moz, well short of Q1 2018, when net investor positioning in futures peaked above 2.75 Moz.

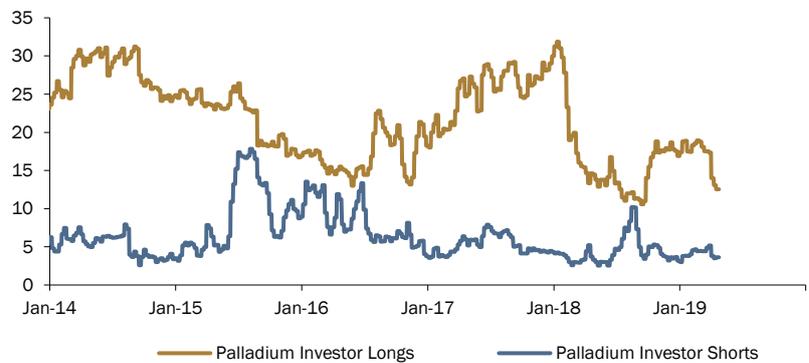
**Palladium futures positioning well shy of 2018 highs**



Source: CME, CFTC, Bloomberg, ICBC Standard

Splitting out the net position shows that the correction has seen length leave the market but no material short being built. This stands in contrast to summer 2018, when the short peaked above 1 Moz.

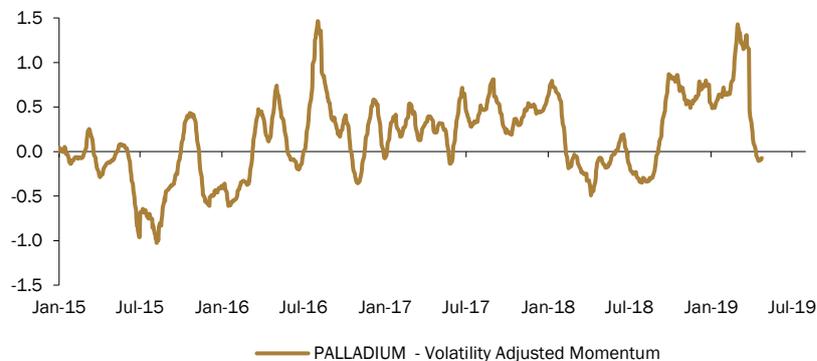
**Length heads for the exit but shorts still absent**



Source: CME, CFTC, Bloomberg, ICBC Standard

This is also in keeping with our assessment of volatility adjusted momentum, which indicates that momentum-following investors should have rapidly cut their length but not yet added any meaningful shorts.

**Momentum breaks down in dramatic fashion**

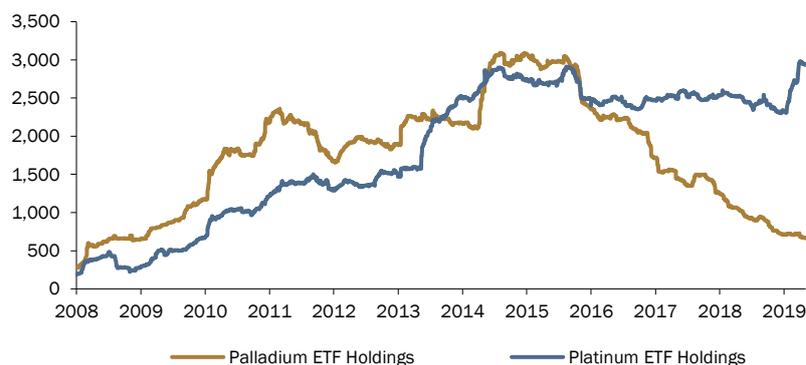


Source:

Although the proximate cause of the correction appeared to be Mark Cutifani’s comments about the market being a “bubble”, ultimately the overall market conditions had become frothy and prices were appreciating at a faster pace than even fundamental deficits could justify, especially against a backdrop of stuttering global auto sales.

ETFs have offered no offset to these flows, with investors liquidating a further 50 koz of holdings. This is a considerably slower pace of liquidation than that of a year ago, when investors cut 225 koz in the first four months of the year but ETFs remain more a source of marginal supply than demand for palladium metal. Before having confidence that the correction has concluded, we would want to see some shorts enter the market. As last summer, this marked the point that the market had become oversold, with short covering providing additional fuel for the subsequent price recovery.

**Palladium liquidation continues, while Platinum holdings surge**

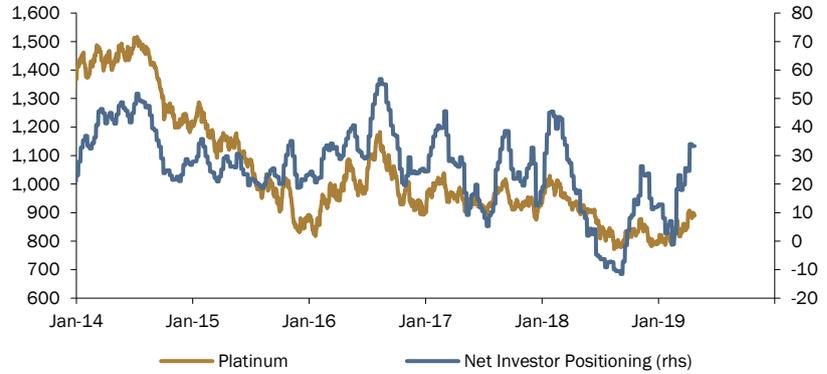


Source: Bloomberg, ICBC Standard

Switching to platinum, investor flows have been almost the polar opposite to palladium. ETF holdings have surged by 616 koz year-to-date, seemingly as value investors have sort to pick up metal at levels not dissimilar to their financial crisis lows.

In futures markets also, net investor positioning has jumped from -600koz to +1.6Moz. As per the flows in palladium, however, this change has primarily been driven by position reduction rather than new entrants.

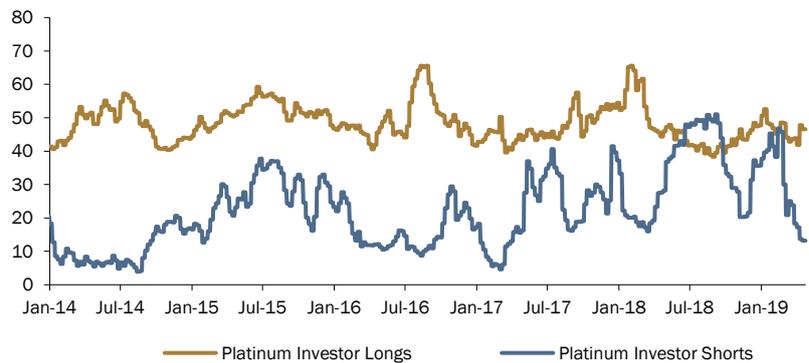
**Platinum futures positioning jumps back**



Source: CME, CFTC, ICBC Standard, Bloomberg

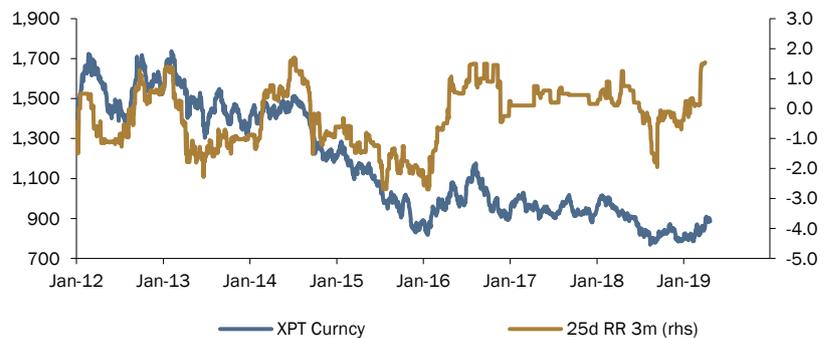
Although active length is barely changed, short positions have been cut back by a substantial 1.8 Moz.

**As investors cover their shorts**



Source: CME, CFTC, ICBC Standard, Bloomberg

In the options market as well, the difference in implied volatility between calls and puts has swung to the calls (here showing 25d out of the money options, three months forward).



Source: CME, ICBC Standard, Bloomberg

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In light of these significant ETF, futures and options positioning swings, the performance of platinum is actually rather disappointing. Given the extent of the shift in the financial market, we take the failure of the price to stage a more meaningful rally as further evidence of its ongoing physical market surplus.

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