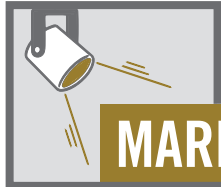


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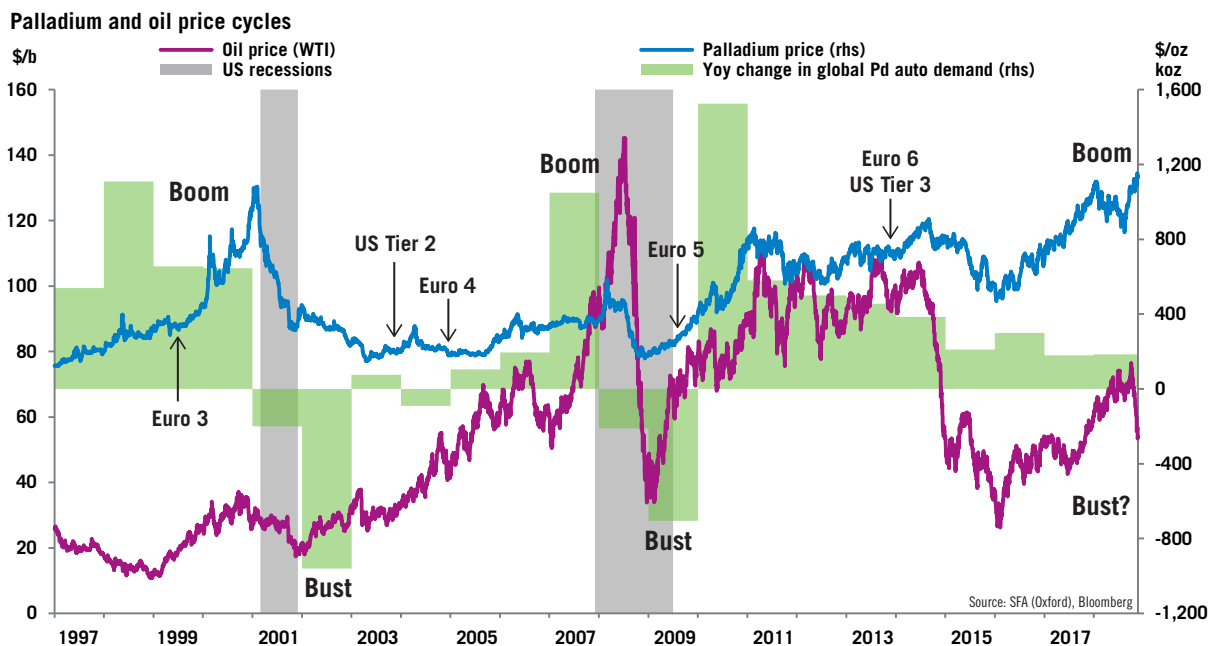
MARKET SPOTLIGHT

Will the palladium price slip up on an oil slick?

If the recent oil price decline signals slower economic growth ahead then this means lower car sales and palladium demand. The palladium spot price reached a record \$1,186/oz on 16 November, while the oil price closed at \$56/b, close to its lowest level of the year. Commodity prices are broadly driven by global economic growth, with the specific details of how far and how fast prices move dependent on the fundamentals of each market. The oil price has slumped by 28% in six weeks as the market has moved from deficit to surplus in Q3'18 (source: EIA), with supply growth outstripping demand growth.

The palladium price exceeded \$1,000/oz for the first time in 2001. A combination of booming demand from the greater use of autocatalysts in the 1990s and supply disruptions to Russian stock sales in 1999 pushed the palladium price to a peak in January 2001. The oil market was not as tight and the oil price peaked first in September 2000.

Oil climbed to a record \$147/b in July 2008. Strong demand growth had seen the oil price rocket through 2007 and this continued in 2008 even as expansion in developing countries was being offset by slowing growth in developed countries. A period of oversupply in the 2000s had kept the palladium price more subdued and it peaked in March 2008, ahead of oil.



The recent fall in the oil price could be warning of a palladium price correction. However, stock sales from Nor Nickel and ETFs have helped to fill the palladium market deficit, restraining the price. **Palladium is the tighter market, with a large deficit and high lease rates, so the price is likely to keep rising well into 2019.**



PRECIOUS METALS REVIEW

79 Au Gold

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,222	0.13%	1,230	21/11/2018	1,219	19/11/2018
€/oz	1,079	0.74%	1,079	23/11/2018	1,066	20/11/2018

Gold price could climb on reduced Fed rate rise expectations. Members of the Federal Reserve rate-setting committee have given talks widely perceived as dovish (more cautious about raising rates). Key points made were: the slowdown of economic growth in China and Europe; the fading benefits from US fiscal stimulus; and that the current rates were near the neutral rate, the level at which monetary policy is neither supportive nor restrictive of the economy. Consequently, investors have adjusted their expectations of the economy and future rate rises. Since 8 November, the likelihood of three or more rate rises between now and the end of 2019 has dropped from 67% to 35%, according to the CME FedWatch tool. The likelihood that there will be only one more rate rise in the next 13 months tripled from 8% to 24%. If interest rates rise slowly then bond yields will likely also remain subdued, reducing competition with gold. Alongside lower US economic growth, this should also weaken the dollar which would increase the gold price in dollar terms.

High gold trade volumes demonstrate the significance of speculation over supply and demand. The LBMA has begun reporting the volumes of gold traded over-the-counter (OTC) in London with the aim of increasing transparency in the global gold market. In the first week's data (week beginning 12 November) there was an average of 30.2 moz of gold traded each day with a value of \$36.9 billion. The majority (63%) of this is the physical trade of metal on the spot market but it also includes derivative contracts. To provide some perspective, China's annual gold jewellery consumption in 2017 was 22.5 moz, and metal equivalent to global gold consumption is traded every three days. Trade at the Chicago Mercantile Exchange for the reported week was larger, at 34 moz of gold per day, although this is only derivatives. The high volumes of gold traded on these exchanges, relative to the annual volumes of gold that are mined and consumed, demonstrate the limited impact that the forces of supply and demand have on the short term movements of the gold price.

47 Ag Silver

	Close	Weekly change	High	Date	Low	Date
\$/oz	14.29	-0.42%	14.56	21/11/2018	14.19	23/11/2018
€/oz	12.61	0.17%	13.70	23/11/2018	11.73	21/11/2018

Surplus market estimated for 2018. An interim update of the World Silver Survey includes a forecast of a 35 moz surplus for the silver market for 2018, an increase on the 2017 surplus of 2 moz. This is largely attributed to a 12% decline in 2018 bar and coin demand to 125 moz. However, the estimated 2018 silver demand of 963 moz is traded roughly every three days by LBMA members,

similar to gold. The average daily silver trade, as given in the new LBMA data, was 359 moz, of which 59% is spot metal trading. COMEX sees an average of approximately 500 moz traded daily but this is purely derivatives. Therefore, although a surplus market this year may have pulled the price down a little, the main cause of the price moves are investors, and silver will rise with gold.

78 Pt Platinum

	Close	Weekly change	High	Date	Low	Date
\$/oz	844	-0.13%	856	19/11/2018	837	23/11/2018
€/oz	744	0.43%	747	19/11/2018	736	20/11/2018

Trend towards high fuel efficiency could bring platinum back into gasoline cars. LMC Automotive has highlighted that strict CO2 emission targets in Europe, and soon in China, are likely to lead to gasoline engines that operate in a similar way to current diesel cars. This means they will use lean combustion which, although more efficient, has the side-effect of increasing pollutants and NOx emissions. Gasoline cars would then need additional exhaust treatment systems, such as lean NOx traps (LNTs),

which have been introduced on diesels over the last 10-15 years. An ICCT paper estimated the PGM requirement of LNTs to be 2.5 g/litre of engine size with an 80:20 split of platinum and rhodium. The amount of PGM demand will be highly dependent on the adoption rate of lean burn engines and LNTs, which compete with other non-PGM systems. However, with annual passenger car production of 13 million units in Europe and 24 million in China, the potential for additional demand could be significant.



PRECIOUS METALS REVIEW

⁴⁶ Pd **Palladium**

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,136	-3.66%	1,186	19/11/2018	1,135	23/11/2018
€/oz	1,003	-2.99%	1,038	19/11/2018	1,001	23/11/2018

Palladium prices to continue rising despite supply from stockpiles. Nornickel has issued annual PGM production guidance of 105-110 t (3.4-3.5 moz) for 2019 and 2020. Operational efficiency improvements are expected to facilitate the increase from this year's guidance of 100-105 t (3.2-3.4 moz), of which 2.6-2.7 moz is palladium. However, according to Nornickel, the palladium market deficit is expected to grow from 0.9 moz in 2018 to 1.3 moz in 2019. Through its Global Palladium Fund, Nornickel has been offsetting this deficit by liquidating existing stockpiles such as that held by the Russian central bank. In 2017-2018 the fund delivered 1 moz to industrial consumers, in addition to Nornickel's own production. Despite this extra metal, and the 1 moz of palladium supplied by ETFs since the beginning of 2017, the price reached an all-time high of \$1,187/oz just two weeks ago. The structural market deficit means high prices are likely to continue,

although Nornickel says the fund will create “a bridge over mid-term deficit”. Prices are at risk of spiking if the stockpiles run dry; ETFs currently contain only 0.8 moz of palladium.

Deficits and high prices expected in the long term. From 2025 onwards, Nornickel is targeting a 20% increase in production of 130 t (4.2 moz) from the development of its Talnakh and South Cluster projects. Nonetheless, the company is still forecasting a deficit for the 2025 palladium market of 1.2 moz. Nornickel also predicts autocatalyst demand will rise by 2.3 moz to 11.1 moz from 2018 to 2025, due to tightening emissions standards. These forecasts are on the high end of estimates, although there is agreement that the market deficit is likely to persist, meaning little relief for the palladium price barring a global economic downturn.

⁴⁵ Rh ⁴⁴ Ru ⁷⁷ Ir **Rhodium, Ruthenium, Iridium**

	Rhodium	Ruthenium	Iridium
Reporting week	\$2,575/oz	\$285/oz	\$1,480/oz
Previous week	\$2,515/oz	\$285/oz	\$1,480/oz

New ruthenium spark plug claims better performance and durability than iridium. NGK Spark Plugs, the world's leading spark plug manufacturer, has introduced a new spark plug which uses a combination of ruthenium and platinum electrodes. Ruthenium is the lowest-priced PGM and is currently more than five times cheaper than iridium. According to NGK, the new design has twice the service life of an iridium spark plug and four times that of a nickel spark plug. It also offers higher ignitability which is more suitable to modern fuel efficient engines. Currently, spark plugs account for about 6% of the iridium market, but this amount of metal would be only

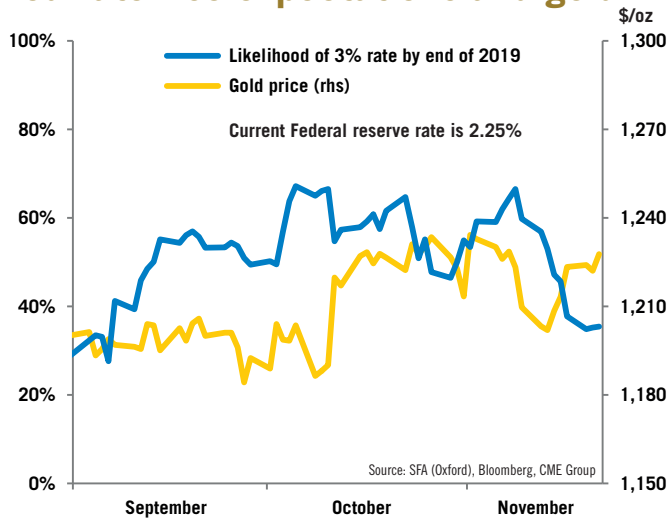
1.5% of the larger ruthenium market. Therefore, the potential substitution of iridium for ruthenium is a bigger price risk to the former than it is a boost to the latter.

The price of rhodium has increased \$60/oz to \$2,575/oz and is within \$10/oz of its previous 2018 high. Over the last two years the price has seen short, rapid rises followed by moderate pull-backs, this last one has just been larger than average. The price remains firmly in a bull market as tightness in metal supply persists. There was no change in the ruthenium and iridium prices from the previous week.

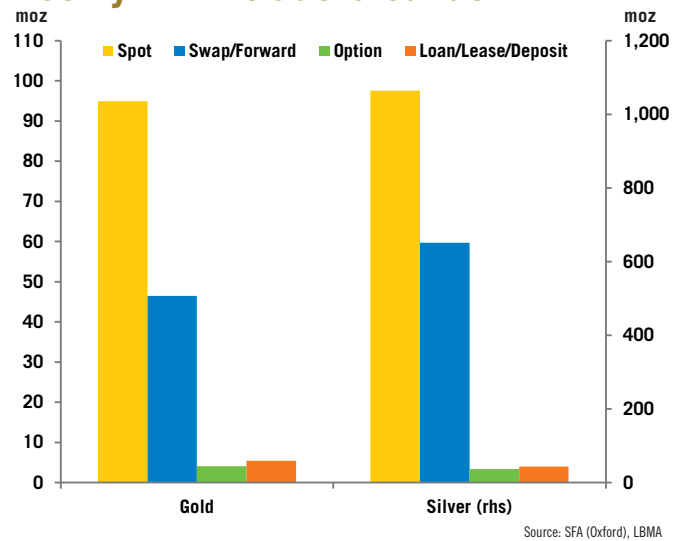


TRENDS AND INVESTMENTS

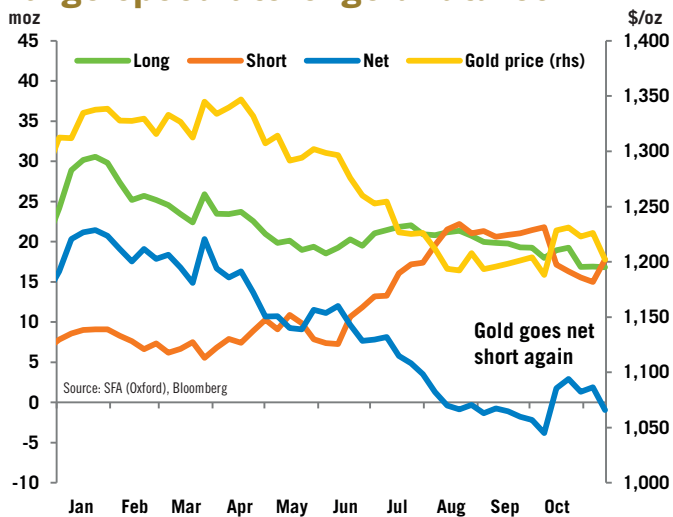
Fed rate rise expectations and gold



Weekly LBMA trade breakdown



Large speculators' gold futures



Rhodium price



Heraeus Precious Metals

Europe, Middle East, Africa & other regions
Phone: +49 6181 35 2750
edelmetallhandel@heraeus.com

South East Asia
Phone: +852 2773 1733
tradinghk@heraeus.com

www.herae.us/trading-market-report

United States of America
Phone: +1 212 752 2180
tradingny@heraeus.com

China
Phone: +86 21 3357 5658
tradingsh@heraeus.com

The HERAEUS PRECIOUS APPRAISAL produced in collaboration with:

SFA (Oxford) Ltd
United Kingdom
Phone: +44 1865 784366
www.sfa-oxford.com



The Oxford Science Park, Oxford,
United Kingdom, OX4 4GA

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