

HERAEUS PRECIOUS APPRAISAL

Heraeus

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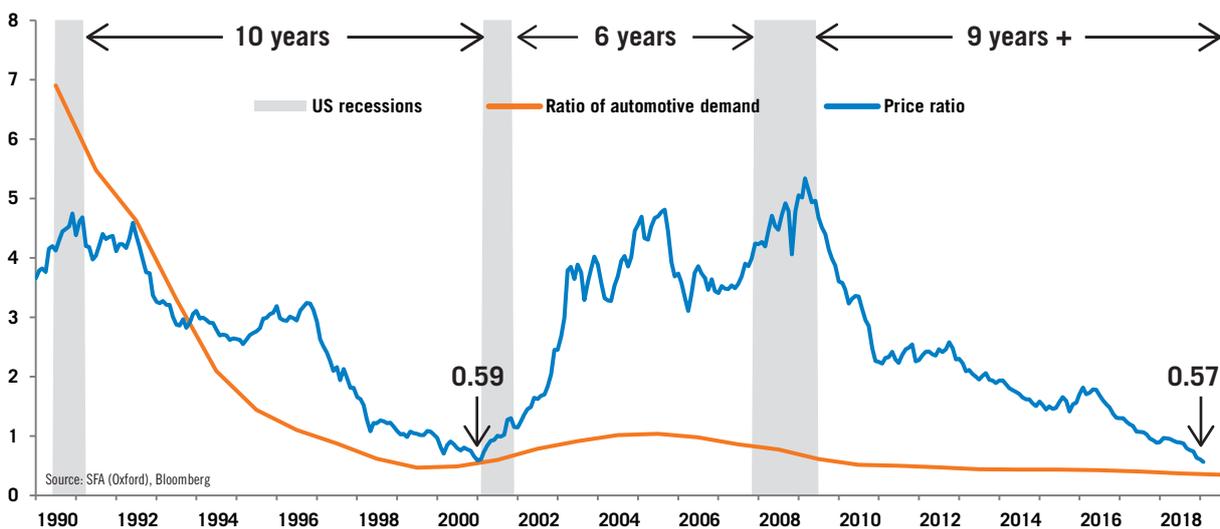
MARKET SPOTLIGHT

How much lower can the Pt:Pd ratio go?

The platinum:palladium price ratio fell to **0.57** in February, its lowest level ever. The previous low point of 0.59 was reached in January 2001, which was the month that both metals' prices peaked. There are similarities between 2000/01 and 2018/19, but also some clear differences. The similarities include economic expansions in the US nearing 10 years old, the Federal Reserve pausing in raising rates and stock prices retreating from record highs in the US and Europe.

In 2001, global palladium demand dropped and the price collapsed by 60%. This was the result of a combination of a recession in the US and the high palladium price in 2000 causing a huge drop in industrial demand. In Europe, 2000/01 saw the introduction of Euro 3 legislation which increased autocatalyst loadings. This, along with the lack of a recession and growing car sales, helped platinum demand to keep rising, but the platinum price still fell by 25% in 2001. Subsequently, automotive platinum demand rose relative to palladium as the diesel share increased in Europe, and the platinum price outperformed.

Platinum vs palladium ratios



A major difference between 2000/01 and 2018/19 is the rise in Chinese car sales which have doubled in the last 10 years. This, along with the recovery in US auto sales after the last recession, an increase in the amount of palladium being used in diesel autocatalysts and the diesel share falling in Europe, resulted in the palladium price and demand outperforming platinum. Even with a slowdown in auto sales in China, the introduction of China 6 legislation is lifting palladium usage further.

Over the next few years the platinum:palladium ratio should continue to go lower as the palladium market remains tight and automakers remain committed to the metal. This is despite the hype of an imminent switch back to platinum which, even if it did occur, would take time. Nonetheless, a temporary palladium price correction could be near, particularly if a recession in Europe is forthcoming. Europe is now a palladium-rich, gasoline-dominated market after all.



PRECIOUS METALS REVIEW

79 Au Gold

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,303	0.29%	1,311	13/03/2019	1,291	11/03/2019
€/oz	1,151	-0.37%	1,159	13/03/2019	1,144	15/03/2019

Gold ETF purchases slow in Europe despite the close Brexit deadline. European gold ETF holdings have increased 49% to 34 moz since the Brexit referendum. Purchases have slowed recently, rising by only 0.3% YTD, which is surprising as there is still no Brexit resolution with the deadline approaching. It seems investors are already positioned for the various Brexit outcomes. The gold price has been recovering as trade uncertainty remains due to the difficulty in setting up a meeting

between President Trump and Xi Jinping to potentially sign a deal. Furthermore, US inflation was muted in February and the unemployment rate remains near a record low despite a poor jobs report. This means that the Federal Reserve is more likely to hold interest rates at current levels, a positive for the gold price. Barring a sudden resolution to the US-China trade war, the gold price is expected to move back towards the \$1,345/oz peak from four weeks ago.

47 Ag Silver

	Close	Weekly change	High	Date	Low	Date
\$/oz	15.31	-0.25%	15.54	13/03/2019	15.14	14/03/2019
€/oz	13.53	-0.91%	13.75	13/03/2019	12.77	14/03/2019

European solar installations to keep silver demand level for the next 10 years. National Energy and Climate Plans from EU Member States show that many countries are aiming to increase the share of renewable energy by around 20 percentage points or more by 2030. This includes major nations such as Germany, France, Spain and Italy. Assuming a constant ratio between wind and solar, this would require 100 GW of new photovoltaic

power capacity in Europe over the period to 2030. A European Commission report on photovoltaics estimated 5.9 GW of solar power was installed in the EU in 2017. Therefore, annual installations over the coming decade in Europe should accelerate. Annual silver demand from European solar installations is unlikely to grow at the same rate due to thrifting but should remain steady at a level around 6-7 moz.

78 Pt Platinum

	Close	Weekly change	High	Date	Low	Date
\$/oz	830	1.74%	849	13/03/2019	809	11/03/2019
€/oz	734	1.06%	751	13/03/2019	720	11/03/2019

Platinum supply prospects from Zimbabwe improve as ownership rules are relaxed. A rule requiring platinum mines to be majority owned by local investors will be relaxed to allow 100% foreign ownership. Zimbabwe has the second-highest PGM resources after South Africa but the ore is more palladium-rich and relatively shallow. However, investors will still be cautious due to the country's economic difficulties and relatively uncertain political situation. If these factors improve then it is possible that new projects could be launched over the mid to long term and that existing projects will be completed in a reasonable time. Zimbabwe currently produces almost 0.5 moz of platinum and 0.4 moz of palladium per year, primarily from Zimplats. Assuming a normal investment climate, the country has the potential to produce >1 moz of platinum per year, generating substantial revenues at current spot prices.

Fiat Chrysler Automobiles (FCA) reverses pledge to eliminate diesels contingent on demand. The company had previously committed to removing diesel-powered cars from its product offering by 2022, a category which accounted for 11% of the 3.6 million cars it produced in 2018. FCA has now said it will be flexible and not cut diesels if it means sales would suffer. Many major automakers have made some level of commitment to phasing out diesels, including Toyota, PSA, Renault and Nissan. However, if diesel's market share in Europe stabilises, as it looks as if it might, then others may also maintain some flexibility in their offering to help meet strict European CO₂ targets. This could mean European platinum demand from auto manufacture (1.2 moz in 2018) could find a higher floor than is currently expected, limiting further price downside potential.



PRECIOUS METALS REVIEW

⁴⁶ Pd **Palladium**

	Close	Weekly change	High	Date	Low	Date
\$/oz	1,556	2.65%	1,563	15/03/2019	1,510	11/03/2019
€/oz	1,375	1.95%	1,381	15/03/2019	1,344	11/03/2019

China's car sales have disappointed so far this year but could pick up from April based on a reduction in Value-Added Tax which comes into effect that month. Sales of light vehicles fell for the eighth consecutive month, down 17.4% year-on-year in February to 1.22 million units. This follows declines of 15.8% and 17.7% in December and January respectively. Additionally, electric cars are maintaining strong growth and expanding market share. In the first two months of 2019, 114,000 fully electric cars were sold (+128% year-on-year), increasing the market share to 4.4% from 1.6% for the same period last year. A recovery in car sales is currently expected later this year following the tax cut in April which could encourage consumers who have been waiting for government relief. The tax cut is smaller than the previous incentives for the auto industry in 2016 and major economic stimulus is unlikely. Palladium demand is currently estimated to rise in 2019 due to higher loadings but if gasoline car sales underperform expectations by 1%, around 22 koz of palladium demand would be lost. Even with dramatic

underperformance, the palladium market would still be in deficit so the downside risk to the price is quite minimal.

VW's increased EV sales target would hit palladium demand by 0.7 moz over the next decade. The company was aiming to sell 15 million fully electric vehicles in the next 10 years but has revised up that number to 22 million. As a result, the group fleet in 2030 is now planned to be 40% electric, as opposed to 25%, and VW is now set to launch 70 new electric models by 2028, rather than 50. VW delivered 10.8 million vehicles in 2018, of which almost half were in Asia and a third were in Europe. Assuming that the extra 7 million electric cars forecast to be sold replace combustion engine cars, this translates to approximately 0.7 moz less palladium demand cumulatively over the next 10 years. However, the impact could be substantially less as actual uptake of electric vehicles will also depend on factors such as sufficient charging infrastructure and consumer demand.

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

	Rhodium	Ruthenium	Iridium
Reporting week	\$3,170/oz	\$275/oz	\$1,460/oz
Previous week	\$3,025/oz	\$275/oz	\$1,460/oz

Rhodium continues to climb as it hits \$3,170/oz after it surged \$100/oz in one day last Monday. There has been strong demand in all areas, from industrial consumers such as automakers to trading houses. There has been little price elasticity on the supply side – investors holding out and limited mine supply – so entities trying to secure metal have been purchasing on the basis of supply security rather than price. The price has now

been rising for the last nine weeks but ruthenium and iridium prices have not yet followed rhodium higher. All three metals reached lows in 2016 and have been climbing since. Further gains for ruthenium and iridium are expected this year based on their fundamentals. Ruthenium and iridium price moves tend to be short and sharp and so could accelerate later in the year.

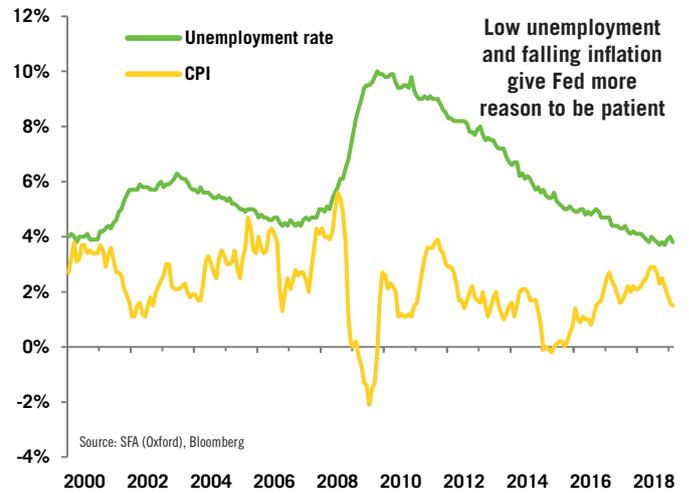


TRENDS AND INVESTMENTS

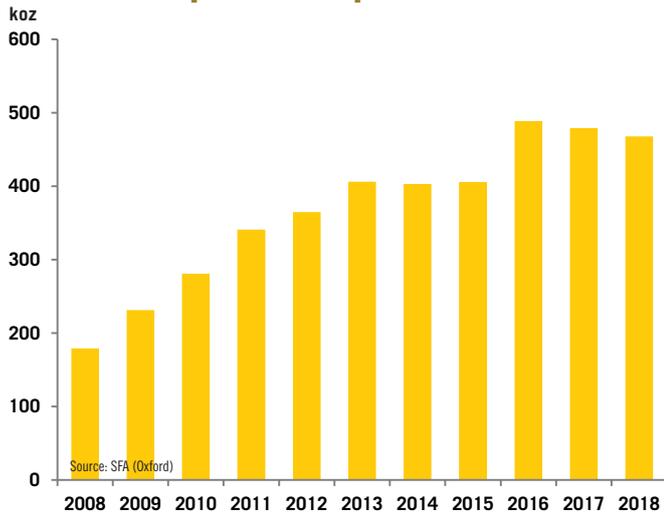
Gold ETFs



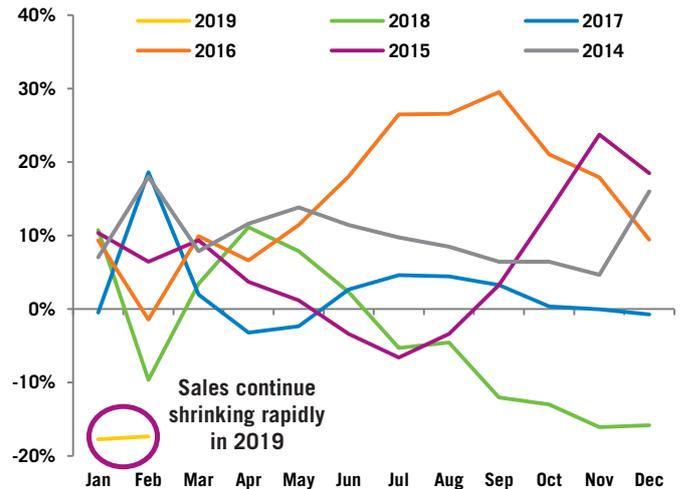
US unemployment and inflation



Zimbabwe platinum production



China car sales y-o-y performance



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