Making Smart Decisions in the Volatile Precious Metals Market

Youn-Chong Choi and Elena Weiland, Heraeus Precious Metals, Germany, discuss the precious metals market and its significant role in the fertilizer industry.

The principal method to manufacture nitric acid is the catalytic oxidation of ammonia – the so-called Ostwald process. The ammonia gas is oxidized to nitric oxide and nitrogen dioxide by air or oxygen through a multi-step procedure. In this process, a catalyst consisting of platinum-rhodium gauzes is used. Palladium gauzes are typically installed below the catalyst to minimize the precious metal losses. Nowadays, the diameter of the catalyst, matching the diameter of the burner, is in the range of 1 – 6 m. The number of required gauzes depends on the process parameters, and the weight of the catalyst system can reach up to 200 kg in the case of bigger diameters. This substantial weight of precious metals, an alloy consisting of platinum, rhodium, and palladium, is a subject of high capital investments, especially taking into account the high volatility of these components.

Volatility in precious metals prices
Concerns of industrial companies when facing rising commodity prices are not without foundation. The precious metals market is regularly marked by fluctuating price movements. It can be triggered by political, economic, and even psychological factors when investor decisions are elicited by soft facts rather than by plausible arguments. So while gold and silver typically react to macroeconomic data and monetary policies, platinum group metals are, amongst others, particularly exposed to developments in specific industries and thus economically driven news. It is, however, often observable that correlations exist among the precious metals prices. Thus, precious metals often intertwine on the
price charts while being concertedly exposed to geopolitical happenings in the world. Gold and silver, for example, react to US dollar movements, decisions by the Federal Reserve on interest rates, as well as political tensions in the world. Platinum, palladium and rhodium, for instance, are mainly influenced by developments in the global automobile industry, which represents over 40% of total platinum demand and over 80% of total palladium and rhodium demand.1

**Applying smart solutions by mitigating risk**

But when are market participants actually exposed to such volatilities? This depends on how precious metals are purchased. In a nutshell, precious metals can either be bought on a spot basis, or on a forward basis. To some extent, the precious metals can be leased, when the required metal volumes are returned in the loop through precious metals recycling of used gauzes. The first two options shall be considered more closely in this article, especially taking into account the continuous demand of precious metals caused by losses during the operation.

**Buying on a spot basis**

When metals are bought on a spot basis, market participants are fully exposed to price volatility as they buy their metals the moment they have a purchasing need. With an implied volatility of currently approximately 16% for platinum on a 60-day basis, it can consequently affect the profit and loss statement significantly.2 So while prices can be lower at the time of purchase, in the worst case scenario, the platinum price could be approximately 16% more expensive than the last time the metal was acquired, so profitability and liquidity can be affected substantially.

Another aspect companies need to consider is the time of metal consumption, because most of the time the total precious metal volume, or at least parts of it, are only needed at a later point in time. In this case, buying the total volume now for usage at a later time, and therefore initially storing the metal, would result in a fixed price for all partial or complete usage in the future. However, it would immediately increase capital commitment at the time of purchase and affect the company’s cash flow.

**Buying forward**

At times when market prices are comparatively low, it may be useful to consider hedging or ‘fixing’ current metal prices for the metal consumption at a later point in time. This can be done in several ways. The first option is the one described above: companies buy the total volume and store it for later usage. By doing so, all alleged future price fluctuations are cleared out of the way and the required metal volumes can be gradually withdrawn.

In case the metals will be consumed partially throughout a certain period of time in the future, it is recommendable to only hedge the price today for a pre-defined term without actually buying the total bulk of the precious metals volume at the time of price hedging. The latter also secures metal prices for the respective hedging term without engaging prompt capital commitment in the beginning. Buying forward thus eliminates the risk of rising prices in the future by providing a fixed calculation basis and reliable budgeting.

Hedging the precious metals price today for a specified quantity of the metal for a pre-defined term while having the maximum flexibility with regards to time and volume of purchase at the hedged price gives companies maximum room for manoeuvre.

**Concerns regarding palladium usage**

As mentioned earlier, under the Ostwald process, considerable quantities of volatile platinum and rhodium oxides are formed and are carried off by the gas flow. At the end of the campaign, this leads to substantial losses of platinum and rhodium. In the 1960s, a way to minimise losses was found by installing palladium gauzes underneath the platinum catalyst. This enables a large portion of the lost metals to be caught by a reaction between platinum dioxide in the gas phase and metallic palladium, resulting in palladium oxide. However, as a course of this reaction, a part of the palladium is also lost.

The price of palladium has been facing continuous growth throughout 2017 – 2018, outperforming platinum and rhodium, and, at a certain stage, leading to great concern of the operators of nitric acid plants regarding the economic feasibility of palladium usage. Questions and remarks like ‘should we stop using palladium completely?’ or ‘please design a completely palladium free system’ have been circulating on the market since the end of 2017.

Within nitric acid plants, a distinction is made between atmospheric, medium pressure and high pressure processes depending on the type of the plant, keeping the correlation of the losses from low at the atmospheric plants to considerably higher at high pressure plants. However, in all types of plants, the amount of lost palladium is substantially lower than the amount of reclaimed platinum and rhodium. The proportion between the lost and reclaimed amount depends on the type of the plant. The situation is more critical for high pressure plants as here the economical gap between palladium and platinum/rhodium prices is smaller. Still, currently for all types of plants, palladium installment definitely makes sense. This article will now take a more precise look at the recent developments on the precious metal market.

**Platinum, palladium, rhodium – a brief review and outlook**

Palladium showed a remarkable performance in 2017, with a value increase of almost 60%. This has mainly been driven by a tight supply situation in combination with robust demand from the automobile industry. Palladium benefitted particularly from strong auto sales in the US and China, which are the two largest auto markets in the world. The metal also benefitted in light of...
ongoing Dieselgate discussions concerning the ban of diesel engines in major cities around the world. Being applied in petrol engines, palladium was therefore increasingly the focus of attention in the automobile industry to the detriment of platinum, which is primarily applied in diesel engines. Thus, palladium truly became the star among precious metals in 2017. The deficit situation is not expected to change in 2018, providing a robust foundation for further upside potential. However, analysts agree that a great deal of price-backing factors have already been priced in so that even slightly less favourable news may induce profit-takings and pull-backs in the palladium price. On the charts, palladium showed a quite stable upward price development throughout the entirety of last year. Not surprisingly, however, just in time for the new year, the metal has shown some volatile up and down movements caused by the aforementioned profit takings year-to-date.

Platinum, on the other hand, has undergone the usual volatile value development, partly overhauling and being overhauled in value by its sister metal throughout the last year. As mentioned, it has been Dieselgate in particular that has taken a toll on the platinum price. However, this is ‘old news’ by now and by far already considered in the platinum price by the market.

As reported by Heraeus in the annual forecast, fundamentals are expected to improve in 2018. Further cuts on the supply side are expected to back up the platinum price this year. Many of the South African mines have been struggling with low commodity prices and high costs of production throughout the past few years, resulting in the closure of some unprofitable mines and shafts. Thus, mine supply is expected to fall by 1% in 2018. Furthermore, a rise in commercial vehicle sales and the related platinum demand growth is partially offsetting the decline in diesel car sales at the moment.

Additionally, positive outlooks for platinum jewellery, as well as industrial demand, could give more support to the platinum price this year. Hence, it remains to be seen whether platinum may be trading at a premium again against its sister metal palladium in the longer-term, increasing the platinum-to-palladium ratio in parallel.

Rhodium, as a by-product of platinum mining and its use in autocatalysis representing over 80% of total demand, basically follows the same fundamental data as platinum. Consequently, rhodium is also affected by the tight supply situation currently also being marked by higher lease rates. Demand-wise, all eyes are on the automobile industry. While rhodium usage in the US automobile market, as well as the global automotive demand, are expected to slightly slip this year, it remains to be seen whether China and other emerging markets can offset the dip causing more price volatility in rhodium.

The high value of the precious metal installment used for catalyst gauzes makes it necessary to closely follow the developments in the market with the aim of finding the best possible financial solution. However, mitigation of risks is also a recommended part of the solution by implementing different smart options. The platinum-to-palladium price ratio has not changed from the typically traded way. Heraeus is keeping an eye on it.

References
2. Thomson Reuters. 23 April 2018.
3. Heraeus Precious Forecast 2018; Thomson Reuters Price Charts.