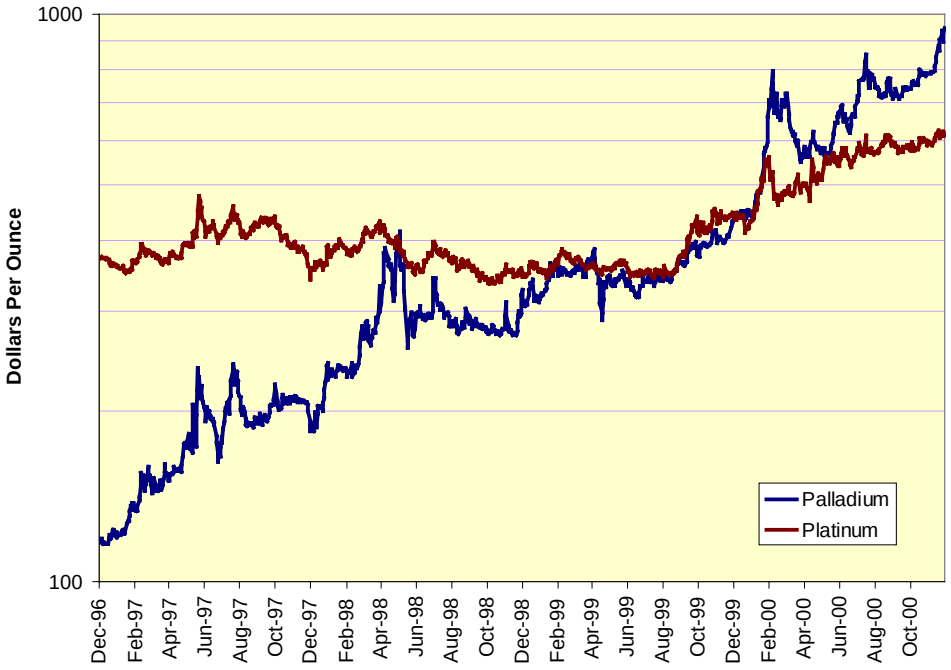
Platinum And Palladium: Catalysts For Change

The Lord works in mysterious ways. The modern information economy is based on silicon, a material in its raw form literally as abundant as sand on a beach. And, to top it off, silicon is every bit as cooperative to work with as steel, the basic material of a previous age. Yes, you can make faster chips and switches out of gallium arsenide and indium phosphide, but they're both more expensive and more difficult to fabricate than silicon. Let's not even start on fiber optics versus copper wires.

Then we have those rare birds of the platinum group, which includes iridium, rhodium, ruthenium, and osmium in addition to the two most widely used members, platinum and palladium. Their natural abilities to catalyze assorted chemical reactions, particularly for hydrocarbons, have made them so useful that they are involved in the manufacturing of nearly 20% of all goods in production.

The combination of a strong global economy and snags in Russian exports (Dear God, if you knew what sort of people the Russians would be, why did you give them all those resources?) have propelled platinum and palladium prices on a path reminiscent of a late 1970s inflationary binge.

Rocket From Russia: The Platinum/Palladium Markets



If you're wondering why palladium prices have increased more rapidly than and now exceed those of platinum, the answer is simple. Automobile manufacturers started switching to palladium-based catalysts for exhaust systems to take advantage of its lower price and greater availability. This is the same sort of self-defeating economic logic that gave us $9.00 natural gas prices once utilities started to demand the cheaper fuel.

The demand curves for the two metals have been increasing in linear fashion for years -- the demand for palladium alone rose by more than 35% between 1996 and 1999 -- and given the economics of catalysis, why shouldn't they? Catalysts, by definition, are not consumed in the reaction, and while there is a physical loss rate associated with recycling and regenerating the materials, it always makes sense to do so. At what price for catalysts will an oil company shut down a refinery? If the catalyst costs for an automobile muffler double, will people cease to drive cars?

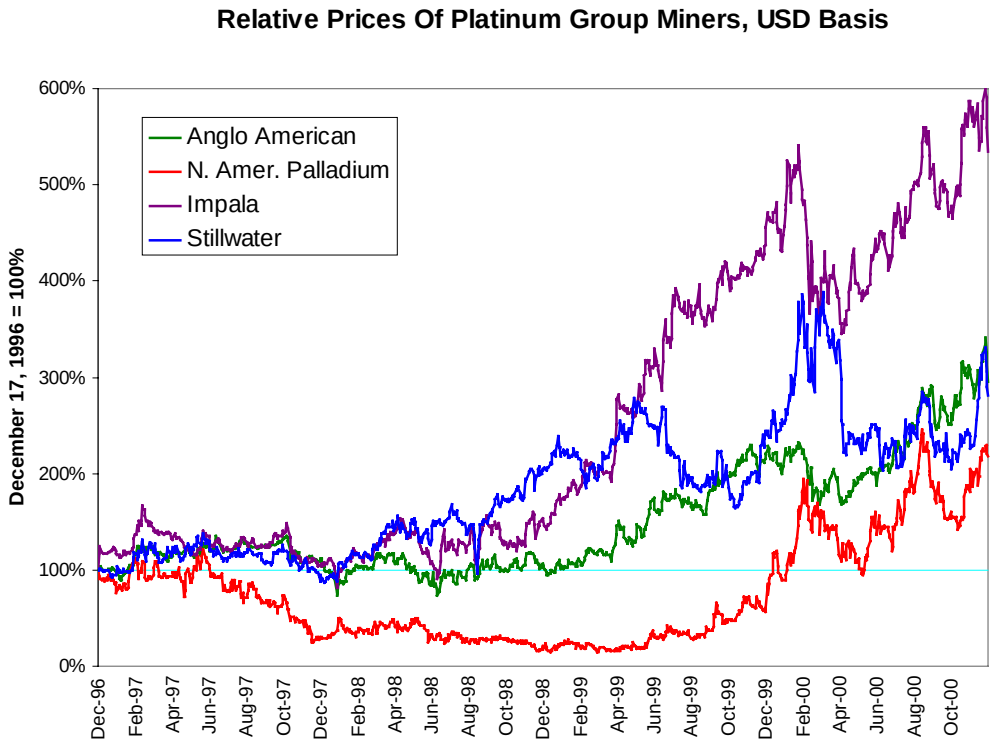
The price elasticities for both supply and demand, therefore, are very inelastic. Not only will catalysts users continue to pay, but suppliers are faced with a similar and opposite curve: Should the price fall under increased supply, users are not going to suddenly become profligate in their demand.

These conditions suggest 1) that suppliers in aggregate can achieve higher profits by withholding supplies, a task made easy when a single source like Russia is capable of doing so, and 2) that as is the case in all cartels, failure and price collapse will be both sudden and inevitable.

Catalyst economics also suggest that the forward curves of these futures, which are traded on the NYMEX, should behave more like those of base metals like copper and nickel, as opposed to those of precious metals, such as gold and silver. Specifically, these curves should and do exhibit backwardation, or futures prices trading below the cash price level to reflect producer anxiety over price declines and buyer willingness to maintain minimal inventories. Let's see how higher prices and backwardation are reflected in the share prices of selected mining firms.

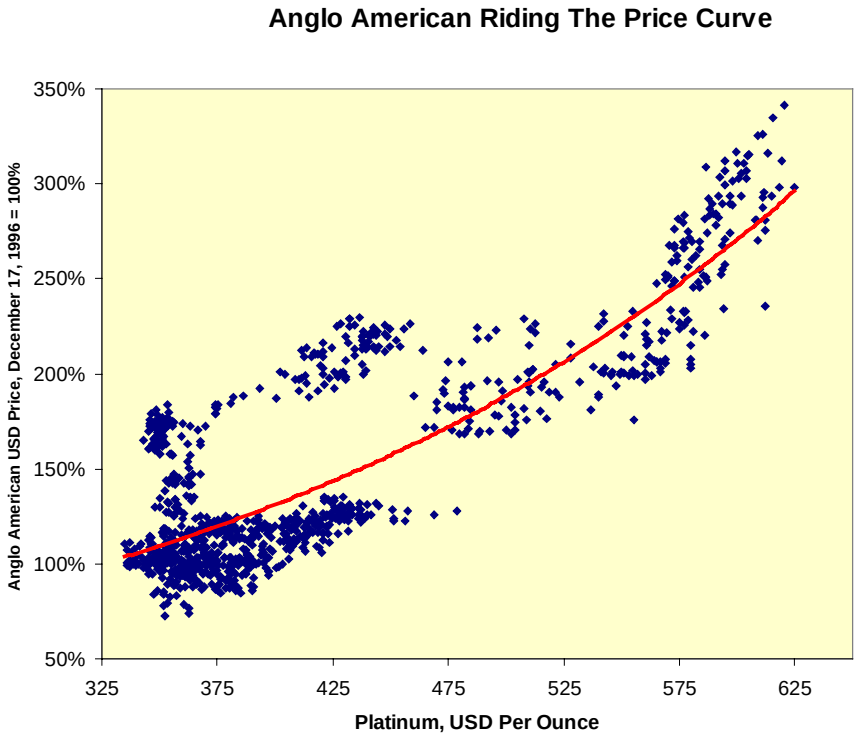
Mining Some Profits

While it would be nice to include a major Russian producer such as Norilsk Mining in the comparison below, the history and reliability of Russian data has been distorted for various reasons. Let's include two South African firms, Anglo American Mining and Impala (also known as Implats), a Canadian firm, North American Palladium, and an American firm, Stillwater Mining. After converting the share prices to a USD basis, we can see how these firms' share prices have followed generally parallel growth curves, but at vastly different rates of ascent. Impala's performance dwarfs the others, but none of these firms have suffered the poor performance associated with many other mining shares.



If the ascent curve resembles the metals' curves, this is no accident. Just as gold mining shares frequently move in advance of bullion prices and at a more rapid rate, the same applies here. We can take the curve for Anglo American as a function of platinum prices and derive a neat statistical relationship:

$[Anglo_{ti} - Anglo_{t0}] = .308 * \exp(.0036 * platinum)$, $r^2 = .65$



These relationships suggest some interesting trading opportunities, such as buying the South African miners, selling the South African rand (ZAR) forward, and then hedging the metal price component with put options. The metal will fall faster than the stock, and the stock will rise faster than the metal. This could be the most fun anyone has had with palladium since the great cold fusion story of 1989.