Are Gold Options Too Cheap?

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While a range of commodities, including crude oil and iron ore, have been on a wild ride over the past twelve months, gold has been comparatively stable. As such, options on gold have spent much of the past several months trading near a record low in terms of implied volatility (Figure 1). Is the market underestimating the risk in holding gold?

The direction of implied volatility on gold options is closely, but not perfectly, linked to the direction of gold prices. In gold, as in equities, implied volatility tends to rise when prices are falling more so than when prices are rising. Measured daily over the period from November 2010 to July 2015, the correlation between changes in implied volatility on three-month constant maturity options on gold futures and gold prices, stood at -0.38. So, while rising implied volatility isn’t exactly the same thing as falling gold prices, the two are related (Figures 2 and 3). If one is worried about an increase in gold option implied volatility, one should probably also be asking what could cause gold prices to fall?

Figure 1.

Figure 2.
Before we delve into reasons why the price of gold might fall, it is worth noting that implied volatility on gold options has risen during gold bull markets in the past. Notably this was the case in August and September 2011, just as gold reached its all-time high (nominal) price in US Dollars. At that time investors appeared to be buying protection in the event that gold prices fell. Fall they did, and as they fell gold implied volatility pushed even higher, peaking at 36.2% annualized on constant maturity 30-day options on gold futures. Since then, however, gold implied volatility has basically only risen when the price of gold has fallen and vice versa. So here are several reasons why implied volatility on options on gold futures could rise.

1) Implied and Realized Volatility are Abnormally Low

Currently, with gold options trading near a record low in terms of implied volatility (12.1% as of July 14, 2015 and up to 18.8% on July 21, 2015), there is little scope for gold implied volatility to decline further. By contrast, there is a great deal of room for it to go higher. A large part of the reason why gold implied volatility is so low currently is that annualized realized volatility has been exceptionally low as well, around 8.7% over the past 30 days. Since 1975 it has averaged around 17%, nearly double its current level (Figure 4). Since November 2010, when the implied volatility series available in Quikstrike begin, realized and implied volatility have both averaged 16%. So, whether you compare it to long run or intermediate term averages, realized gold volatility has been exceptionally low.

2) Increases in Mining Supply Could Drag the Price of Gold Lower

As we pointed out in our paper, “The Push-Pull Dynamics in Gold & Silver,” mining supply explains as much as 50% of the year-to-year price variation in precious metals. Moreover, gold supply influences both silver and gold prices, as does silver mining supply. The more supply, typically the lower the price.

Gold mining supplies have grown strongly since 2009. This growth may have put downward pressure on gold prices, helping them to fall by approximately 40% since September 2011. As a result of this decline, some observers forecast that gold mining supply might begin to contract by as early as the second half of 2015.

We are skeptical. While the current price of gold, around $1,150 per ounce, is far below its high of around $1,900 from September 2011, the current price still exceeds most estimates of the cost of production. Globally, the all-in sustaining cost of running a gold mine is around $982 per ounce, according to Metals Focus (Figure 5). Thus, at the current price, there is reason to believe that investment in new mines might taper off, as might the expansion of existing mines (at least relative to the torrid pace of expansion in the past decade), but there are not a lot of reasons to think that currently operating mines will slash production.
Moreover, the cash cost of running a gold mine, on average, is just above $700 per ounce. This may be the more relevant indicator when it comes to the level at which gold production might be cut back. In fact, if one looks at gold mining costs country by country, the current price exceeds the all-in costs in almost every case and exceeds the cash costs without exception (Figure 6). Since running a gold mine is a cash flow positive business at $1,150 per ounce, so long as the price remains at or above current levels, there is no particular reason to think that gold mining production is going to decline.

If gold mining production defies expectations and continues to rise, this could put downward pressure on the price of the yellow metal and this, in turn, would likely send the implied volatility of options on gold futures contracts higher. On the other hand, if gold mining production does decline, then it should support gold prices and this, in turn, might keep implied volatility on gold options near historic lows.

It is worth pointing out that after gold prices collapsed in the early 1980s, mining supply continued to rise for another eighteen years (Figure 7). This underscores the point that once capital investment goes into a mine, it becomes a sunk cost and that mine needs to continue to produce until the point at which it goes cash flow negative. Moreover, as McKinsey & Company points out in its recent report, “Productivity in Mining Operations: Reversing the Downward Trend,” there is enormous potential to make metals mines of all sorts more productive. To the extent that this is accomplished in coming years, it will lower the price at which gold can be profitably mined.

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Figure 5.

*Global Average Production Costs of Gold*

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Figure 6.

*Gold Production Costs by Country*

3) Gold Prices are Defying Gravity with Respect to other Commodities Such as Crude Oil

Crude oil led gold prices higher during the most recent commodity bull market. Crude oil began to rally in 1999, three years before gold began its long upward trek. Likewise, oil prices peaked in 2008, also three years before gold hit its all-time high in 2011 (Figure 8). Given oil’s massive collapse in 2014 and its inability to sustain a rally amid an inventory build-up in 2015, one must wonder whether or not gold might follow it lower.

The oil-gold ratio is no longer near historic highs (see our paper in February, “Oil-Gold Ratio: Dial Down Deflation Concerns”). At 22.7 barrels of West Texas Intermediate Crude (WTI) / Troy Ounce of Gold, it is still higher than its historical average of 16. If one, hypothetically, held the price of WTI constant and allowed the oil-gold ratio to return to its historical average, this would imply a gold price of around $800/ounce – not too far above its break-even cash flow
cost of mining. Of course, there is no particular reason to think that the oil-gold ratio should or will revert to its long running historical average any time soon. That said, if it did, it would likely send the implied volatility on gold options a great deal higher.

The silver-gold ratio is also trading a bit higher than it has historically as well (figure 10). Given the partial substitutability of the two metals, this also might not be a great sign for gold. Jewelry makers and investors might prefer to use silver rather than gold given the larger-than-normal price disparity.

4) Monetary Policy and the U.S. Dollar

Federal Open Market Committee (“FOMC”) Chair Janet Yellen has made clear that she and (most of) her Federal Reserve colleagues would like to raise rates before the end of 2015. For the moment, the markets are skeptical. Fed Funds futures don’t fully price in a rate hike until Q1 2016. Moreover, Yellen has given the FOMC some wiggle room, clearly indicating that the Fed is data dependent. For its part, the data has not always been cooperative. While employment, total labor income and the housing sector are growing solidly, retail sales have been sluggish (1.8% annualized growth ex-autos and gasoline in H1 2015), and inflation has remained abnormally low.

What matters for gold isn’t so much the actual Fed move, when and if it occurs, but rather how the expectations of a Fed move develop over time. Day-to-day changes in gold prices have exhibited an increasingly negative correlation to the day-to-day movements of Fed Funds futures rates (Figure 11).
As such, any economic data or policy pronouncements from the FOMC that bring forward expectations for a rate hike, will more likely than not send gold lower, and by extension, send the implied volatility of gold options higher. Of course, the opposite is true as well. Weak economic data that diminishes expectations of a Fed rate hike will probably support gold. Indeed, the significant decline in expectations for Fed rate hikes in 2015 and 2016 (Figure 12) may be one factor that has supported gold in recent months and prevented it from following the likes of crude oil, silver, and iron ore off the cliff.

Additionally, if Fed rate hike expectations are brought forward (meaning more rate hikes sooner than currently priced) it would also likely support the US Dollar. A strong USD is probably bad news for gold and other commodities. As we have pointed out in previous articles on gold, the price of the yellow metal has been relatively stable from the perspective of some of the world’s weaker currencies such as the Indian Rupee, the Japanese Yen, the Russian Ruble, and the Brazilian Real. While that information is interesting, it doesn’t change much the implied volatility of gold options, which is based on the USD price of gold.

**Bottom Line**

Don’t be lulled into complacency by the low level of realized and implied volatility in gold. While diminishing expectations of a Fed rate hike earlier in 2015 may have prevented gold from following other commodities on a dramatic downward path, given the abnormally low level of volatility, the potential for changes in U.S. monetary policy, and the prospects for increasing mining supply, there remain significant downside (and upside) risks to gold that could drive up volatility. After all, gold is typically bought as a hedge against inflation – of which there is none – or as protection against financial disasters – central banks have the markets’ back for now. While history is not always a good guide, caution is advised since we may be experiencing the calm before the next storm.