The 2013 Copper & Gold Conundrum

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It is a riddle wrapped in a mystery inside an enigma; but perhaps there is a key.
Winston Churchill referring to Russia, radio broadcast, London, October 1, 1939

The interplay between copper and gold can be as frustrating to comprehend as the relation of Russia to her steadfast World War II allies as Churchill’s headline quote so eloquently states. Although at times perplexing, the relative performance of these two super-metals can be as revealing about markets as the clash of super-powers was to the history of the last century.

Copper with its myriad industrial applications is a reliable bellwether of global growth and contraction. Gold reacts variously to global developments as a commodity, an alternative monetary unit or a safe-haven in crisis. Looking at the two metals together provides a broad view of current market forces and decoding their changing relation holds a key to future market direction.

A two-year retrospective

A scatter plot of copper and gold prices is a powerful way to analyze the journey of the red and yellow metal over the last two years. In Figure 1, copper price is plotted versus gold for the most active Comex futures contracts of 2011 and 2012 (Ref 1 & Ref 3):

![COMEX Copper vs Gold 2011 & 2012](image)

**Figure 1 – Comex Copper & Gold Price Domains**
The points represent the price pair in U.S. dollars for all the market days over this period (triangles, 2011; diamonds, 2012); the lines connecting these data are the respective price trajectories. The Aug. 5, 2011 U.S. debt downgrade (big red triangle) bifurcated copper and gold prices into two distinct domains circumscribed by dotted ellipses. **Aug. 5, 2011 proved to be a critical tipping point for base and precious metal markets and is the single intersection of the two price domains.**

"Price Domain A" within the upper-left ellipse marks a period where QE2-fueled copper price reached an all-time intraday high of $4.7175 per pound on February 15. Gold gradually rose in U.S. dollar price over this period but was initially outpaced by both copper and oil (Ref 2).

"Price Domain B" in the lower-right corner captures the post-downgrade crash in copper prices and gold's surge to a new-record high of $1,923.7 per ounce on Sept. 6, 2011. At that time gold was in safe-haven mode and copper retreated to bear country plumbing low-$3 per pound levels in early October. As the year closed the yellow metal returned to mid-$1,500 per ounce territory joining copper in the bear camp.

**Importantly, the entire record of 2012 copper and gold prices has bearishly remained trapped in Price Domain B.** The first three trading days of 2013 are shown in Figure 1 as red squares and lines. Although copper has enjoyed a significant rally from its mid-November lows, the copper-gold price pair lies rather sheepishly near the center of Price Domain B.

Table 1 uses the gold-to-copper price ratio (GCR) to illustrate the wild swing from copper-bullish to copper-bearish conditions for both domains.

<table>
<thead>
<tr>
<th>Date</th>
<th>Gold:Copper Ratio (lb/oz)</th>
<th>Market Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-Feb-11</td>
<td>291</td>
<td>Copper-Bullish 2011</td>
</tr>
<tr>
<td>5-Aug-11</td>
<td>399</td>
<td>US Debt Downgrade</td>
</tr>
<tr>
<td>3-Oct-11</td>
<td>538</td>
<td>Copper-Bearish 2011</td>
</tr>
<tr>
<td>20-Feb-09</td>
<td>621</td>
<td>Copper-Bearish 2009</td>
</tr>
</tbody>
</table>

Table 1 – Important Gold-to-Copper Ratios

In February, 2011 an ounce of gold bought as little as 291 pounds of copper; in October an ounce could fetch as much as 538 pounds. The highest (i.e. most bearish ratio) during the 2008-2009 financial crisis was 621 pounds per ounce. A range of 300 to 400 pounds per ounce was typical prior to the financial crisis – ironically, the ratio on Aug. 5 was 399.

The plot in Figure 2 combines the ratio data in Table 1 with the previous chart. GCRs of constant value appear as straight lines whose slope is the inverse of the ratio:
Figure 2 – Comex Copper & Gold Constraint Boundaries

Price Domain A falls between the “Cu-Bullish 2011” green line and the 400 per pound dotted reddish-brown line. Price domain B is below the threshold and above the “Cu-Bearish 2011” red line. The “Cu-Bearish 2009” dark red line is included to indicate a low-price constraint boundary given the recent history of the Great Recession.

…but perhaps there is a key

What keeps the gold-to-copper ratio from returning to pre-recession levels of normalcy? Why is it increasingly difficult to breach the 400 pound per ounce boundary? The Fig. 3 time plot of the GCR from early-August 2011 to Friday’s close provides an important clue:
Copper has been steadily losing relative value to gold since mid-2006; in those days an ounce of gold fetched roughly 200 pounds of copper, presently the same amount can purchase nearly 500 pounds. This is illustrated by a 6+ year linear fit of Comex GCR data shown by the green line of Fig. 3. Its slope from the lower-left to upper-right corner represents ratio expansion – a typically gold-bullish/copper-bearish condition. The linear model is reasonably accurate (R2 > 0.62) with a standard deviation (1-sigma) of 63.4 pounds per ounce from trend. Plus and minus 2-sigma boundaries are shown by the dashed green line pairs.

The 2012 day-to-day GCR (reddish brown triangles) remained benignly within a +/- 0.5-sigma band about the long-term trend. By contrast, 2011 witnessed a nearly 2-sigma deviation following the U.S. debt debacle as the GCR touched 538 pounds per ounce on Oct. 3, 2011. The 2012 data experienced a dramatic mean reversion this fall with the 3-month average (solid reddish brown curve) and trend line converging in magnitude and slope. This period is indicated by the gray dashed circle labeled “The Grand Reversion” (Ref 4).

It is encouraging when a model agrees with reality but it makes crossing the 400 pound per ounce boundary statistically more difficult as time marches on. On the fateful Aug. 5, 2011 U.S. debt downgrade, the boundary was only 0.4-sigma from trend. At Friday’s close, 400 pounds per ounce is a full 1.3-sigma distant. However, the short 3-day record of 2013 has already seen a 0.6-sigma ratio.
compression (blue dotted line), moving copper and its 3-month average away from trend and bullishly closer to 400 pounds per ounce (green arrows).

Unwrapping the riddle?

R.J. O’Brien & Associates has recently cited three factors that will determine the fate of the red metal in 2013: the strength of Chinese demand with their economy on the mend, whether or not the expected surge in new mine supply in 2013 actually materializes and how active macro funds will be in the copper market (Ref 5).

No matter what happens, if the long-term value trend of Fig. 3 persists, it will be harder to escape bearish Price Domain B in 2013 than in 2012. For instance, if gold prices reach $2,000 per ounce this year as some analysts predict, copper prices would need to exceed $5 per pound to return to bullish Price Domain A. With the expectations for the third round of U.S. quantitative easing now lowered in scope and duration, $5 copper seems a stretch for even the most optimistic.

A bearish scenario would be a repeat of the 2011 U.S. debt crisis if fiscal wrangling and a second debt ceiling debate send markets in a tailspin. If $2,000 gold results from a safe-haven play, risk assets like copper could test the bearish 2011 or even 2009 boundaries of Fig. 2. This suggests a return to low-$3 per pound copper but the price lows of the 2008-2009 financial crises are unlikely.

If 2013 gold prices are pressured to the downside (e.g., on rising interest rates) and fall to $1,600 per ounce or below, $4 copper certainly becomes a more realistic entry point to Price Domain A. However, rising copper prices and falling gold prices rarely produce a sustainable bull market for the red metal. The better environment for both occurs when gold behaves as commodity and prices move in tandem (i.e. positive gold-copper correlation).

To date, copper prices are headed in the right direction for 2013 as the gold-to-copper ratio compresses away from trend but this bullish departure may be short-lived. Without a breakdown in the 6+ year trend, copper is likely to remain in bearish Price Domain B until there is a return of robust global growth.

Borrowing a second phrase from Winston Churchill, it may be some time before copper moves “forward into broad, sunlit uplands.”

References:
Ref 1: Copper and Gold Plan Their 2012 World Tour (Richard Baker, Kitco commentary, Jan.29, 2012)
Ref 2: Gold vs Copper, Oil and Silver: The Value Trend Is Your Friend (Richard Baker, Jul.23, 2012)
Ref 3: Copper and Gold - The QE3 Gordian Knot (Richard Baker, Kitco commentary, Sept. 17, 2012)
Ref 4: Copper and Gold - In the Eye of the Storm (Richard Baker, Kitco commentary, Oct. 30, 2012)