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Mind the gap: Psychological barriers in gold and silver prices

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ABSTRACT

This study tests whether psychological barriers exist around key reference points in gold and silver prices, namely numbers ending in 0 (e.g. $450) and 00 (e.g. $200). Initial observations and tests show gold prices fix less frequently on values ending in 0 and 00, suggesting barriers at these levels which manifest as gaps in the frequency distributions. Statistical tests find support for barriers at numbers ending in 0 and 00 for gold. While initial observations and tests suggest silver prices are not uniformly distributed, there is no statistically significant evidence to support that barriers exist at either 0 or 00.

1. Introduction

As two of the oldest financial assets gold and silver have a unique psychological relationship with investors. While neither provides a yield both are seen by many as true assets as they are free from counterparty risk. There is however scant research around behavioral issues in precious metals (PMs), see O'Connor et al. (2015) for a full review. That markets believe psychological barriers exist in PMs is evident in many press reports on the market[1].

Using intra-day data from 1975–2015 this paper examines whether barriers exist at psychologically important price levels in gold and silver, providing the first evidence for silver and expanding Aggarwal and Lucey's (2007) findings on gold.

It is an opportune time to examine this issue as price volatility for both metals has been high recently. Gold and silver prices peaked near $1,900 and $50 an ounce in 2011, the highest since the Hunt Brothers cornered the silver market. Fig. 1 shows that as the effects of the 2007/8 financial crisis faded and gold's safe haven property became less important to investors (Baur and Lucey, 2010) their price declines have been dramatic - with gold and silver prices falling by over $700 and $30 from their peaks.

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[1] *"When gold futures prices pushed below the major psychological and technical level of $1500.00 on Friday it was a "game-changer" from a longer-term technical perspective." (Kitco News, Forbes.com Special Report 12/04/2013) "Gold rises for third day; hits resistance at $1700 per ounce" (Reuters.com 04/09/2012) "The next downside price breakout objective for the silver bears is closing prices below major psychological support at $30.00." (Kitco News, Forbes.com 25/01/2012).*

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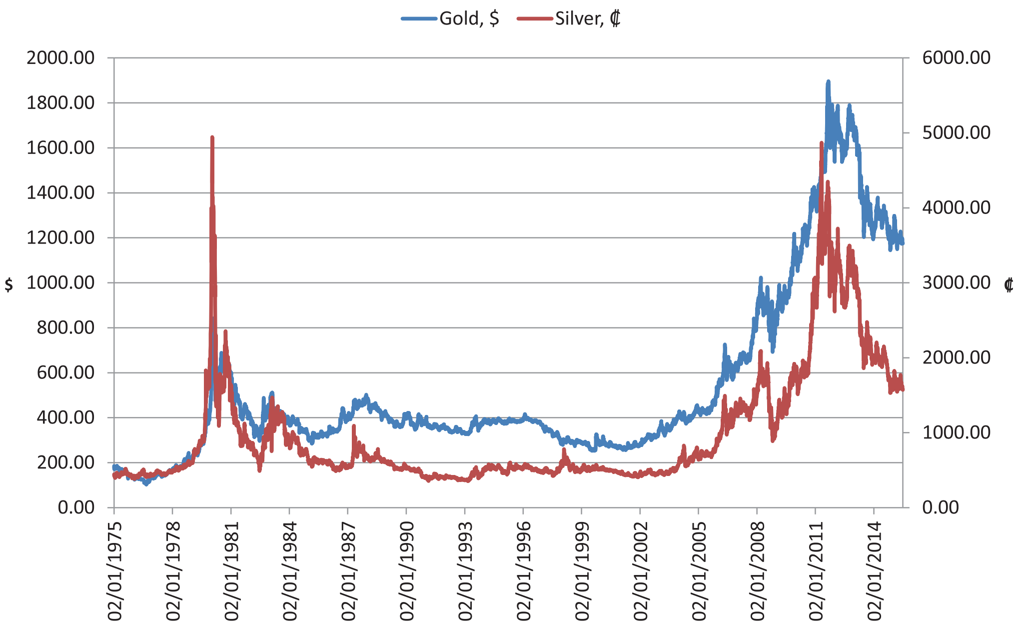

Fig. 1. Gold and silver prices.

2. Reasons for psychological barriers in asset prices

If markets were always rational and efficient then we would not expect to see any significant psychological barriers in precious metals prices. Despite this, the existence of psychological barriers in markets is taken almost for granted with suggestions of resistance levels and support levels whenever an asset reaches a number ending in 0, 00 or 000.

Research suggests that the existing decimal place-value system encourages individuals to think in multiples of ten, and encourages rounding (Mitchell, 2001). In marketing literature cognitive accessibility is the accepted reason for “even-ending” prices (round numbers ending in 0). Consumers tend to identify with round numbers (Palmon et al. 2004).

A growing number of economists have come to interpret the anomalies seen in financial markets as being consistent with several irrationalities individuals exhibit when making complicated decisions. These irrationalities stem from two main premises, information processing and behavioral biases. For example, the concepts of anchoring and heuristic simplification in behavioral finance are closely related to the issue of psychological barriers in asset prices. The concept of anchoring draws on the tendency to attach or "anchor" our thoughts to a reference point - even though it may have no logical relevance. Heuristic simplification is the reliance on simple heuristics or other such methods to make decisions. Kahneman et al. (1982) found that the anchoring effect is so strong that it still occurs in situations where the anchor is random. Another bias closely linked with barriers is herding (Avery and Zemsky, 1998) the tendency for individuals to mimic the actions of the group, whether rational or irrational.

Westerhoff (2003) develops a formal model of how traders cluster their expectations around round numbers in forex markets. Mitchell and Izan (2006) test for the presence of clustering and psychological barriers separately in exchange rate markets finding a clustering effect but little evidence of psychological barriers. Therefore, while the two aspects are related they are not synonymous. Clustering is a necessary, but not a sufficient condition, for a psychological barrier to exist.

Psychological barriers have been shown to exist in a number of traded financial assets. Aggarwal and Lucey (2007) show that at the 100’s level gold reaches a point where it is less likely to continue on an upward or downward price path. In particular it is shown that gold’s volatility changes when its price is near or has just crossed a barrier especially when price is falling. In oil prices Dowling et al. (2014) find barriers for Brent crude oil prices but not WTI at the $10 level, with the effect dissipating post financial crisis.

3. Data

We use intraday gold prices composed of the London AM and PM fix which take place at 11.00 am and 3.00 pm GMT from 02/01/1975–30/06/2015 (20,452 observations) and daily silver prices from the London fix over the same period. Both are available from the LBMA website.

4. Testing for psychological barriers

Three broad approaches have been advocated to examine the existence of psychological barriers in asset prices: