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Reassessing the role of precious metals as safe havens–What colour is your haven and why?☆

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ABSTRACT

The role of gold as a safe haven asset has been extensively studied in recent years. This article extends previous literature and examines time varying safe haven properties versus equities and bonds of four precious metals (gold, silver, platinum and palladium) across eleven countries. Results suggest that the metals each play safe haven roles; there are times when one metal is not while another may be a safe haven against an asset. The second part of this article attempts to identify robust economic and political determinants of precious metals safe haven properties applying zero-inflated Poisson regression (ZIP) and extreme bound analysis (EBA). Economic Policy Uncertainty is found to be a positive and robust determinant of a precious metal being a safe haven. This holds across countries. Stock volatility, exchange rates, interest rate and credit spreads are also found to be significant, but results are quite mixed for different markets and are fragile of model specification.

1. Introduction

The precious metals market has attracted many studies in the last half decade. There are a number of studies focusing on the role of gold as a hedge in portfolio diversification, starting from Jaffe (1989) and Chua et al. (1990). Gold as a safe haven has also been examined (see as examples Baur and Lucey (2010); Baur and McDermott (2010); Coudert and Raymond (2010) and Beckmann et al. (2015) with a general finding that it can act as such. The safe haven status of other precious metals is less well studied. It is well established, in for example Hillier et al. (2006) that gold, silver and platinum all have low correlations with stock index returns, particularly during periods of high stock market volatility; therefore, portfolios that contain precious metals perform better than equity portfolios which do not.

The term safe haven often refers to the assets suggested to investors to *"park their money"* during periods of market stress. A very large number of assets have been suggested as safe havens at various times in various studies (see Lucey and Li, 2015). Baur and Lucey (2010) provides the first *operational* definition of a safe haven which refers to an asset (e.g. stocks) that is uncorrelated or negatively correlated with another asset or portfolio in times of market stress (e.g. stock market crash or political disturbance). Assets which are hedges may not necessarily be safe havens. This concept is further developed into weak and strong safe havens in Baur and McDermott (2010). This paper evaluates the safe haven nature of the four main precious metals across a variety of countries (in local currency), shows how these vary across time, and provides for the first time evidence of the determinants of a precious metal being a safe haven or otherwise.

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2. Safe haven evidence for precious metals

2.1. Model and data

We mainly follow the standard approach to test for a safe haven, as outlined in Baur and Lucey (2010) and Baur and McDermott (2010). In identifying a daily safe haven status for metals, however, we apply a minor modification on the final safe haven dummy as explained below. For example, to test gold safe haven properties during stock market crashes, the following equations are estimated using OLS.

$$r_{gold,t} = \alpha + \beta_t r_{stock,t} + \epsilon_t \tag{1}$$

$$\beta_t = C_0 + C_1 D(r_{stock} q_5) + C_2 D(r_{stock} q_{2.5}) + C_3 D(r_{stock} q_1) \tag{2}$$

Eq. (1) models the relation of gold and stock returns. The parameter β_t is modeled as a dynamic process by Eq. (2). The dummy variables denoted as D () capture extreme stock market movements and

$$D(r_{stock} q_x) = \begin{cases} 1 & \text{if } r_{stock,t} < r_{stock} q_x \\ 0 & \text{if } r_{stock,t} \geq r_{stock} q_x \end{cases} \tag{3}$$

$r_{stock} q_x = x\%$ threshold given by the 5%, 2.5% and 1% quantile of the return distribution over the full sample period. Please see Table 2 for the values.

The decision rules follow Baur and McDermott (2010) that:

- if all coefficients, including intercept C_0 in (2), are negative, then gold is a *weak* safe haven;
- if all coefficients, including intercept C_0, are negative and significant at 10% level, then gold is a *strong* safe haven.

In some cases when the daily return falls under the 5% quantile but above 2.5% and 1%, hence $D(r_{stock} q_{2.5})$ and $D(r_{stock} q_1)$ are zeros, the above rule only applies to C_0 and C_1. In order to obtain daily safe haven status, we made a few minor modifications.

- first, we run the above regressions over a quarter (i.e. 62 days[1]). If the results meet the above requirement, we assign a preliminary safe haven dummy value as 1 to each day within this quarter;
- next, we sum up all these preliminary safe haven dummy results over the whole sample, by which accumulating results for each day from all the regressions containing this day, approximately 62 regressions on average. The result is a count falling within the range of [0, 62];
- finally, for those days in which the market return is not in the lower 5% quantile, the safe haven result is modified to 0. Hence the existence of a safe haven is aligned with exact dates of market stress.

We examine the safe haven properties of gold versus equity market movements across a wide variety of countries: United States S & P500 index, United Kingdom FTSE100 index, Germany DAX30 index, France CAC40 Index, Italy FTSE MIB Index, Switzerland Swiss Market Index (SMI), Canada S & P/TSX Composite Index, Japan NIKKEI225 index, China Shanghai Stock Exchange Composite Index (SHCOMP), Indian NIFTY50 Index, South Africa FTSE/JSE Africa Top40 Index and the benchmark 10-year government bond indices of each country respectively.[2] Our precious metal data are spot market prices in dollar for US, and in local currency for other countries. Prices in local currency are calculated by using the daily spot exchange rate against US dollar. We thus assume an unhedged investor. We cover the period from January 1994 to July 2016 for most countries. The descriptive statistics of the data are summarized in Table 1. Table 2 and Figs. 1–6.

This paper expands the Lucey and Li (2015) analysis of time-varying safe haven status of gold, silver, platinum and palladium against US stock and bond indices to eleven countries. We firstly obtain daily weak and strong safe haven results. Since strong safe haven status is extremely rare, an interesting finding in and of itself, we conduct the explanatory analysis only on weak safe haven results in the second part. For ease of exposition we show the accumulated daily and final safe haven results as a series of graphs in Appendix A (See Figures Appendix A.1–11). In these graphs we highlight on what day we find each precious metal to be a weak or strong safe haven against bonds or equities in each country. In addition, we calculate the average *percentage* of time when a precious metal is as safe haven for each country (see Table 3 and 4.) We also show the number of daily incidents when precious metals act as weak and strong safe havens across countries (see Figs. 7 and 8) and list the top ten days along with market news on that day (see Table 5).

2.2. Results of safe haven analysis

We show in Table 3 and 4 the average weak and strong safe haveness for each metal in each country, which refers to the proportion of time when a metal functions as a weak or strong safe haven over the examined time frame. As Table 3 shows, precious

[1] The average number of business days of a quarter is 62 for our sample.
[2] all data are sourced from Bloomberg