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Is gold different for risk-averse and risk-seeking investors? An empirical analysis of the Shanghai Gold Exchange

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ABSTRACT

This article aims to study the role of gold quoted on the Shanghai Gold Exchange in the diversification of Chinese portfolios using a mean-risk and stochastic dominance analysis. With the 2004–2014 period, our results show that in general, risk-averse investors prefer not to include gold while risk-seeking investors prefer to include it in their stock–bond portfolios, especially in crisis periods. This result is found to be time-varying but not time-frequency dependent and the inclusion of the risk-free asset does not induce relevant impacts. Furthermore, risk-seekers prefer including gold in an equal-weighted portfolio while risk-averters prefer including gold in efficient portfolios.

1. Introduction

Academics have been conducting research on gold investments for several decades, especially since the 1970s when the last gold standard was abandoned. Economic and financial research on gold can be divided along four principal axes.[1] The first one investigates the role of gold in the diversification of portfolios (e.g., Arouri et al., 2015; Baur and McDermott, 2010; Beckmann et al., 2015). The second one is interested in the role of gold as a hedge against inflation (e.g., Wang et al., 2011; Batten et al., 2014; Bampinas and Panagiotidis, in press). The third one studies the informational efficiency of gold markets (e.g., Gallais-Hamonno et al., 2015; Narayan et al., 2010; Westerlund et al., 2015). The fourth one assesses the relationship between gold and other precious metals and commodities (e.g., Mensi et al., 2013; Narayan and Liu, 2011; Narayan et al., 2013). Most of these studies focus on the London and New York gold markets, the biggest spot and futures gold markets in the world. In this study, we will focus on the role of gold quoted at the Shanghai Gold Exchange (SGE) in the diversification of Chinese portfolios.

To extend the literature on the role of gold in the diversification of portfolios (more details in Section 2), our choice to study the Chinese gold market is motivated by various reasons. First, China is one of the biggest gold consumers in the world. In 2015, the World Gold Council (WGC) reported[2] that China is one of the largest gold consumers worldwide, even larger than India in some periods.[3] Second, the SGE is still a "young" market (opened in 2002), compared to the one in London (opened in 1919) or New York (opened in 1974). Thus, the results obtained from a "young" gold market in an emerging country such as China may be different from the above-mentioned markets. Third, to the best of our knowledge, there are only a few studies on the Chinese gold market. However, they do not investigate the role of gold in the diversification of portfolios. For example, Lucey et al. (2014) study the relationship between gold markets around the world and find that the SGE is an isolated one and does not have significant interaction with other international gold markets. Hoang et al. (2015) study the relationship between gold and inflation in five countries from 2002 to 2013 and find that gold is not a good hedge against inflation in the long term in China. On the other hand, some other authors study the relationship between Chinese stocks and gold, such as Ziaei (2012), Anand and Madhogaria (2012), Thuraisamy et al. (2013), Gürgün and Ünalmis (2014) and Arouri et al. (2015). However, they do not take into account gold prices from the SGE but those from London converted into Chinese currency.[4] In our

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[1] See Lucey (2013) for a synthesis of research papers on gold.

[2] http://www.gold.org/supply-and-demand/gold-demand-trends.

[3] See also Cheng (2012, 2014) and Wang (2011) for more information.

[4] Mr. Cheng noted this point in an interview in April 2015 at the *Dubai Precious Metals Conference* https://www.youtube.com/watch?v=6lYnuI4X7O4.

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opinion, this choice can be appropriate for foreign investors but not for Chinese investors. Indeed, Chinese institutional and individual investors could invest in gold through the SGE only since 2004 and 2007, respectively (see Cheng, 2014, a report of the managing director of the Far East region for World Gold Council). Cheng (2014) also indicates that gold investment flows between China and abroad are still under the control of the state. Thus, using gold prices on the SGE is more appropriate for Chinese investors whose demand for gold investments has increased strongly. For example, the demand for bars and coins soared from 10 to 397 t between 2004 and 2013 (Cheng, 2014). Moreover, it is estimated that the demand for gold investment in China would reach 500 t by 2017 (Cheng, 2014). In this context, the results of this study can be useful for Chinese investors, fund managers, and banks.

Our study also extends the above literature by using the mean-variance portfolio optimization (MVPO), mean-risk criteria (mean-variance, mean-VaR, mean-Omega) and stochastic dominance approach distinguishing between risk-averse and risk-seeking investors. Although Hoang et al. (in press) also use the stochastic dominance approach to study the Paris gold market, they do not distinguish between risk-averse and risk-seeking investors. Indeed, we first employ the MVPO approach (Markowitz, 1952) to estimate the efficient frontiers for with- and without-gold portfolios in taking into account short sales. We then partition each efficient frontier into 15 portfolios and apply the mean-risk and SD comparisons to examine the preferences of risk-averse and risk-seeking investors, between portfolios with and without gold. To the best of our knowledge, it is the first study to distinguish between risk-averse and risk-seeking investors regarding gold investments. Our daily data set, from July 13, 2004 to July 31, 2014, is composed of gold prices from the SGE and stocks and government and corporate bonds from the Shanghai Stock Exchange (SSE). To check the robustness of our results, we also test for the effect of time period (based on 3 sub-periods), time frequency (using monthly data), inclusion of the risk-free asset, and preference between efficient portfolios and the equal-weighted one when diversifying with gold.

Our findings show that there are significant differences between risk-averse and risk-seeking investors. In general, risk-averse investors prefer portfolios without gold, while risk seekers prefer those with gold, regardless of whether a short sale is used. Our first robustness check on three different sub-periods shows that this result holds true for the crisis period only (10/2007–08/2011). This reflects the safe-haven characteristic of gold in the Chinese context, especially for risk seekers, since its value rises in decreasing periods for stocks (Baur and Lucey, 2010). Our second robustness check based on monthly data shows that time frequency has some impact on the mean-risk tradeoff of the portfolios, confirming the findings of Narayan and Sharma (2015) and Narayan et al. (in press). However, it does not have a relevant impact on the role of gold in the diversification of portfolios. Our third robustness check regarding the inclusion of the risk-free asset in the above portfolios also reveals the same conclusion. The fourth robustness check shows that, in most cases, risk-averse investors prefer efficient portfolios with gold, as suggested by Markowitz (1952), while risk-seeking investors prefer the equal-weighted one, as suggested by De Miguel et al. (2009). Finally, we conclude that, in general, the impact of gold quoted on the SGE is positive in Chinese portfolios for risk-seeking investors. However, this characteristic is time varying.

The rest of the paper is organized as follows. The second section details the literature review related to the role of gold in the diversification of portfolios. Section 3 presents our methodology. Section 4 discusses the results and Section 5 provides some robustness checks. Section 6 concludes.

2. Gold in the diversification of portfolios: a literature review

The first study investigating gold investments is McDonald and Solnik (1977), several years after the abolition of the Bretton–Woods system. It is followed by Sherman (1982), Jaffe (1989), Chua et al. (1990), Blose (1996), Blose and Shieh (1995), Davidson et al. (2003), and Lucey et al. (2006). These studies reveal the significant relationship between gold and stocks, and the positive role of gold in the diversification of portfolios. In 2010, Baur and Lucey (2010) and Baur and McDermott (2010) investigate the role of gold as a safe haven asset, which is defined as "an asset that is negatively correlated (or uncorrelated) with another asset or portfolio in certain periods only, e.g., in times of falling stock markets." Following these two studies, many others, for example, Hood and Malik (2013), Beckmann et al. (2015), and Ghazali et al. (in press), examine the role of gold as a safe haven in different countries. On the other hand, Wang and Lee (2011), Jain and Ghosh (2013), Reboredo and Rivera-Castro (2014a,b), and others investigate the role of gold in currency portfolios. Furthermore, Narayan and Liu (2011), Sadorsy (2014), Auer (2015), and others compare the performance of gold with other metals and commodities.

Following the ideas from Baur and Lucey (2010) and Baur and McDermott (2010) to investigate the safe haven characteristic of gold, Baur (2011) uses US data from 1979 to 2011 to conclude that gold evolved as a safe haven only recently. In assessing the impact of Asian and global financial crises on precious metals over the period 1995–2010, Morales and Andreosso-O'Callaghan (2011) show that precious metals are not affected by crises, except gold, which tends to generate effects on other precious metals. Creti et al. (2013) confirm that gold is a safe haven for stocks. Ciner et al. (2013) show that stocks, bonds, gold, and oil in the US and UK can be used as a safe haven for each other. They also find that gold can also be used as a safe haven against exchange rates in these two countries. Hood and Malik (2013) show that, unlike other precious metals, gold can serve as a hedge and weak safe haven for the US stock market. Soucek (2013) finds that in unstable periods, the correlation between gold and equity tends to be weak or negative. Gold can thus serve as a safe haven as well as offering the benefit from diversification. However, Beckmann et al. (2015) find that the role of gold as a hedge and safe haven may be market-specific. Sadorsy (2014) reveals that gold and oil can also be used as a hedge and safe haven for socially responsible stocks, in a way similar to that for conventional stocks. In comparing gold to bonds, Flavin et al. (2014) find that both gold and longer-dated bonds can be considered as safe-haven assets. Applying the wavelet approach on daily data from 1980 to 2013, Bredin et al. (in press) conclude that gold acts as a safe haven for stocks and bonds only for horizons up to one year, but this was not true in the early 1980s. Overall, the above-mentioned studies show that gold acts as a safe haven for stocks and bonds. However, it is time-varying and market-specific. These two findings are confirmed by Ghazali et al. (in press), who show that domestic gold in Malaysia, in particular the Islamic gold account, is not a safe haven during episodes of extreme drops in the stock market.

Other studies do not investigate the specific role of gold as a safe haven but rather its impact on the diversification of portfolios. For example, Hammoudeh et al. (2013) find a significant relationship between gold and stocks. Gold can thus play an important role in the diversification of stock portfolios. Kumar (2014) shows that stock + gold portfolios perform better than stock-only portfolios. Based on a wavelet analysis, Michis (2014) concludes that gold provides the lowest contribution to the portfolios' risk at medium- and long-term investment horizons. Baur and Löffler (2015), Choundhry et al. (in press), and Malliaris and Malliaris (2015) confirm the results of previous articles about the significant impact of gold in the diversification of portfolios.

Compared to other commodities, Kim et al. (2011) find that stock and commodity markets must be considered as separate markets, except for gold and oil. Narayan and Liu (2011) conclude that shocks to gold, silver, platinum, aluminum, and copper are persistent. However, this is not true for iron ore, lead, nickel, tin, and zinc. Daskalaki and Skiadopoulos (2011) show that commodities are beneficial only to non-mean-variance investors (not mean-variance ones). However, this result is not maintained out-of-sample. Using moving-average and range break trading rules, Narayan et al. (2013) conclude that the