



## Diamonds vs. precious metals: What shines brightest in your investment portfolio?☆



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### ABSTRACT

Several studies explore the use of gold and other precious metals for protecting investors' wealth during periods of market turmoil. However, alternative investments, although increasing in popularity, still remain unfamiliar to the majority of investors. We explore the safe haven and hedging properties of diamonds versus precious metals in an international study to evaluate diamonds as a viable investment alternative. Furthermore, we compare the performance between the returns of physical diamonds and diamond indices. Our analysis indicates superior performance by precious metals compared to diamonds. However, investors enjoy greater benefit from directly investing in physical diamonds rather than diamond indices. For investors looking to protect their assets against highly volatile market conditions, precious metals remain a better option. Investors should continue to keep abreast of developments with the evolution of the diamond investments industry and physical diamonds can be included in a portfolio for their downside diversification potential.

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### 1. Introduction

During times of economic distress, investors are observed to exhibit a flight-to-quality effect, where they rebalance their portfolios towards less risky securities such as fixed income and treasury bills (Abel, 1988; Barsky, 1989; Durand et al., 2010). More recently, investors have been examining the role of precious metals as a hedge or safe haven during highly volatile market conditions. Gold has been found to possess safe haven properties during extreme volatility in stock markets (Baur & Lucey, 2010). Other precious metals such as silver, platinum and palladium exhibit safe haven properties during periods that gold does not (Lucey and Li, 2013). Aside from precious metals, investments in precious stones have been shown to be effective diversifiers. Auer and Schuhmacher (2013) show that an investment in a diversified diamond portfolio can outperform a diversified stock market investment in a period of generally lackluster stock market performance. Similar conclusions are drawn by Renneboog and Spaenjers (2012) when applying hedonic regression to a unique data set of auction transactions involving investment-grade diamonds. Our work aims to contrast the respective

investment performance of precious metals and diamonds during turbulent market conditions and crises across international stock markets. With diamonds being an increasingly valuable and popular asset choice, we investigate if diamonds possess the similar safe haven qualities as precious metals and the possibility that diamonds could supersede them as a superior alternative investment option due the flight-to-quality effect.

Historically gold has always been associated with adjectives such as valuable, expensive, and long lasting. Besides the application in jewelry fabrication and coins, its versatile and stable properties also make gold a desirable element in technology<sup>1</sup> and medicine<sup>2</sup>. The demand for gold increased drastically after the Global Financial Crisis in 2008, signifying its flight-to-quality characteristics when uncertainty escalates in global markets, and subsequently resulted in a price surge (Biakowski et al., 2015). In 2015, the price of gold has dropped, yet it still remains well above the pre-crisis level. Although demand in jewelry and technology continues to decline, the growth in gold as an investment continues on an upward trend (Street et al., 2015). Diamonds on the other hand, have only been explored as a potential safe haven asset after 2000 (Popper,

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<sup>1</sup> As mentioned by Street et al. (2015), the applications of gold in technology include bonding wires and semiconductors.

<sup>2</sup> Examples of application of gold nanoconjugates in biology and medicine are regulating agents, drug carriers, and intercellular agents (Gijhohn et al., 2010).

2012). Under promotion by aggressive advertising by various diamond retail brands, it has become a symbol for romance and wealth. The steadily growing demand for diamonds poses a serious challenge to the diamond industry, as no major discoveries of new diamond sites have been made over the past two decades (Fischler et al., 2014). As the wealthy and middle-class population continues to expand in developing countries such as China and India, this will eventually lead to a widened gap between demand and supply. Currently diamonds as an investment only accounts for 5% of the entire diamond demand, as it is hindered by the lack of price transparency and market liquidity (Fischler et al., 2014). However, with the evolution of digitalization and online sales, the transparency of diamond prices will eventually be improved (Goodman et al., 2014), thus encouraging more investors to seek the asset as an alternative investment. Low volatility and stable returns are the safe haven characteristics found in precious metal investments, that make it valuable. Thus for investors who value low downside volatility and stable returns due to the economics of low supply and high demand, do precious metals or diamonds work best? More informed decisions can be made when investors understand the dynamics between diamonds, precious metals and international equity markets.

We enhance the analysis introduced by Baur and Lucey (2010) by applying the GJR-GARCH model to capture the asymmetric effects where the market returns exhibit greater volatility in response to bad news as opposed to good news. Our sample spans 8 countries, covering major economies in continents including Americas, Asia-Pacific and Europe. The effect of common precious metals have been tested thoroughly in previous studies, against stock markets, bond markets, currencies, as well as exchange rates (Baur & Lucey, 2010; Baur & McDermott, 2010; Capie et al., 2005; Ciner et al., 2013; Joy, 2011; Lucey & Li, 2013; Pukthuanthong & Roll, 2011; Pullen et al., 2014). The behaviors of diamonds have also been evaluated by several papers (Auer & Schuhmacher, 2013; Renneboog & Spaenjers, 2012). Chong et al. (2012) find long-range dependency in certain diamond categories internationally. Auer (2014) explores the returns of diamond indices and compares their performance against gold and silver. Our work is extensive as it includes four precious metals (i.e., gold, silver, palladium, and platinum) that have appeared in earlier studies, and rhodium<sup>3</sup>. We evaluate a number of diamond indices, and include high quality physical diamond prices as a more comprehensive representation of the diamond asset group. Furthermore this provides additional guidance for investors regarding the benefits of either directly investing in physical diamonds or an indirect investment with diamond indices.

Among the precious metals group, we find that gold and silver present safe haven abilities in countries like the US, Germany, France, and Australia, with the effect being relatively strong in extreme market conditions. Platinum and palladium work in selective countries such as European countries and Australia. Being a lesser-known yet indispensable member of the jewelry world, we find that as an investment choice, rhodium is just as qualified as gold. Furthermore, it is capable of acting as a strong safe haven during highly volatile times to Australia, Americans, and European countries. As the hedge or safe haven properties exerted by diamond indices are fairly limited, we conclude that it is more effective for investors to hold physical high quality diamonds to protect themselves against a volatile market. It is worth noting that although the overall performance of precious metals outperforms diamonds as alternative investments, 1 carat D flawless diamonds stand out as a strong hedge and safe haven.

The novel contribution of this paper lies in the direct performance comparison between precious metals and diamonds across several international country indices. Our study also facilitates the comparison between investing in diamond indices (indirect investment) and

physical diamonds (direct investment). Our precious metals data set is more comprehensive as it includes rhodium. Prior studies have not investigated the safe haven and hedge properties of rhodium, thus its correlation properties with different international equities' market remains as of yet unknown. Similarly, diamond prices have yet to undergo an extensive examination. As diamonds are a relatively new addition to the investment field, investors who are interested in diamonds would benefit from understanding the respective interaction between diamond index, diamond price, and the market. By comparing across commodities that share the qualities of being precious and rare assets, investors will have a greater understanding of the best options available when it comes to protect their investment portfolios during periods of market uncertainty and minimizing downside risk exposure.

The paper is organized as follows. Section 2 reviews the literature relevant to our study, including safe haven and hedge characteristics of diamonds and precious metals. Section 3 describes our data set of precious commodities and international equity indices. Research methods and our empirical models are discussed in detail in Section 4, while our analysis across different international indices is presented in Section 5. Section 6 concludes our study.

## 2. Literature review

Baur and Lucey (2010) describe that the distinction between a hedge and a safe haven rests on the duration of the negative correlation that an asset has with the market. A hedge is defined as an asset that correlates negatively (or uncorrelated if it is a weak hedge) with the market on average, and a safe haven is defined as such asset that correlates negatively (or uncorrelated if it is a weak safe haven) with the market in certain periods only.

McCown and Zimmerman (2006) demonstrate gold's zero-beta property by using the CAPM and find evidence of its inflation-hedging properties. Baur and McDermott (2010), Baur and Lucey (2010) find that gold generally acts as a safe haven against international stock markets, although at varying degrees depending on the country, and generally stronger (weaker) for developed (emerging) markets. Baur and Lucey (2010) explain that due to the influence of exchange rate fluctuations, gold is not a hedge for most indices except North America. Gold proves to be a safe haven during the peak of financial crisis periods, however the effects are exclusive to most developed markets. Similar results are shown under increased world volatility, where gold exhibits hedge as well as safe haven qualities for developed countries. They conclude that evidence suggests that investors in developed and emerging markets react to negative shocks differently. Reboredo (2013) reaches a similar conclusion, that apart from serving as hedge, gold is also an effective safe haven against extreme USD rate movements. When comparing different instruments as investment in gold, it is established that both gold bullion and gold ETFs show support for the safe haven property as opposed to gold stocks and gold mutual funds, which display very little evidence of the safe haven characteristic (Pullen et al., 2014). By analyzing both data from the US and UK market, Ciner et al. (2013) suggest the hedging role of gold against exchange rate fluctuations, and gold is found to be a consistent safe haven in the UK market. Bampinas and Panagiotidis (2015) report that on average, the hedging ability of gold against inflation is stronger in the US as opposed to the UK. For countries with a religion factor such as Malaysia, the domestic Islamic gold account gives inferior performance in comparison to official gold, during extreme market downturns (Ghazali et al., 2015). Joy (2011) states that gold does not act as a safe haven from market stress, no evidence was discovered to suggest that gold has acted as an effective safe haven. As for US dollars in particular, it is found that gold has been a valuable hedge against currency risks associated with the US dollar. Evidences found by Reboredo (2013), Joy (2011), Capie et al. (2005) support the findings that gold can act as a hedge against movements in USD. Pukthuanthong and Roll (2011) extend the research to other currencies and find that US dollars is not the only currency that gold is

<sup>3</sup> Rhodium is an important component in jewelry as it is corrosion resistant and is often used to plate cosmetic jewelry (e.g., engagement rings). The industry demand for rhodium mainly comes from automakers. Rhodium acts as a catalyst, and converts vehicle emissions into substances that are less harmful to the environment.

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