



ELSEVIER

Contents lists available at SciVerse ScienceDirect

Resources Policy

journal homepage: www.elsevier.com/locate/resourpol

Is gold a hedge or safe haven against oil price movements?

Juan C. Reboredo *

Universidade de Santiago de Compostela, Departamento de Fundamentos del Análisis Económico, Avda, Xoán XXIII, s/n, 15782 Santiago de Compostela, Spain

ARTICLE INFO

Article history:

Received 16 January 2012

Received in revised form

25 February 2013

Accepted 26 February 2013

Available online 29 March 2013

JEL classification:

C46

C58

G1

Keywords:

Gold

Oil

Hedge

Safe haven

Copulas

ABSTRACT

This paper assesses the role of gold as a hedge or safe haven against oil price movements. We use an approach based on copulas to analyse the dependence structure between these two markets. Empirical evidence for weekly data from January 2000 to September 2011 revealed the following: (a) there is positive and significant average dependence between gold and oil, which would indicate that gold cannot hedge against oil price movements; and (b) there is tail independence between the two markets, indicating that gold can act as an effective safe haven against extreme oil price movements. These results are useful for both portfolio risk managers and designers of policies aimed at using gold to preserve or stabilise oil exporter purchasing power.

© 2013 Elsevier Ltd. All rights reserved.

Introduction

Recent joint movements in gold and oil prices have renewed interest in examining linkages between the corresponding markets, given that gold and oil are major commodities and their price movements have important implications for the real economy and the financial markets.¹ Starting in early 2000 (Fig. 1), the crude oil spot price—measured for West Texas Intermediate (WTI)—gradually rose from about 25 US dollars to a historic maximum of about 145 US dollars in mid-July 2008. Meanwhile the price of gold also increased steadily until the first half of 2008 to around 1000 US dollars per ounce. Joint movement in gold and crude oil prices was also observed during the financial crisis: by December 2008, oil prices had fallen to a low of about 30 US dollars and gold prices had dropped to 800 US dollars. Related price movements persisted to a great extent after oil and gold prices turned upwards again

from 2009, to reach about 112 US dollars and 1500 US dollars, respectively, by the end of April 2011.

Explanations in the literature regarding the link between gold and oil markets refer to different mechanisms associated with the impact of oil price movements on economic variables and the use of gold as an investment asset. First, the link between gold and oil markets can be explained in inflationary terms. When oil prices rise, the general price level rises (see, e.g., Hooker, 2002; Hunt, 2006) and the price of gold also goes up, opening up the possibility of using this metal as a hedge against inflation (Jaffe, 1989). The relationship between gold and inflation has been widely studied in the literature (see, e.g., Chua and Woodward, 1982; Ghosh et al., 2004; Worthington and Pahlavani, 2007, Tully and Lucey (2007); Blose, 2010 and references therein). A second mechanism reflects how oil prices affect economic growth and asset values (Reboredo, 2010). High oil prices adversely affect economic growth and reduce asset prices, so investors turn to gold as an alternative asset to store value. Empirical studies examining gold's safe-haven status with respect to stock market movements include those by Baur and McDermott (2010) and Baur and Lucey (2010). A third mechanism was proposed by Melvin and Sultan (1990), who observed that oil-exporting countries, in particular, include gold in their international reserve portfolios; when oil prices and revenues rise, they increase their investment in gold in order to maintain its share in their diversified portfolios and this increased demand for gold leads to an increase in its price that mirrors the

* Tel.: +34881811675; fax: +34 981547134.

E-mail address: juancarlos.reboredo@usc.es

¹ Large oil price hikes have been blamed for economic recessions, trade deficits, high inflation, high investment uncertainty and low stock and bond values. Gold, on the other hand, is traded as an investment asset to hedge against inflation risk and against increasing financial market risk; more particularly, it can be used as a safe haven from market turbulence. Gold and oil may also drive the prices of other commodities (see, e.g., Sari et al., 2010).

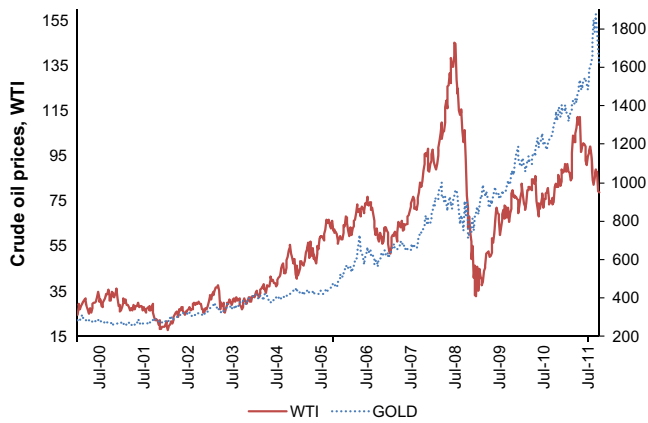


Fig. 1. West Texas Intermediate crude oil spot prices and gold prices in US dollars for the period 4 January 2000 to 29 July 2011.

increase in the oil price. Yet another mechanism reflects the fact that gold and oil are linked through the US dollar exchange rate. When the US dollar depreciates against other major currencies, investors may choose to use gold as a safe haven (see, e.g., Capie et al., 2005; Joy, 2011), thus pushing up gold prices; meanwhile, US dollar depreciation pushes up oil prices (see, e.g., Reboredo, 2012a). These mechanisms all support the argument that gold and oil prices follow quite similar behaviour patterns.

This paper endeavours to shed light upon the gold–oil price relationship by studying the dependence structure between these two commodities. Despite the fact that the different channels described above establish a positive relationship between gold and oil prices, no study to date has analysed gold–oil market co-movement while paying specific attention to tail dependence. We try to fill this gap using copula functions, which measure both average movements across marginals and upper and lower tail dependence (joint extreme movements) and so will help us determine whether gold is a hedge or a safe haven against oil price movements. Knowledge of gold and oil price co-movement is useful for portfolio managers who want to maintain a diversified portfolio and who want investment protection against downside risk. It is also useful for designing policy strategies, given the association between oil and gold and macroeconomic variables such as interest rates and exchange rates (see Soytaş et al., 2009). By studying the dependence structure between oil and gold we attempt to contribute to the existing literature in two ways. First, we assess the role played by gold as a hedge or safe haven with respect to oil prices—unlike previous studies, which have examined gold dependence on stock markets (see, e.g., Baur and McDermott, 2010) and on exchange rate markets (see, e.g., Joy, 2011). This dependence is especially relevant for countries with gold in their international reserve portfolio and, in particular, for oil-exporting countries that try to preserve or stabilise purchasing power by investing in gold. Second, we test gold–oil dependence using copulas, which model dependence structures with more flexibility than parametric bivariate distributions. More interestingly, perhaps, copulas enable us to determine whether markets are somewhat dependent or independent on average or in times of market stress; such information is crucial in determining gold's role as a hedge or an investment safe haven.

The rest of the paper is laid out as follows: Section 2 provides a brief overview of the existing empirical literature on the relationship between gold and oil prices. In Section 3, we outline the methodology and test our hypothesis. Sections 4 and 5 present data and results, respectively, and Section 6 concludes the paper.

Literature review

Studies that directly examine the relationship between oil and gold markets are few. In this section we briefly review six papers on this topic.

Baffes (2007), using annual data, examined the pass-through of crude oil price changes to the price of 35 internationally traded primary commodities. He found that the price of precious metals, in particular gold, responded strongly to the crude oil price.

Through three volatility models from the generalised autoregressive conditional heteroskedasticity (GARCH) family, Hammoudeh and Yuan (2008) studied the impact of oil prices and interest rate shocks on gold returns and the volatility of gold returns. For daily data and using an exponential general autoregressive conditional heteroskedastic (EGARCH) model, they found that oil price shocks had an insignificant effect on gold returns and reduced the volatility of gold returns.

Soytaş et al. (2009) studied, for Turkey, the relationship between oil prices and gold, silver and other macroeconomic variables using a vector autoregressive model to examine the short-run and long-run relationships between metal prices and the oil price. Based on daily data, they reported that the world oil price had no predictive power over precious metal prices in the Turkish economy.

Using impulse response functions and forecast error variance decompositions, Sari et al. (2010) analysed the effect of oil price shocks on precious metal returns and the US dollar/euro exchange rate. Their empirical evidence for daily data revealed that precious metal markets responded positively and significantly to oil prices, but only in the short-run, with the effect dissipating over the long run.

Narayan et al. (2010) examined the long-term relationship between gold and oil prices (both spot and futures) at different maturities, finding that investors used gold as a hedge against inflation and that oil and gold could be used to mutually predict prices.

Using daily data, Zhang and Wei (2010) studied the co-integration relationship, linear and non-linear Granger causality and price discovery for crude oil–gold markets. Their evidence indicated that crude oil and gold markets shared similar price trends, that there was a long-term equilibrium relationship between the two markets, that there was linear Granger causality from the oil price to the gold price but not vice versa and, finally, that there was no evidence of non-linear Granger causality.

The main feature of these studies, which partially motivates our research, is that there was no analysis of the role of gold as a hedge in a commodity portfolio or as a safe haven with respect to crude oil price movements. Evidence of gold's hedging ability against the US dollar was provided by Capie et al. (2005). Joy (2011) similarly showed, using a model of dynamical conditional correlations, that gold behaved as a hedge against the US dollar, although it was a poor safe haven. The role of gold as a financial asset was studied by McCown and Zimmerman (2006), who showed that gold has inflation-hedging ability and the characteristics of a zero beta asset, with no market risk. Gold's role as a safe-haven asset with respect to stock market movements, meanwhile, was analysed by Baur and Lucey (2010), who showed that gold tended to hold its value in Germany, the UK and the USA when stock markets experienced extreme negative returns. Additionally, Baur and McDermott (2010) showed that gold was both a hedge and a safe haven for major European and US stock markets but not for stock markets in Australia, Canada, Japan and some emerging markets.

Our article contributes to this literature by examining the relationship between gold and oil markets using copulas. The aim was to determine whether these markets are somewhat dependent or independent on average or in times of market stress.

Download English Version:

<https://daneshyari.com/en/article/985699>

Download Persian Version:

<https://daneshyari.com/article/985699>

[Daneshyari.com](https://daneshyari.com)