



# The synchronized and exceptional price performance of oil and gold: Explanations and prospects



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## ABSTRACT

This paper compares the global markets for gold and oil so as to explain the surprisingly high correlation of the two materials' prices since 1970, and the exceedingly impressive rise of both price series compared with that of virtually all other primary commodities. We propose that developments in the oil market, and the resulting effects on the macroeconomy, influenced investment activity in gold, thus providing the most plausible explanation for the two commodities' price synchronization. Our view on the extraordinary price increases of oil and gold, compared to a broad category of metals and minerals, is that oil prices rose first based on above-ground hurdles that restrained the capacity to produce, and gold prices then reacted as they were pushed up by rising safe-haven investment to store value – an attribute not shared by other metals and minerals. The paper also comments on the likely future price evolution of these important materials, arguing that oil prices will stagnate at levels observed from late 2014, or even weaken in the coming decades, but that gold prices will continue to ride relatively high – thus leading to a collapse of the oil/gold price connection.

## 1. Introduction

Fig. 1 shows the price performance, in constant money, for oil and gold, along with an index of metals and minerals prices, over 46 years. Two observations stand out from the graph. *First*, it appears that the prices of oil and gold are highly correlated (correlation coefficient 0.83, but only 0.72 for oil and metals, and 0.66 for gold and metals) over the period studied. This is astonishing, given the very differing characteristics of the two materials and their markets (see Section 2). And *second*, the two commodities have recorded quite extraordinary price increases, compared to an aggregate of exhaustible materials, represented here by a broad metals and minerals index. The price of oil recorded an impressive increase of 759% from 1970–72 to 2012–14. Over the same period, the gold price rose by 580%, while the metals and minerals index increased by a mere 38%.<sup>1</sup> These two observations dominate the agenda for our study of oil and gold, two mineral commodities with crucially important roles in human civilization. A *third* objective, addressed at the end of the paper, is to assess the likelihood or otherwise, that the price correlation of the two materials and their exceptional price performance will persevere into the future.

There is considerable literature on the economics of oil and gold and

some on the relationships between the two, and this literature is quoted and drawn upon in the pages which follow. We feel, however, that the main issues comprised in the present paper's agenda have not been adequately treated in earlier work. This provides a rationale for our effort. Moreover, it is worth underlining at this stage that our objective is not to make further theoretical or statistical advances in the subjects of focus, but instead to lean heavily on institutional conditions in deriving our findings and conclusions.

The discussion proceeds as follows. Section 2 elaborates briefly on the significance and market characteristics of the two products. In Section 3 we analyze the fundamental price determinants for oil and gold with the ultimate objective to identify the causes of the high correlation between the two. Section 4 addresses the reasons for the extraordinary price performance of both oil and gold over the past 46 years, compared to the lackluster price evolution of other exhaustible raw materials. Section 5 looks into the future and explains our view of a weakening oil-gold price correlation, and of a stagnant or falling price trend for oil compared to a more dynamic one for gold.

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<sup>1</sup> A comparison of individual mineral commodities with oil and gold does not alter the exceptionality in the price performance of the latter two up to 2014 (see Aguilera and Radetzki, 2016). By 2016, the price changes from 1970 to 72 had been reduced, but still amounted to an impressive 300% for oil and 551% for gold. Over the same years, the increase in the metals and minerals index amounted to just 1%.

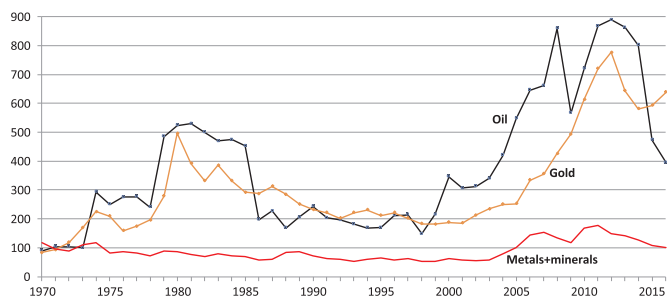


Fig. 1. Real prices\* of oil, gold and metals + minerals 1970–2016. Index, 1970–72 = 100. \*UN's Manufactured Unit Value (MUV) Index in US\$ used as deflator. Sources: UNCTAD, UNSTAT and IMF

## 2. The significance of oil and gold and the market characteristics for the two products

Oil and gold are both of great importance to the world economy, though this importance manifests itself in different ways. Oil is by far the most sizable source of energy use, with applications throughout the modern economy, and its economic weight has been so great that its price changes are believed to affect global growth and inflation. Gold has for millennia played crucial roles in decoration activities while its holdings have been regarded as a safe haven particularly but not exclusively during unruly times. In more recent centuries, gold has additionally been a fundamental factor in global financial and monetary affairs. In terms of quantities and values, oil is much bigger than gold, but they both belong to the top tier among primary commodities in terms of value of production and trade.

Table 1 characterizes some major features of the markets for the two products, and reveals several stark differences between them. Secondary supply plays no role at all in the oil market. In contrast, gold scrap, gold being virtually indestructible, accounts for almost a third of overall supply. Usage is quite concentrated in both materials, with 56% of oil consumption in transport and 53% of gold employed to manufacture jewelry. But while all of oil is irrevocably consumed, more than a third of gold demand in 2016 was set aside for holding by private investors and central banks. As noted above, the economic weight of oil is much greater than that of gold – the 2016 oil supply valued at some

Table 1  
Oil and gold in 2016 – distinguishing characteristics.

Sources: IEA (monthly, annual); Thomson Reuters (annual); World Gold Council (on the web)

	Oil	Gold
<b>Total supply, tons</b>	<b>4850 m</b>	<b>4511</b>
Primary supply	4850 m	3222 Mine
Secondary supply	0	1268 Scrap
		21 Hedging + ETF net
<b>Total demand, tons</b>	<b>4830 m</b>	<b>3559</b>
	2700 m Transport	1891 Jewelry
	870 m Industry	354 Industrial
	390 m Buildings	1057 Private investments (bars & coins)
	290 m Power	257 Central Banks
	580 m Other	
<b>Price, \$/ton</b>	<b>318</b>	<b>40.2 m</b>
<b>Value of supply, \$ bn</b>	<b>1542</b>	<b>181</b>
<b>Value as % of world GDP*</b>	<b>2.06</b>	<b>0.24</b>
*\$75 tr at market prices		
<b>Visible inventories, Dec, tons, total</b>	<b>337 m</b>	<b>99000</b>
	177 m Government	31000 Central banks
	160 m Industry	38000 Bars and coins
		30000 Other
<b>Inventories as % of supply</b>	<b>7</b>	<b>2195</b>

2.06% of global GDP, compared to only 0.24% for gold. Finally, there is a huge difference in inventory holdings, those of oil (7% of supply) representing the need to even out short-run demand (and supply) fluctuations, while in gold, private and official holdings maintained as a safe store of value amount to more than 20 times annual supply. As seen in Table 1, supply of 4511 t in 2016 alone exceeded demand of 3559 t, resulting in a surplus of 952 t in that year. We surmise that the discrepancy, to which neither the World Gold Council nor Thomson Reuters (the two lead agencies producing gold statistics) have been able to provide a full and clear-cut account, implies a further addition to inventories over and above the amounts demanded by private investors (1057 t for bars and coins) and central banks (257 t), mainly in exchange-traded funds (ETF)<sup>2</sup> and in less visible areas like over-the-counter markets and fabrication sites (private communication with World Gold Council and Thomson Reuters).

## 3. The fundamental price determinants for oil and gold

### 3.1. The pricing conventions employed in the two markets

A variety of pricing conventions prevail in primary commodity markets, the dominant ones being posted prices, bilateral contract prices, producer dictated prices, user driven prices, and prices set by auctions and by commodity exchanges – with the latter assuming widening application in international commodity trade (Radetzki and Wårell, 2017). While the conventions used in oil and gold are unlikely to explain the price correlation between the two materials nor their extraordinary price rise since the early 1970s, a proper understanding of how the two markets function warrants a brief description of the conventions used and their evolution over time.

The formation of the Organization of the Petroleum Exporting Countries (OPEC) in 1960, combined with the oil glut through most of that decade and the many nationalizations of the 1970s, enabled the OPEC governments by the mid-1970s to exercise control by establishing a system of producer determined prices. This was centered on a “reference price” set on Saudi Arabia's Light Arabian oil. Other oil qualities produced by OPEC nations were priced with premiums or discounts to this price (Fattouh, 2011). The system of reference prices lasted for almost a decade. Its eventual demise about 1985 was primarily caused by an extraordinary production expansion outside of OPEC, induced by the high prices that prevailed between 1975 and 1985 (Mabro, 2000). Saudi Arabia and the rest of OPEC abandoned the producer administered pricing formula and accepted a more market related system of pricing. At the time, the New York Mercantile Exchange (NYMEX) had already operated a crude oil futures contract for a few years. This trade outlet helped in pricing arm's length sales conducted by the independent producers in non-OPEC countries. Oil prices determined by exchanges have prevailed since that time.

In gold, the shift in pricing conventions has been less dramatic. Shafiee and Topal (2010) report that gold prices were basically flat at about \$20 per ounce from 1833 to 1933, when producer-dictated prices were the dominant convention. Back then, a relatively small number of producers and refiners, and their home governments, had sufficient market power to set prices for extended periods of time. In 1933, the gold price was fixed at approximately \$35 – following an executive order by US President Roosevelt – and remained at that level until 1967. A year later, prices were permitted to deviate from official prices, and in 1975 gold became a new arrival on the commodity exchanges. Since then, gold prices have been basically determined by the forces of supply and demand, just like any commodity prices traded in unregulated and reasonably competitive markets.

<sup>2</sup> The World Gold Council (on the web) defines ETFs as “financial products physically backed with allocated gold bullion, listed on a stock exchange, and bought and sold in the form of shares.”

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