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The financial economics of gold — A survey

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ABSTRACT

We review the literature on gold as an investment. We summarize a wide variety of literature, including the papers in this special issue of International Review of Financial Analysis to which this survey acts as an editorial introduction. We begin with a review of how the gold markets operate, including the underresearched leasing market; we proceed to examine research on physical gold demand and supply, gold mine economics and move onto analyses of gold as an investment. Additional sections provide context on gold market efficiency, the issue of gold market bubbles, gold's relation to inflation and interest rates, and the very nascent literature on the behavioural aspects of gold.

Contents

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1. Introduction

Gold is one of the most malleable, ductile, dense, conductive, non-destructive, brilliant, and beautiful of metals. This unique set of qualities has made it a coveted object for most of human history in almost every civilization, and there have been active gold markets for over 6000 years Green (2007). As money, as an investment, as a store and source of value, hundreds of papers have been written on gold. This review provides a state of the art overview of this voluminous research, and acts as an introduction to this special issue of the International Review of Financial Analysis, while also assisting as a source of reference for future research.

The long and intertwined history of gold, financial markets and money has resulted in gold's regular prominence in investment and monetary discussions. Fig. 1 below shows the number of articles published annually in the Financial Times newspaper about gold between 2004 and 2014 from the FT Interactive Database. The total represents all articles filed under the topic Gold by the Financial Times editors, with the lighter portion showing the number filed under topic: gold as well as having gold in the title. Thus, the number under the topic gold was 401 in 2009 and 212 of those (53%) also had gold in the title.

The volume of academic studies on gold has been growing since it was allowed to float freely in the late 1960s. While gold prices rose after this period, the drivers and mechanics of changes in the price of gold also attracted the attention of academic researchers. The volume of peer-reviewed papers published, depicted below in Fig. 2, shows that the number of published papers has increased significantly in recent years highlighting the relevance of both this special issue and the need for a comprehensive survey of the existing literature.

2. A brief history of gold

Gold is one of the oldest ways to store wealth. In 3000 BC goldsmiths in Sumeria were already working gold into the various forms of jewellery still used today. Excavations at the royal cemetery of Ur (founded about 2500 BC) showed that gold had already become a store of wealth by this time, as well as being utilized as money by traders. Gold has had an impact on the everyday economic activities of ordinary people since at least Egypt in 1400 BC, where it was used as a monetary standard. Perhaps the most famous usage of gold was as money under various gold standards.

Today gold is traded on seven markets including the London OTC market, COMEX (New York), the three Shanghai Exchanges, TOCOM (Tokyo), MCX (India), Dubai and Istanbul. In terms of turnover, the two major markets for gold are the London OTC market and New York (COMEX). Daily volume on the New York Stock Exchange was just over U$34.5 bn per day in 2013. The London Stock Exchange had an average daily trading volume of just over £3.8bn ($5.94bn) in the same year (londonstockexchange.com). In 2013 London net OTC and COMEX daily turnover was U$21bn and U$18bn at average 2013 prices respectively, based on Gold Fields Minerals Services (GFMS) data and author's calculations. Other markets are much smaller and are shown below in Fig. 3. It is estimated that there has been in total 175,000 tonnes of gold mined in history. At average 2013 prices this would value the total stock of gold at just under US$6 trillion. While much of this gold does not circulate as an investment asset, as it is held by central banks in bars or as jewellery by consumers, it remains a sizeable and important financial asset. By comparison, the total market capitalisation of the London Stock Exchange in December 2013 was £4.23 tn (U$6.9 tn) with the New York Stock Exchange being worth just over U$16 tn.

The accidental move of the UK to a gold standard was the genesis of the dominance of the London gold market, which has lasted up until this day. In the 18th century this market absorbed the vast majority of the gold mined in the Brazil gold rush that then went into minting new gold coins; then Russian gold, which was the largest producer before the Californian gold rush of the 1840s. Even the suspension of conversion by the Bank of England in 1931 did not dent London's dominance.

In summary the total available gold stock is similar in value to major stock markets while the turnover of each trading centre shows a similar level of liquidity to major stock exchanges.

Along with the spot and those derivatives markets discussed above, gold can be borrowed in a similar way to normal currencies. See Fig. 4 for details of leasing volume in recent years. There is very little research published on the operations of the leasing markets. Gold itself has an interest rate, the lease rate. Levin and Wright (2006) find that gold prices are negatively related to lease rates. This analysis is based on an arbitrage model developed by Levin, Abhyankar, and Ghosh (1994). Here miners have two options: firstly they can extract gold and sell it in the spot market, using the proceeds to invest in a risk free bond;

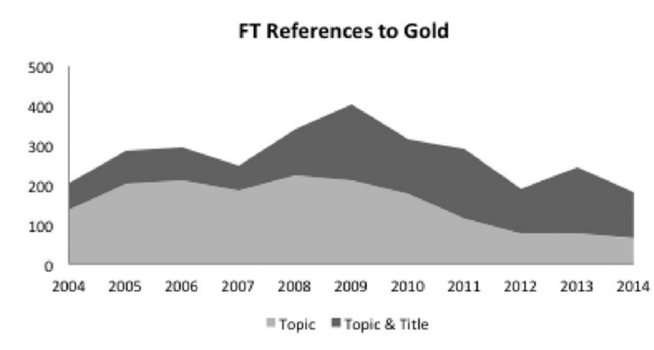

Fig. 1. Gold related articles in the Financial Times. Note: Searches were carried out on FT.com, Author Calculations.

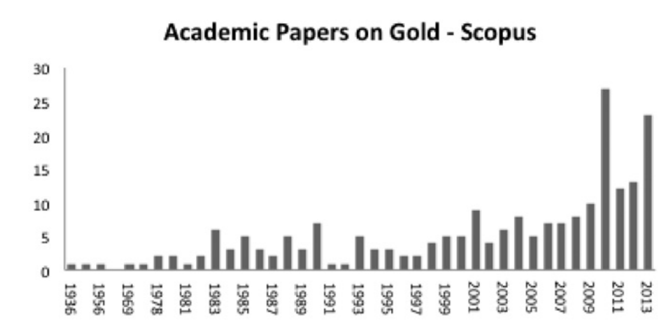

Fig. 2. Published academic papers discussing the financial economics of gold. Source: Author's own calculations, from Scopus.