



From Money to Merely a Precious Metal A Historical Journey of Gold in Muslim World and Gold's Price Correlation with Other Financial Indicators in the Contemporary Financial System

Kamola Bayram
Adam Abdullah

Abstract: For many centuries Islamic coins, such as the *dīnār* (pl. *danānīr*), have attracted the attention of historians and chroniclers. The initial appearance of Islamic coinage came as a response to economic requirements prevailing in the Middle East following the Arab invasion. The motivation behind the inception of Islamic coinage was in absolute harmony with the monetary traditions of the Near Eastern economy. Even though, the external features of the coinage might have been influenced by some socio-political factors, their intrinsic value was determined by the contemporary economic conditions. During periods 1870-1930 the world monetary system was mainly built on gold. However, with the establishment of Bretton Woods System in 1944, the world was set on the new monetary system involving a fixed exchange rate system. With the collapse of the Bretton Woods system in 1971 the price of gold increased to USD 38 per ounce. In April 1974, following the high volatility in monetary markets and oil crisis the price of gold increased 453% and reached USD 172 per ounce. As the U.S. economy increased in power, the I.M.F. diminished the monetary role of gold so that subsequently, gold was viewed as merely a precious metal commodity that was subject to a market value and changes in the price of gold. This article examines the monetary history of gold during Rashidun, Umayyad, Abbasid, Fatimid and Ottoman Caliphates. In particular, this study focuses on golds' performance during global financial crisis of 2007-2009 (GFC) and correlation analysis is conducted to measure the strength and direction of a linear relationship between gold and other selected asset classes as well as financial indicators such as real interest rates, inflation rates, silver price, Dow Jones Industrial Average, Trade Weighted U.S. Dollar Index, money supply and crude oil prices.

Keywords: Gold, *dīnār*, history of the gold *dīnār*, gold price correlation, Bretton Woods System, Safe Haven Asset.

JEL Classification: N15, E421

@ Assoc. Prof., KTO Karatay University, kamolaiium@gmail.com,  0000-0003-2765-5552
Assoc. Prof., Al Qasimia University, aabdullah@alqasimia.ac.ae,  0000-0001-6733-5647

 © Research Center for Islamic Economics
DOI: 10.26414/A3825
TUJISE, x(x), 202x, xx-xx
tujise.org

 Submitted: 28.02.2022
Revised: 29.06.2022
Accepted: 20.07.2022
Online First: .01.09.2022



Introduction

For many centuries Islamic coins, such as the *dīnār* (pl. *danānīr*), have attracted the attention of historians and chroniclers. The initial appearance of Islamic coinage came as a response to economic requirements prevailing in the Near East following the Arab invasion. The motivation behind the inception of Islamic coinage was in absolute harmony with the monetary traditions of Near Eastern economy. Even though, the external features of the coinage might have been influenced by some socio-political factors, their intrinsic value was determined by the contemporary economic conditions (Ehrenkretz, 1992, p. 209).

During the earliest period of Muslim minting production *danānīr* were minted mainly in four regions: Egypt, Syria, North Africa, and Spain. The *danānīr* minted in different regions had different external characteristics and intrinsic features. So as a result, there were several types of *danānīr* in circulation with different standard of fineness. Political and economic changes often led to the issuance of new types of *danānīr* which were usually called by the name of the rulers responsible for such measures (Ehrenkretz, 1992, pp.129-130).

One of the salient features of the monetary system of the medieval caliphate was that it depended on its own mints for coinage supply (Ehrenkretz, 1977).

When Islam started its expansion into Syria and Egypt the Levantine economy was already facing monetary crisis due to the conflicts between Byzantines and Sassanids. The Constantinople dominated local mints were closed. In the aftermath, precious metals unable to be transported back to the capital of Byzantine were stockpiled by public or church authorities (Ehrenkretz, 1977, p.85).

In the early stages of seventh century there were three specific types of “monetary spheres”. First, was the system of Western Europe which was facing decline and practically no gold was left in the region due to the drain of the gold reserves by Levantine merchants who oversaw the luxury imports trade (Lombard, 1975, p.101). The consequences of the loss of gold as currency in Western Europe were lower volume of commercial activity which triggers introduction of silver in multilateral trade (Lombard, 1975, p.101).

The second system was a bimetallic system¹ which existed in the Byzantine Empire. The gold coin of the Byzantine Empire, known as *solidus*, was in circulation as a main currency in Mediterranean trade (Lopez ,1951 p.211) and the third

1 The monetary standard in which the value of the monetary unit is defined as equivalent to certain quantities of two metals, typically gold and silver, creating a fixed rate of exchange between them.

system was monometallic silver system of Sassanid where the major monetary unit was Persian *drachma*. The Sassanids possessed significant amounts of gold, but it was only in possession of sovereigns and nobility (Lombard, 1975, p.103).

Following the Arab conquest, it was necessary to introduce homogeneous monetary system to satisfy equal distribution of money. At that time, the currency mainly consisted of Byzantine *solidus* and the Persian *drachma* which among Arabs was known as *dīnār* and *dirham* (*pl. darahim*). Also there existed other locally minted types.

The conquest of Egypt provided access to gold mines of Nubia², and the only way for Byzantines to restock the gold was via trade, mainly with the Middle East.

During the period 1870-1930 the world monetary system was mainly built on gold. However, with the establishment of the Bretton Woods System in 1944, the world was set on the new monetary system, a fixed exchange rate system, where one ounce of gold was fixed to USD 35. With the collapse of the Bretton Woods system in 1971 the price of gold increased to USD 38 per ounce. In April 1974, following the high volatility in monetary markets and oil crisis the price of gold increased 453% and reached USD 172 per ounce. Traditionally gold has played an important role during times of political and economic turmoil and during equity market crises, when gold responded with higher prices (Koutsotiannis, 1983; Melvin and Sultan, 1990; Cai et al., 2001; Smith, 2002; Lawrence, 2003). Hence, today, gold is seen as a perfect diversifier which can help reserve asset managers reduce the portfolio risk and preserve the wealth. It is routinely used as a long-term inflation hedge by investors. Adding gold into a portfolio can also help to reduce risk in other ways. First, holding 'allocated gold' incurs no credit risk. Therefore, it is a commonly used safe haven asset. Gold has a negative correlation to the U.S. dollar. This makes it an effective hedge against future dollar weakness. A numbers of studies also point to the benefits of the inclusion of gold holdings that leads to a more balanced portfolio (Johnson and Soenen, 1997; Aggarwal and Soenen, 1988; Sherman, 1982; Ciner, 2001; Egan and Peters, 2001; Davidson et al., 2003; Draper et al., 2006).

This article examines the monetary history of gold during Rashidun, Umayyad, Abbasid, Fatimid and Ottoman Caliphates. In particular, this study focuses on golds' performance during global financial crisis of 2007-2009 (GFC) and correlation analysis is conducted to measure the strength and direction of a linear relationship between gold and other selected asset classes as well as financial indicators such as real interest rates, inflation rates, silver price, Dow Jones Industrial Average, Trade Weighted U.S. Dollar Index, money supply and crude oil prices.

2 Nubia was a dependency of the Byzantine Empire.

Monetary History of Gold in Islamic Caliphates

Rashidun Caliphate (632–661)

Verses from the Qur'an (the central religious text of Islam) as well as a number of *ahadith*³ make it perfectly clear that, there was a divine plan to make Mecca the global hub of world commerce.⁴ For this, the first task was to transform the *Ummah* from the age of barter to the age of monetized trade. The Prophet Muhammad (SAW) did this with two *ahadith*. While barter was thus declared as a form of *ribā*, trade with money was approved and encouraged.⁵ To facilitate this, the Prophet Muhammad (SAW) look with favour on Byzantine and Persian coins issued by non-Muslim empires and did not hesitate to use them (Cızakca, 2011).

The first standardization of currency in Muslim world was in 639 (18 AH) under the second caliph of the Rashidun Caliphate, 'Umar ibn Al-Khattab (r.a) who unified the weight of silver currencies which were in circulation in conquered lands (Lombard, 1975, pp.110-111). During his ruling gold currency was based on the *solidus*⁶ and existed three different types of silver currencies which were Persian *dirham bajli*, Byzantine *dirham rumi* and Central Asian *dirham tabori*. The new *dirham* established by 'Umar ibn Al-Khattab (r.a.) was lighter in weight and has Arabic inscriptions instead of Pahlavi. However, the *dirham* of 'Umar ibn Al-Khattab (r.a.) was like its predecessors except of the uniformity of weight and Arabic inscriptions. Whereas the real monetary reform in Muslim world was undertaken by the fourth Rashidun caliph; Ali (r.a.) in 660 (40 AH). He introduced Islamic *dirham* with Kufic inscriptions (Lombard 1975, p.110). However, the attempt was not successful because the new *dirham* was not as compatible as Byzantine and Sassanid coinages.

During that era, gold currency was based on a single unit, the *solidus*. Although, the attempts to do minor changes in *dīnār* were made by the first Umayyad caliph, Mu'awiyah, there were no more efforts until the rule of 'Abd al-Malik ibn Marwan.

3 Plural of *Hadith*, record of the traditions or sayings of the Prophet Muhammad (SAW), revered and received as a major source of religious law and moral guidance, second only to the authority of the Qur'an.

4 Qur'an: 2: 198

5 Malik, Book 31 (Business Transactions), *hadith* 31.12.21; Muslim, Book 10 (Book of Transactions), *Hadith* 3861. These *ahadith* pertain to the exchange of poorer quality of a commodity with a better quality of the same commodity. Since barter is defined as the "direct exchange of goods and services for other goods and services without any medium of exchange for settling payment", these *ahadith* prohibit barter. Thus, barter is not limited merely to exchanging apples for oranges. It also covers exchanging lower quality of dates for better quality ones as explained in the *hadith*. On the definition of barter see; Siklos (2003) "Barter", p.242.

6 *Solidus* (Latin); *Nomisma* (Greek) is a Byzantine gold coin introduced in the fourth century and used as main currency in Mediterranean commerce.

Umayyad Caliphate (661–750)

The fifth caliph of Umayyad Caliphate 'Abd al-Malik ibn Marwan who for the first time introduced the special currency of the Muslim world and made it the only currency of exchange. The first attempt of 'Abd al-Malik ibn Marwan to introduce an Islamic currency was in 691/692. The coin was called *dīnār* and was the first coin carry Arabic inscription. It was similar to Byzantine solidus in terms of size and weight. The Byzantine emperor Justinian II refused to accept the new gold currency and struck a new *solidus* as a response. In 693 'Abd al-Malik ibn Marwan issued a new *dīnār* with the figure of caliph and testimony of Islam. The response of Byzantine emperor was again striking new coins similar to the ibn Marwan's. In 697 ibn Marwan abandoned all traces of iconography and introduced the first coin devoid of figurative representation. The decree on making the new *dīnār* the only currency to be used in Umayyad lands followed its introduction. Old coins were to be sent to the treasury and those who disobey faced the death penalty (Ali, 2004). The new *dīnār* weighed less than *solidus* which according to Gresham's law⁷ helped to displace the *solidus*. *Fuqaha* (Muslim jurists) established the legal exchange rate as 10 *darahim* equals to one *dīnār* following 'Umar ibn Al-Khattab (r.a.) (Ehrenkreutz, 1959 p.132). Centralization of gold issuance and the devaluation of *dirham* was during the 10th Umayyad caliph Hisham ibn Abd al-Malik (724-743/105-125 AH). During his reign *dirham* was standardized so that ten *darahim* were equivalent to seven *mithkals*⁸. Also, all coinage, except those minted in the city of Wasit, where the mint was established, were withdrawn from circulation.

Abbasid Caliphate (750–1258)

The first time the inspection of mint and the appearance of the mint supervisor's name on the coinage started during reign of the fifth caliph of Abbasid Caliphate, Harun al-Rashid (786-809/170-193 AH) (Ehrenkreutz, 1959, p.141). Meanwhile the indication of location on the coinage started during the reign of seventh Caliph of Abbasid Caliphate, al-Ma'mun (813-833/198-218 AH). But in 827 (212 AH) minting of gold coinage was decentralised so that minting would proceed in all of the major towns.

7 Gresham's law is a monetary principle stating that "bad money drives out good." It is primarily used for consideration and application in currency markets. Gresham's law was originally based on the composition of minted coins and the value of the precious metals used in them.

8 The *mithkals* is an Arabic unit of weight used in Iran, mostly for weighing gold and Saffron. It is equivalent to a little over 4.6 grams.

Through the ninth to the eleventh centuries the 'Abbasid *dīnār* and also gold coinage of Byzantine weakened in value. The fineness of Abbasid *dīnār* during the reign of Buwayhids (946-1055/ 335-447 AH) dropped to less than 50 per cent (Ehrenkreutz, 1956, p.180). In fact, during that period the entire issuance of gold coinage experienced low quality since the gold mines and trading routes of gold had collapsed into hands of hostile forces.

In 868 (254 AH), Egyptian coinage for the first time was liberalized from the central control of Abbasids by Aḥmad ibn Ṭulūn, the founder of Ṭulūnid Dynasty, which ruled Egypt and Syria during ninth century. In 871 (258 AH), Aḥmad ibn Ṭulūn gained control over the Sudanese gold supply as the consequence of his control over the finances of Egypt and assertion of independence from Baghdad, and in 879 (266 AH) started to mint the highly valued (98 percent fineness) Aḥmadi *dīnār*.

During the reign of Aḥmad ibn Ṭulūn only three minting locations existed, although during the reign of his successor Khumarawayh mints increased in number (Grabar, 1954).

In the middle of the ninth century the majority of gold supplies were controlled by the Abbasid Empire in Egypt and North Africa. The significant increase in supply into those lands resulted in decline of purchasing power of *dīnār*. However, this decline in purchasing power caused economic expansion via an increase in investment. Thusly, the powerful Egyptian economy helped the Fatimid rulers, who arose in Maghreb in the 10th century to build a new regime which resulted in fundamental changes in Muslim world.

Fatimid Caliphate (909–1171)

Under the reign of Fatimid Caliphate (909-1171/303-565 AH), Egypt became the hub for capital flows and commercial life which made it the richest country in the Muslim world. Prior to the conquest of Fatimids, the gold coin in circulation in Egypt was *dīnār radi* minted during the reign of Abbasids Caliph al-Radi.

The Mamluks gained control of Egypt and Syria in 1250/648 AH, replacing the dynasty of the Ayyubids, and continued until 1382/784 AH when Circassian Mamluks (military slaves brought from Caucasus) replaced the Mamluk sultanate. The dynasty of Circassian Mamluks lasted until 1517/922 AH when Egypt and Syria were conquered by the Ottoman Empire (Allouche, 1994, p.1).

During the reign of the Mamluks (1468-1517/872-922 AH) there was a decrease in the fineness of *danānīr* and *darahim*, which resulted in negative outcomes in the

economy. Contemporary historians stated that shortcomings in monetary policy resulted in hardships and collapse of the country (Allouche, 1994, p.3). Therefore, the monetary system during reign of Mamluk's can be described as 'frequent disorder'.

The biggest reason underlying the financial problems in the Mamluk Caliphate was lack of a consistent monetary standard, since coinage minted during the reign of different Sultans were diverse in weight and degree of purity. One of the main reasons of alteration and debase of coinage was the increasing financial needs of the government which must cover various expenses including the spending on excessive tastes and requirements of the imperial court households of great *amirs* (Ayalon, 1958, p.56).

At the end of Mamluk's sultanate the weight of *dinār* was 3.20 grams and the gold content reduced to the ninety-five per cent (Bacharach, 1973, p.83).

Ottoman Caliphate (1517–1924)

In 1326/727 AH the first silver coin of the Ottoman Empire, the *akce*, was minted mainly in Bursa and Edirne, during the rule of Orhan Gazi and remained the main unit of account until the late 17th century when it was replaced by *kurus*⁹. The purchasing power of *akce* was determined by its silver content. *Akce* had become the main monetary unit of Western and Central Anatolia, and the Southern Balkans (Pamuk, 2000).

Ottoman Laws required all bullion, either produced or imported, be brought to the mints.

Even though, the *akce* was the main currency during that time, gold coins, mainly those of other states, were extensively used for larger transactions, saving and credit.

The growing availability of bullion and increasing monetary needs of the Ottoman Empire's economy set the environment for striking gold coins. So, in 1447 (882 AH) during the reign of Sultan Mehmet II (*Fatih* – the Conqueror), the first gold coins of the Ottoman Empire, called *sultani* or *hasene* were minted, so that the Ottomans shifted from a monometallic system based on silver to a bimetallic system based on silver and gold. In fineness, the *sultani* was superior to their peers used in Europe known, such as the *ducat*. Notwithstanding minor changes in the

9 The *kurus* silver coin was introduced in 1688 in the Ottoman Empire.

16th century, the fineness and weight of the *sultanis* remained largely untouched and exchanged at par against the *ducat* until the end of the 17th century (Pamuk, 2000). The main reason of introducing *sultanis* was the desire of Ottomans to expand beyond the Empire and conquer marine and land trading routes. This form of multinational trade required a strong monetary foundation, however, the circulation of other gold coins was also allowed.

After the conquest of Egypt, in sixteenth century, the Ottomans obtained access to ample supplies of gold from Egypt and Sudan. Also, tax revenues from Egypt were collected in gold coins of Egypt known as *şerifis*¹⁰ (Pamuk, 2000).

The Ottoman gold coins mainly were used by rich merchants and bureaucrats retained the characteristics of gold as a store of value and other monetary aspects. But as conquests continued and the Empire increased, it was difficult to sustain the monetary unity and therefore, some local currencies were used along-side the gold *sultanis*. In fact, the usage of gold and silver coins of other countries was encouraged with objective to build up gold and silver stocks to increase trade and commerce.

In the 19th century, the most important development in monetary system of Muslim world was the establishment of unity among gold and silver coinage and decision to forgo adulteration. However, the abandonment of adulteration was costly for all concerned. So that, the Ottomans inevitably resorted to external borrowings in order to provide needed income to balance the budget deficit, but this practice ultimately led to their own downfall (Pamuk, 2000).

The Role of Gold in Contemporary World

During the period 1870-1930, the world monetary system was mainly built on gold. However, with the establishment of Bretton Woods System in 1944, the world was set on the new monetary system, involving a fixed exchange rate system. After the collapse of the Bretton Woods system in 1971, when exchange rates were fixed, countries moved towards floating exchange rates and the expectation was that the requirement for foreign reserves would decrease. On the contrary, central banks currently hold even more foreign exchange reserves, mainly with objective to enhance the credibility of their exchange rate policy. To be a credible medium of exchange, a measure of value and a standard of deferred payment, a currency must retain its store of value function and preserve its purchasing power (Abdullah, 2013). If money is a good store of value, then its purchasing power should be

10 *Sherifis* substituted the *ashrafis* of Mamluk's.

preserved from the time money is received until it is spent (Meera and Larbani, 2009). However, in the contemporary financial system, money is not a good store of value, since its value generally depreciates over time, i.e., its purchasing power erodes due to inflation (Meera and Larbani, 2009).

Starting from the demise of the Bretton Woods system, the U.S. dollar substantially lost its value, in such a way that, in 1971 the price of one ounce of gold was USD 35, whereas currently (as at 19 April 2022) the price of one ounce of gold is USD 1,978. Accordingly, the value of one dollar in 1971 has fallen to two (2) cents in 2022 ($=35/1,978$), which reveals a catastrophic collapse in the store of value function of money, during half-century (51 years) period of the fiat monetary standard.

Gold, which was the main reserve asset prior the collapse of the Bretton Woods system gained in popularity as a reserve asset again following the Global Financial Crisis of 2008 (GFC), given gold's characteristics of a safe haven asset and a reliable store of value. It is noted that some assets, which are known as *hedge assets*, may have an outstanding performance during normal times. On the other hand, the assets which outperform the market during the times of financial or geopolitical turmoil and uncertainty are known as *safe haven assets*. Safe haven assets may not be as much attractive as hedge assets during times of stability, despite these portfolio managers should allocate into the safe haven assets to preserve the value of their portfolios during times of crisis.

Gold is the only precious metal accepted as a reserve asset. Gold is negatively correlated with other financial assets held in central bank portfolios, since it is no one's liability and therefore has zero credit risk (WGC 2010; Tuley and Lucey, 2006; Aizenman et al., 2015). Gold's negative correlation with the U.S. dollar is in fact one of gold's qualities that many portfolio managers consider particularly attractive as a reserve asset, since it can serve as a hedge against dollar assets. Yet it is remarkable that only a few European countries and the U.S. official gold holdings constitute more than 50% of total reserves. In the rest of the world, especially in emerging market economies, this figure varies from 3 to 5%. This current under-allocation to gold, reflects a significant phenomenon for emerging market central bankers and should serve to encourage them to increase their gold holdings (Bhatia, 2012).

Bayram et al. (2018) studied the reserve nature of selected countries namely Turkey, Malaysia, Saudi Arabia, and Pakistan by adopting the Black-Litterman model to build a new strategic portfolio for an optimal allocation to gold. According to the results all countries under the analysis are suggested to increase their gold holdings to preserve the value of the portfolio during times of financial turmoil given the outstanding performance of gold during the GFC.

General Trend of Gold Prices

During the period 1870-1930 the world monetary system was mainly built on gold. However, with the establishment of Bretton Woods System in 1944, the world adopted a new monetary system, based on a fixed exchange rate system, where one ounce of gold was fixed to USD 35.

With the collapse of the Bretton Woods system in 1971 the price of gold increased to USD 38 per ounce. In April 1974, following the high volatility in monetary markets and oil crisis the price of gold increased 453% and reached USD 172 per ounce.

As the U.S. economy increased in power, the I.M.F. diminished the monetary role of gold so that subsequently, gold was viewed as merely a precious metal commodity subject to a market value and changes in the price of gold.

With the decision of I.M.F. to sell the 1/6 of gold in its possession, in 1975, the price on gold dropped to USD 109 per once by August 1976 (Alic, 1985).

However, gold prices experienced another wave of increases in late 1970's and early 1980's. The phenomenon was driven by the expectations of the return to gold standard and the instability of the monetary system. During this period, the price of gold increased up to USD 677 per ounce. However, the effect was short term and gold prices entered a declining trend starting from 1981 (Yıldırım, 1991).

In the 1980's there were short-term fluctuations of gold prices due to economic and political turmoil. Iran-Iraq war in 1980's and Gulf Crisis in 1990's resulted in short term increases in gold prices. However, gold's attractiveness as financial asset declined, due to financialization and the rapid development of financial markets in 1980's and 1990's.

Starting from the year 2000, the gold prices once again entered an increasing trend. The reason of the price increase was mainly geopolitical instability such as the 9/11 terrorist attack on the World Trade Centre in the U.S. in 2001, the 2003 Iraq war, turmoil in Middle East and financial uncertainty.

Global Financial Crisis and Gold Prices

The demand on gold tends to increase during the times of economic or political turmoil. Since gold prices are inversely correlated with returns on other financial assets. Including an asset which has a negative correlation with the rest of the assets in the portfolio helps to decrease the overall volatility of the portfolio (Çıtak, 2006). Figure 1 illustrates the financial performance of gold during the GFC.

The GFC started in July 2007 in the U.S., due to the mortgage crisis and subsequently spread globally. Bear Stern, U.S. based investment bank, was one of the first victims of the GFC and on 17 March 2008, announcing that they faced financial difficulties. Immediately, following the news, the price of gold achieved a record high and increased to USD 1,011 per ounce. On 15 July 2008 the price of gold increased to USD 986 per ounce driven by the announcement of bailout plan of two giant mortgage institutions, Fannie Mae and Freddie Mac by the Federal Reserve and U.S. Treasury. Over the following two months, the price of gold reduced to USD 740 per ounce and again increased to USD 905 per ounce following the 700 billion rescue plan by the U.S. House of Representatives. After the short period of price reduction, the price of gold increased to USD 903 per ounce on 8 October 2008, following the interest rate reduction by central banks of the U.S., the E.U., the U.K., Sweden, Switzerland, Canada and China (WGC, 2010).

Figure 1
Gold Price Performance (2007-2008)

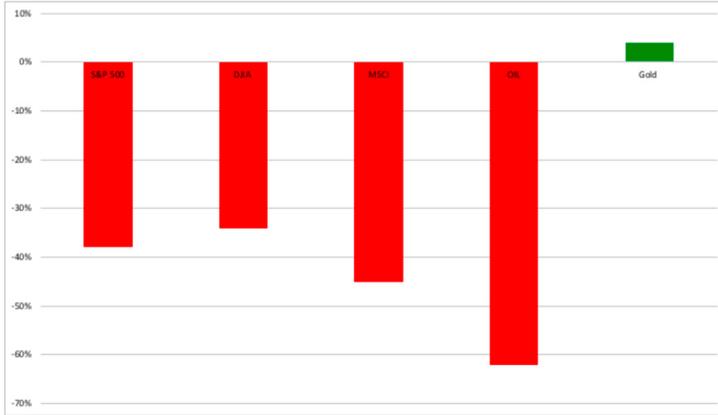


Source: Bloomberg

Figure 2 demonstrates the financial performance of some selected financial assets for the period 2007-2008. In this highly volatile period the returns on S&P, DJIA, MSCI and crude oil were negative and dropped 38%, 34%, 45% and 62% consequently. Whereas the price of gold increased 4%.

Figure 2

Financial Performance of Selected Assets (2007-2008)



Source: Bloomberg

In 2009, financial markets started to recover, however, the price of gold continued its upper trend and reached an all-time high of USD 1,127 per ounce in November 2009. This phenomenon could be linked to the weakened USD. During the period 2008-2009, the USD depreciated 8% against other currencies.

Methodology

Correlation analysis is conducted to measure the strength and direction of a linear relationship between the two variables on a scatterplot. The correlation coefficient is denoted by r and takes values between -1 and +1. Table 1 explains the interpretation of different values of r .

Table 1

Interpretation of Different Values of Correlation Coefficient (R)

R	Type of Relationship
-1	A perfect negative linear relationship
-0.70	A strong negative linear relationship
-0.50	A moderate negative linear relationship
-0.30	A weak negative linear relationship
0	No linear relationship
+0.30	A weak positive linear relationship
+0.50	A moderate positive linear relationship
+70	A strong positive relationship
+1	A perfect positive relationship

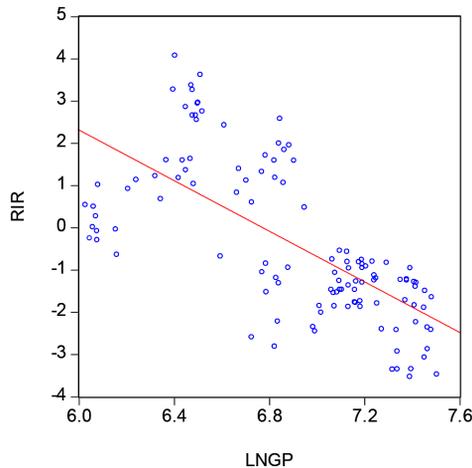
To achieve this objective nine variables have been employed. The dependant variable is price of gold (GP); independent variables are real interest rates (RIR), inflation rates (Consumer Price Index (CPI)), silver price (SP), Dow Jones Industrial Average (DJIA), Trade Weighted U.S. Dollar Index (USD Index), money supply (M2) and crude oil prices (OP). The independent variables are the major economic factors that influence the GP.

Results

Figures 3, 4, 5, 6, 7, 8 and 9 illustrate the scatter plots of correlation of natural logarithm of gold prices with real interest rates, inflation rates, natural logarithm of Dow Jones Industrial Average, natural logarithm crude oil prices, natural logarithm of silver prices, natural logarithm of M2 money supply (M) and natural logarithm of USA dollar trade weighted index respectively.

Figure 3

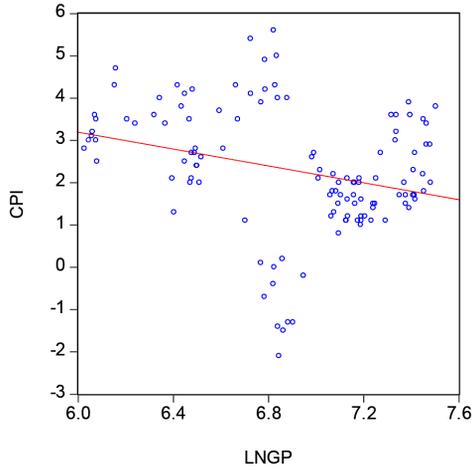
Correlation of Real Interest Rates and Natural Logarithm of Gold Prices



Source: Bloomberg, Author's calculations.

Figure 4

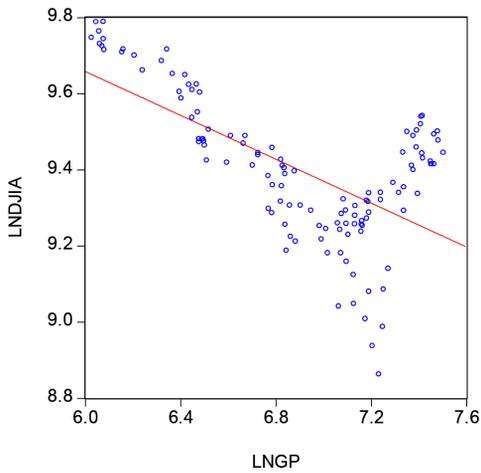
Correlation of Inflation Rates with Natural Logarithm of Gold Prices



Source: Bloomberg, Author's calculations.

Figure 5

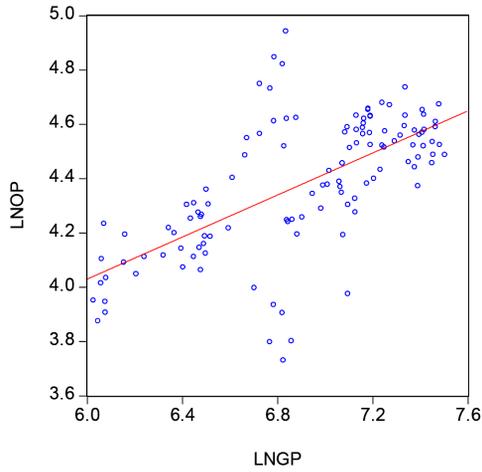
Correlation of DJIA with Natural Logarithm of Gold Prices



Source: Bloomberg, Author's calculations.

Figure 6

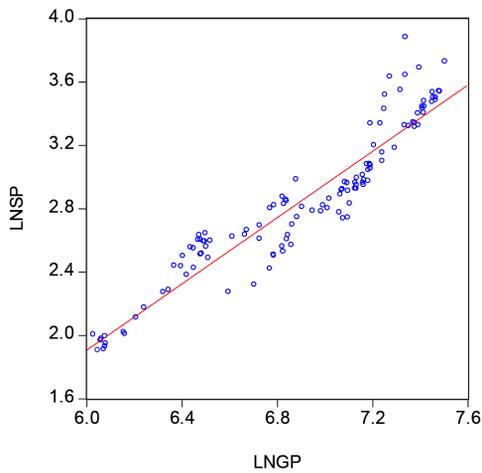
Correlation of Crude Oil Prices with Natural Logarithm of Gold Prices



Source: Bloomberg, Author's calculations.

Figure 7

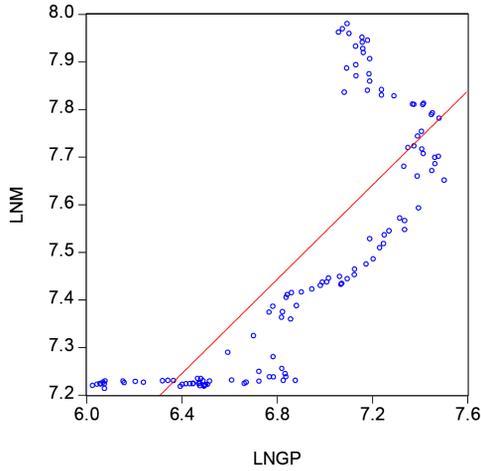
Correlation of Natural Logarithm of Silver Prices with Natural Logarithm of Gold Prices



Source: Bloomberg, Author's calculations.

Figure 8

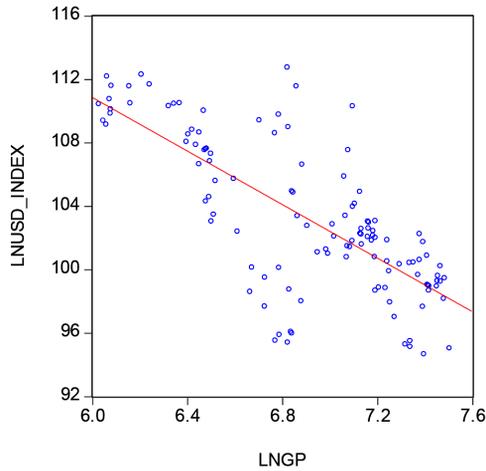
Correlation of M2 Money Supply (M) with Gold Prices



Source: Bloomberg, Author's calculations.

Figure 9

Correlation of USA Dollar Trade Weighted Index with Gold Prices



Source: Bloomberg, Author's calculations.

Table 2

The Correlation Coefficients Between the Variables Under the Analysis.

	LNG	RIR	CPI	LNDJIA	LNOP	LNSP	LNM	LNUSD INDEX
LNG	1	-0.687	-0.285	-0.634	0.650	0.941	0.792	-0.737
RIR	-0.687	1	-0.255	0.327	-0.656	-0.648	-0.590	0.663
CPI	-0.285	-0.255	1	0.501	0.269	-0.123	-0.356	-0.159
LNDJIA	-0.634	0.327	0.501	1	-0.357	-0.533	-0.427	0.481
LNOP	0.650	-0.656	0.269	-0.357	1	0.699	0.484	-0.853
LNSP	0.941	-0.648	-0.123	-0.533	0.699	1	0.655	-0.812
LNM	0.792	-0.590	-0.356	-0.427	0.484	0.655	1	-0.381
LNUSD INDEX	-0.737	0.663	-0.159	0.481	-0.853	-0.812	-0.381	1

According to the scatter plots and correlation table, a strong positive correlation exists between oil prices, silver prices and money supply (M2), which equals to 0.650, 0.941 and 0.792 respectively. This implies that these asset groups tend to move together so that increase in money supply for example will lead to higher gold prices. On the other hand, commodities such as oil and silver also tend to move in the same direction. A higher correlation coefficient indicates a higher tendency of price co-movement. For example, an increase in the price of gold will lead to higher oil prices, however the correlation coefficient is weaker (=0.650) compared to the correlation coefficient of gold and silver prices, which is 0.941 and indicates an almost perfect positive relationship between gold and silver prices.

On the other hand, variables such as, real interest rates, Dow Jones Industrial Average and USA Dollar Trade Weighted Index have a strong negative correlation with gold prices, -0.687, -0.634 and -0.737 respectively. The negative relationship between gold prices and real interest rates implies that higher interest rates associated with higher opportunity cost of holding assets, like precious metals, which do not provide interest and makes investment in precious metals, such as gold, less attractive to the investor. Gold price tends to increase significantly only during the periods of negative real interest rates. During times of negative real interest rates creditors are losing money, therefore, they are more prone to buy gold as gold has a traditional role as money and a store of wealth. Gold helps to preserve the purchasing power of capital.

Finally, there is a weak negative correlation between inflation rates and gold prices (= -0.285). The relationship between inflation rates and gold prices

is positive. This is justified by the tendency of gold prices to increase in tandem with inflation (Dempster and Artigas, 2010). Especially, in times of economic turbulence, when inflation cannot be controlled, the cost-of-living increases, so that investors prefer to hold gold as a store of value.

Conclusion

This article examines gold's monetary history throughout the Rashidun, Umayyad, Abbasid, Fatimid, and the Ottoman Caliphates. We also studied its performance during the GFC and finally correlation analysis was conducted to measure the strength and direction of a linear relationship between gold and other selected asset classes as well as financial indicators.

The first standardization of money in the Muslim world occurred in 639, when 'Umar ibn Al-Khattab (r.a), the second caliph of the Rashidun Caliphate, harmonized the weight of silver currencies in circulation in conquered territories. During his reign, gold was based on the *solidus*, while silver was divided into three types: the Persian *dirham bajli*, Byzantine *dirham rumi*, and Central Asian *dirham tabori*. Although the first Umayyad caliph, Mu'awiyah, attempted to make small adjustments in *dīnār*, there were no further attempts until the reign of 'Abd al-Malik ibn Marwan. 'Abd al-Malik ibn Marwan, the fifth caliph of the Umayyad Caliphate, was the first to introduce the Muslim world's specific currency and make it the only medium of commerce. The Abbasid Empire in Egypt and North Africa controlled the majority of gold supply in the middle of the ninth century. The massive increase in supply into those lands resulted in a decrease in *dīnār*'s purchase power.

However, this drop in purchase power resulted in a rise in investment, which resulted in economic expansion. As a result, the powerful Egyptian economy aided the Fatimid caliphs in the Maghreb in the 10th century to establish a new government, which resulted in significant changes in the Muslim world. The quality of *danānīr* and *darahim* decreased under the rule of the Mamluks (1468-1517), which resulted in negative outcomes on the economy. According to modern historians, the country's monetary policy failures culminated in suffering and economic collapse. As a result, the monetary system during Mamluk rule reflected "frequent chaos". The lack of a consistent monetary standard was the primary cause of the Mamluk Caliphate's financial woes. Subsequently, currency produced under the reigns of several Sultans varied in weight and purity. The rising financial demands of the government, which had to pay different costs including spending on extravagant preferences and wants of the imperial court families of great *amirs*, was one of the primary causes for the modification and debasement of currency.

The first gold coins of the Ottoman Empire, known as *sultani* or *hasene*, were struck in 1447 under the reign of Sultan Mehmet II. As a result, the monometallic system based on silver was replaced with a bimetallic system based on silver and gold. The major motivation for creating *sultanis* was the Ottoman's desire to expand outside the Empire and capture sea and land trade routes. Following the conquest of Egypt in the sixteenth century, the Ottomans had access to abundant gold resources from Egypt and Sudan. The formation of uniformity among gold and silver coins, as well as the determination to avoid adulteration, were the most significant developments in the Muslim world's monetary system in the nineteenth century. However, all concerned paid a high price for abandoning adulteration. As a result, the Ottomans inevitably resorted to external borrowings to generate needed revenue in order to cover the budget deficit, which led to their downfall.

During the period 1870-1930 the global monetary system was mainly built on gold. However, with the establishment of Bretton Woods System in 1944, the world was set on the new monetary system, based on a fixed exchange rate system, where one ounce of gold was fixed to USD 35. With the collapse of the Bretton Woods system in 1971 the price of gold increased to USD 38 per ounce. In April 1974, following the high volatility in monetary markets and oil crisis the price of gold increased 453% and reached USD 172 per ounce. As the U.S. economy increased in power, the I.M.F. diminished the monetary role of gold so that subsequently, gold was viewed as merely a precious metal commodity that is subject to a market value and changes in the price of gold.

To understand the main factors which effects gold prices today, we conducted a correlation analysis between gold prices and main financial indicators. Our findings suggest that the correlation between gold prices and money supply is positive. The highest correlation exists between the gold price and silver price (= 0.941). The relationship between DJIA and gold prices is negative. This explained with the 'safe haven' features of gold. Recall, that haven asset is an asset which outperforms the market during times of financial turmoil.

The relationship between gold prices and real interest rates is negative. The intuition behind this is that higher interest rates associated with higher opportunity cost of holding assets, like precious metals, which do not provide interest and makes investment in precious metals, such as gold, less attractive to the investor. Gold price tends to increase significantly only during the periods of negative real interest rates. During times of negative real interest rates creditors are losing money, therefore, they are more prone to buy gold, as gold has a traditional role as money and a store of wealth, since gold helps to preserve the purchasing power of the capital.

References

- Abdullah, A. (2013). The gibson paradox: Real gold, interest rates and prices. *International Business Research*, 6(4), 32-44.
- Aggarwal, R. & Soenen, L. (1988). The nature and efficiency of the gold market. *Journal of Portfolio Management*, 14, 18-21.
- Ali, W. (2004). *Islamic coins during the Umayyad, Abbasid, Andalusian and Fatimid dynasties*. Manchester: FSTC. Available at: <http://www.muslimheritage.com/uploads/Islamic%20Coins.pdf>.
- Alıç, A. (1985). *Dünyada ve Türkiye'de altın* (Research report, No.268). Maliye ve Gümrük Bakanlığı Araştırma, Planlama ve Koordinasyon Kurulu (Republic of Türkiye Ministry of Finance and Customs Research, Planning and Coordination Board).
- Allouche, A. (1994). Mamluk economics, a study and translation of al-Maqrizis ighathah: Kitab ighathat al-ummah bi-kashf al-ghummah. In Adel, A., Muhammad, M.Z. and Jamal al-Din, M.S. (Eds), *Lajnat al-ta'lif wa'l-tarjama wa'l-nashr* 1940 (2/e 1957), Salt Lake City: University of Utah Press.
- Ayalon, D. (1958). The system of payment in Mamluk military society. *Journal of the Economic and Social History of the Orient*, 1. 37-65.
- Bacharach, J. L. (1973). The dinār versus Ducat. *International Journal of Middle East Studies*, 4. 77-96.
- Baur, D. and Lucey, B.M. (2009). Flights and contagion – An empirical analyses of stock-bond correlations. *Journal of Financial Stability*, 5(4), 339-352.
- Baur, D. and McDermott, T. (2010). Is gold a safe haven? International evidence. *Journal of Banking and Finance*, 34(8), 1886-1898.
- Bayram, K., Abdullah, A., and Meera, A.K. (2018). Identifying the optimal level of gold as a reserve asset using Black-Litterman model: The case for Malaysia, Turkey, KSA and Pakistan. *International Journal of Islamic and Middle Eastern Finance and Management*, 11(3), pp.334-356, <https://doi.org/10.1108/IMEFM-06-2017-0142>
- Berkelaar, A., Coche, J., and Nyholm, K. (2010). *Central bank reserves and sovereign wealth management*. Basingstoke: Palgrave Macmillan.
- Bhatia, A. (2012). Optimal gold allocation for emerging-market central banks. In *RBS Reserve Management Trends*. Central Banking Publications.
- Borio, G., Galati, G., and Heath, A. (2008). *FX reserve management: trends and challenges* (BIS Papers No. 40). Retrieved from <https://www.bis.org/publ/bppdf/bispap40.pdf>
- Capie, F., Mills, T. C., and Wood, G. (2005). Gold as a hedge against the dollar. *Journal of International Financial Markets, Institutions and Money*, 15(4), 339-352.
- Ciner, C. (2001). On the long run relationship between gold and silver: A note. *Global Finance Journal*, 12(2), 299-303.
- Cıtak, S. (2006). *Altın (24 ayarın hikayesi)*. Istanbul: Destek Publishing

- Cızakca, M. (2011). Public Lecture Jan 17, 2011. Kuala Lumpur
- Davidson, S., Faff, R., and Hiller, D. (2003). Gold factor exposures in international asset pricing. *Journal of International Financial Markets, Institutions and Money*. 13(3), 271-289.
- Davidson, S., Faff, R., and Hiller, D. (2003). Gold factor exposures in international asset pricing. *Journal of International Financial Markets, Institutions and Money*. 13(3), 271-289.
- Dempster, N. and Artigas, J.C. (2010). Gold: Inflation hedge and long-term strategic asset. *The Journal of Wealth Management*, 13(12), 69-75.
- Draper, P., Faff, R.W., and Hiller, D. (2006). Do precious metals shine? An investment perspective. *Financial Analysts Journal*, 62(2), 98-106.
- Egan, P. and Peters, C. (2001). The performance of defensive investments. *Journal of Alternative Investments*, 4, 49-56.
- Ehrenkreutz A.S. (1956). The crisis of dinār in the Egypt of Saladin. *Journal of the American Oriental Society*. 76, 178-184.
- Ehrenkreutz A.S. (1959). Studies in the monetary history of the Near East in the Middle Ages: I, The standard of fineness of some types of dinārs. *Journal of the Economic and Social History of the Orient*. 2, 128-161.
- Ehrenkreutz A.S. (1977). Money. In B. Spuler, et al. (eds.). *Handbuch der Orientalistik*. Leiden: E. J. Brill.
- Ehrenkreutz A.S. (1992). *Monetary change and Economic History in the Medieval Muslim World*. Variorum.
- Ehrenkreutz, A.S. (1954). Contributions to the knowledge of the fiscal administration of Egypt in the Middle Ages. *Bulletin of the School of Oriental and African Studies (BSOAS)*, 16(3) 502-5014.
- Grabar, O. (1954). *The coinage of Tūlūnids. numismatic notes and monographs*, (No.139), 1-78.
- Hagemann, H. A. (1969). Reserve policies of central banks and their implications for U.S. balance of payments policy. *The American Economic Review*, 59, 62-71.
- Ibrahim, M. (2012). Financial market risk and gold investment in an emerging market: the case of Malaysia. *International Journal of Islamic and Middle Eastern Finance and Management*, 5(1), 25 – 34.
- IMF (2001). *Guidelines for foreign exchange reserve management*. Washington: International Monetary Fund.
- IMF (2004). *Guidelines for foreign exchange reserve management*. Washington: International Monetary Fund.
- Jaffe, J. (1989). Gold and gold stocks as investment for institutional portfolios. *Financial Analysts Journal* 45. 53-59.
- Johnson, R. and Soenen, L. (1997). Gold as an investment asset—perspectives from different countries. *Journal of Investing*, 6, 94-99.

- Kadi, Wadad and Shahin, Aram A. (2013). Caliph, caliphate. *The Princeton Encyclopedia of Islamic Political Thought*, 81–86.
- Kenen, P. B. (1960). International liquidity and the balance of payments of a reserve currency country. *Quarterly Journal of Economics*, 572-586.
- Kenen, P.B. (1963). Reserve asset preference of central banks and stability of the gold-exchange standard, *Princeton Studies on International Finance*, 10. 1-95.
- Koutsoyiannis, A. (1983). A short-run pricing model of a speculative asset tested with data from the gold bullion market, *Journal of Applied Economics* 15. 563–582.
- Lombard, M. (1975). *The golden age of Islam*. Amsterdam: North-Holland Publishing Co.
- Lopez, R. S. (1951). The dollar of the Middle Ages. *The Journal of Economic History*. XI(3), 209-234.
- Lucey, B.M., Poti, V. and Tully, E (2006). International portfolio formation, skewness and the role of gold. *Frontiers in Finance and Economics* 3(1), 1–17.
- Makin, J. (1971). Swaps and roosa bonds as an index of the cost of cooperation in the 'Crisis' Zone. *Quarterly Journal of Economics*, 349-356.
- McCown, J. R. and Zimmerman, J. R. (2006). *Is gold a zero-beta asset? Analysis of the Investment Potential of Precious Metals*. Available at SSRN: <http://ssrn.com/abstract=920496orhttp://dx.doi.org/10.2139/ssrn.920496>
- Meera, A.K. M. and Larbani, M. (2009). Ownership effects of fractional reserve banking: an Islamic perspective. *Humanomics* 22(1), 101-116.
- Mylchreest, P. (2007). *Gold war* (Redburn Research, November 12). Retrieved from http://www.gata.org/files/RedburnPartnersGoldReport_11-12-2007.pdf
- Mylchreest, P. (2016). *Death of the gold market: Reforming the LBMA and the true price of physical gold. Equity & cross asset strategy* (4 May 2016). Retrieved from <http://www.gata.org/files/MylchreestReport-05-2016.pdf>
- Nugee, J. (2000). *Foreign exchange reserve management* (Handbooks in Central Banking No.19). Centre for Central Banking Studies, Bank of England.
- Pamuk, S. (2000). *A monetary history of the Ottoman Empire*. Cambridge: Cambridge University Press.
- Sherman, E. (1982). Gold: A conservative, prudent diversifier. *Journal of Portfolio Management*, 8(3), 21-27.
- Stekler, L. and Piekarz, R. (1970). Reserve asset compositions for major central banks, *Oxford Economic Papers*, 260-274.
- WGC (2010). *The evolution in central bank attitudes toward gold*. World Gold Council
- Yıldırım, D. S. (1991). *Uluslararası altın piyasaları ve Türkiye’de altın borsası, sermaye piyasası kurulu*.