

Construction of an Optimum Currency Area Index Anchored to the Gold Dinar: The Case of Selected Islamic Countries

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ABSTRACT

This paper constructs an optimum currency area (OCA) index by using the gold price as a nominal anchor and substitute for the US \$. The use of gold Dinar is in line with the spirit for implementing Sunnah money (gold Dinar). The method used for estimating the OCA-gold Index is the standard deviation (SD) of gold price variability. The five Islamic countries selected as the units of observation are listed among the top ten gold consumer countries worldwide. The findings of this paper may help us to understand how powerful gold can be as a benchmark or convergence criterion for a cycle co-movement measure of symmetry shock within the Islamic nations in comparison to the US \$. As most of the OCA's conventional index have adopted fiat money (\$ and Euro) as an anchor, this study offers an alternative model that employs the use of commodity money as the benchmark.

Keywords: Optimum Currency Area, Gold Dinar, Islamic Nation, Anchor Currency

JEL Classifications: E42, F36, F33

1. INTRODUCTION

Islamic nations have been enthusiastically promoting a currency union since 1945, but the proposals fracture into two targets. One, the Middle East block targets a single currency that is fully pegged to the US \$, and, second, the Muribatun International Movement (Vadillo, 1996), supported by Mahathir bin Mohamed (the former prime minister of Malaysia), proposed a single Islamic currency pegged to the gold Dinar. To date, neither proposal has been implemented. The target date for the Gulf Cooperation Council (GCC) to form a currency union called “the Khaleeji” in 2010 was unsuccessful and re-planned (Bacha, 2006; Al-Mawali, 2015). However, the movement to use the gold Dinar as a parallel currency continues to emerge among the grassroots communities in some part of Indonesia, Malaysia, and Africa (Yaacob, 2012).

The return to the gold Dinar as a currency has opened the debate among Islamic academicians. Hasan (2012) categorizes three different opinions related to the implementation of gold as a currency from the Islamic perspective. First, some believe that the gold Dinar is the only money according to Islamic law and

accept nothing else. Second, others consider that gold money may be used in parallel with paper money under a condition of the 100% reserve of gold. The last opinion considers that there is no problem in using any kind of money as long as it maintains a stable and fair price for the society. For a long time, some Western economists, mainly from the Austrian school, have been sounding a proposal to set up 100% reserve money, abolish credit banking, disestablish the Federal Reserve, and enact a constitutional law for a balanced budget (Mises, 1953; Rothbard, 1962; Paul, 2009). In 1999, Robert Mundell, the Nobel Prize winner in economics, contended that gold would return to being the main world currency in the twenty-first century (Mundell, 1997).

A few studies have investigated the gold Dinar as a benchmark for the currency union. The early work by Meera and Larbani (2004) showed the opportunities for implementing gold as the currency from the perspective of Islamic principles. Yaacob (2012) mentioned that it is more correct to use Dinar and Dirham as a reserve currency than use gold coins in a direct transaction. The fear concerning gold stock in facilitating output growth is the basis of the argument against the use of gold. If the gold stock is

limited, then the output growth is also limited. However, in the case of international trade, an increase in trade does not necessarily mean that more gold is required physically (Meera and Larbani, 2004), as this is a technical accounting system, in which it is permissible to account for adding the value of the transaction only. Lee (2011), in his research on the gold Dinar, tested the readiness of 24 Islamic countries to form a currency union and found that only a few countries would find it feasible to join such a union. Unfortunately, Lee's study did not technically consider the gold Dinar as a measurable instrument. This paper extends Lee's study by quantifying the gold Dinar into the model.

Currency regimes in the five countries observed experienced a serial adjustment due to internal and external pressures in the form of the financial crisis, the current account deficit, and capital flight. For example, Indonesia's Rupiah depreciated almost 600% during the Asia monetary crisis in 1997/1998 (Hsieh, 2009). At that time, Indonesia adopted a managed float before shifting to a free float in 1998, which still continues. Under the float regime, Indonesia's currency has continued to weaken against the US \$ from IDR 9,500.0 per US \$ in 2000 to IDR 13,000 per US \$ in 2016 (SESRIC, 2017). A somewhat reciprocal experience has occurred in Egypt. Egypt shifted its currency regime from a managed float to a crawling peg in 2001 due to a variety of internal crises that hit Egypt. The deterioration in the economic condition, which was influenced by the September 11 events, pushed Egypt to change its currency regime to a free float in 2003. The present currency regime of Egypt has achieved greater stability than before, and accounts for 6.5 pounds per US \$ on average. In 2002, Turkey altered its currency regime from a crawling band regime (1994-1996) to one targeting inflation, and remains in place today. In contrast to the three countries mentioned above, Saudi Arabia and the UAE chose a fixed currency regime against the US \$, which they have adopted for almost 20 years. Their ability to maintain their currency stability is mostly due to the strength of their foreign exchange reserves. The total reserves of Saudi Arabia are the highest, being 10% of their gross domestic product (GDP), while for the UAE they are only 2%. In contrast, on average, the total reserves of Indonesia, Egypt and Turkey are <1.5% of the GDP (SESRIC, 2015).

This paper computes a gold price as an anchor for the optimum currency area (OCA)-index in selected Islamic nations (there are Indonesia, Saudi Arabia, UAE, Turkey, and Egypt). The findings of this paper may help us to understand how powerful gold can be as a convergent criterion for producing a cycle co-movement of symmetry shock within Islamic nations. This paper is organized as follows: Section two presents the literature review and some empirical findings. Section three provides the methodology. Section four discusses the findings of the study, and the last section is the conclusion and policy implications.

2. THEORETICAL AND EMPIRICAL REVIEW

The theory of OCA, introduced by Robert Mundell (1961), is defined as a domain within which exchange rates are fixed, while

floating against the rest of the world. The group of member states commits to using one new currency and abolishes their own national currencies (De Grauwe, 2014). The proponents of the OCA theory have proposed a number of key criteria that are considered necessary for providing the initial (ex-ante) conditions to enter the union. Mundell (1961) suggested a mobility factor and symmetry of shocks as the most important criteria. McKinnon (1963) extended these to include other critical conditions – trade openness and intensity factors. Kenen (1969) stated that countries that join might not have the same export structure, and, hence, would differ in their main export commodity. The new “endogeneity” OCA theory removes the classical “ex-ante” criteria by proclaiming that candidate countries that fail to satisfy “ex-ante” criteria may fulfill them after (ex-post) they enter the union (Frankel and Rose, 1997).

The OCA theory has long existed in a vacuum in terms of the analytical tools needed to operate its theory. Mundell, McKinnon, and Kenen did not create a quantitative index for OCA, however, after 35 years, Bayoumi and Eichengreen (1997) constructed a procedure for computing OCA within an index. They applied a SD for the change in variability of exchange rates of two pairs of countries that were pegged to hard currencies. A smaller SD means greater opportunity to join the OCA and vice-versa. Besides the OCA-index, the Maastricht criteria have been used for estimating the readiness to join a currency union. These comprise four essential criteria: (1) An inflation rate of <1.5%, (2) interest rate below 2%, (3) fiscal deficit of <3% of GDP, and (4) the government debt should be a maximum of 60% of the GDP. Unfortunately, the Maastricht criteria are considered to be too tight and difficult to implement.

Making gold the benchmark dates back to the era of the coinage system and gold standard, and is based on the price stability under the gold era which lasted more than 3000 years. In contrast, during the era of contemporary fiat money, the world economy has worsened due to chronic serial inflation, currency crisis, and speculative attacks. The superiority of the Dollar has been less healthy since the financial crisis of 2000-2009. In such conditions, being anchored to gold seems to be more appropriate (Krichene, 2013). However, the price of gold has continued to rise sharply in recent times, which makes it less favorable for the countries that import gold. In addition, the gold standard will fail when there are large fluctuations in the world gold market (Frankel, 2003). Furthermore, as the price of gold suffers from fluctuations, the attempt to choose a secure asset is a difficult choice. Whether gold is capable of being a secure asset compared to other assets is an interesting question to examine.

Reverting to gold currency is primarily intended to increase the monetary efficiency and stability. Gold is a hedge to the property haven against other assets. The hedge is defined as assets that are not correlated or negatively associated with the assets or portfolio of others (Baur and Lucey, 2010). Various studies have found significant negative correlations among the gold price and dollar value (Christner and Dicle, 2011; Sujit and Kumar, 2011; Pukthuanthong and Roll, 2011). When the crisis emerged, gold became a prime asset to hold. Baur and Lucey (2006) contended

that gold was not correlated with the market crash in the stock or bond markets. However, evidence from the United States shows that silver, platinum and palladium are a safer haven than gold (Lucey and Sile, 2014). Naser (2017) proved that gold investments provide an effective hedge against inflation for the long-run in US.

Although the contemporary fiat monetary system has taken away gold as a reserve, in the real world, advanced countries compete to buy gold to strengthen their national assets. For example, the European Central Bank increased its gold reserve from 15% in 1990 to 25% in 2009 (ECB, 2010). The GCC countries targeted to have at least 25% of the national reserves backed-up by gold. Other countries with gold reserves above 70%, include the USA, German, Italy, France, Portugal, and Greece. These facts indicate the emergence of a move back to a gold-based monetary system. Krichene (2013) emphasized that the implementation of the gold Dinar in the international monetary system is not technically difficult, and that it simply requires a strong commitment from the governments of various countries.

3. METHODOLOGY

The model used in this paper follows the empirical methodology of the OCA-index derived from Bayoumi and Eichengreen (1997). The OCA-index is rewritten as follows:

$$OCA_Index = SD(\Delta \log e_{ij}) \tag{1}$$

Where, SD is the standard deviation, e is the nominal exchange rate of countries i and j. We extend the OCA-index that is pegged to the Dollar to gold. This is done by replacing e in the equation with gold (in this case, it is noted by g). The gold Dinar model is written as follows:

$$OCA_Index = SD(\Delta \log g_d) \tag{2}$$

Where, g_d is the gold Dinar price. One Dinar is equal to 4.25 g of gold. In the following step, the price of gold in the local currency is standardised to one of the hard currencies in order to be comparable to each other. The model for the gold Dinar can be expressed as follows:

$$g_d = g_k * 4.25 \tag{3}$$

Where, g_d is the gold Dinar price, g_k is the gold price in the local currency after being standardized, 4.25 is one Dinar. The model can be written as follows:

$$g_k = g_r * \frac{e_d}{e_s} \tag{4}$$

Where, g_k is the gold price in local currency after being standardized, g_r is the local gold price in the local currency, e_s is the US \$, and e_d is the local currency. Then we compute the SD of the gold price in countries i and j from year t + 1 to year t. The final step is a comparison between the OCA-index pegged to gold Dinar, and the OCA-index pegged to the US\$. Where a pair

of countries has an SD close to zero, it is considered feasible for them to join an OCA.

The gold price data can be obtained from the World Gold Council (2014). The data for gold prices are available in the local currency. In order to adjust the gold price in the Dinar value, we multiply 1 g of gold at the local currency price to one Dinar (that is equal to 4.25 g of gold). The data related to the nominal exchange rate can be obtained from the publications issued by SESRIC (<http://www.sesrtic.org>). SESRIC is a sub-body of the OIC that regularly publishes socio-economic data for its member countries. The Islamic countries observed in this research, with the exception of Turkey, are included within the top 10 gold consumer countries. Saudi Arabia is ranked sixth in terms of the world’s gold consumption, followed by Turkey, Indonesia, and the UAE, which are ranked seventh, eighth, and ninth, respectively.

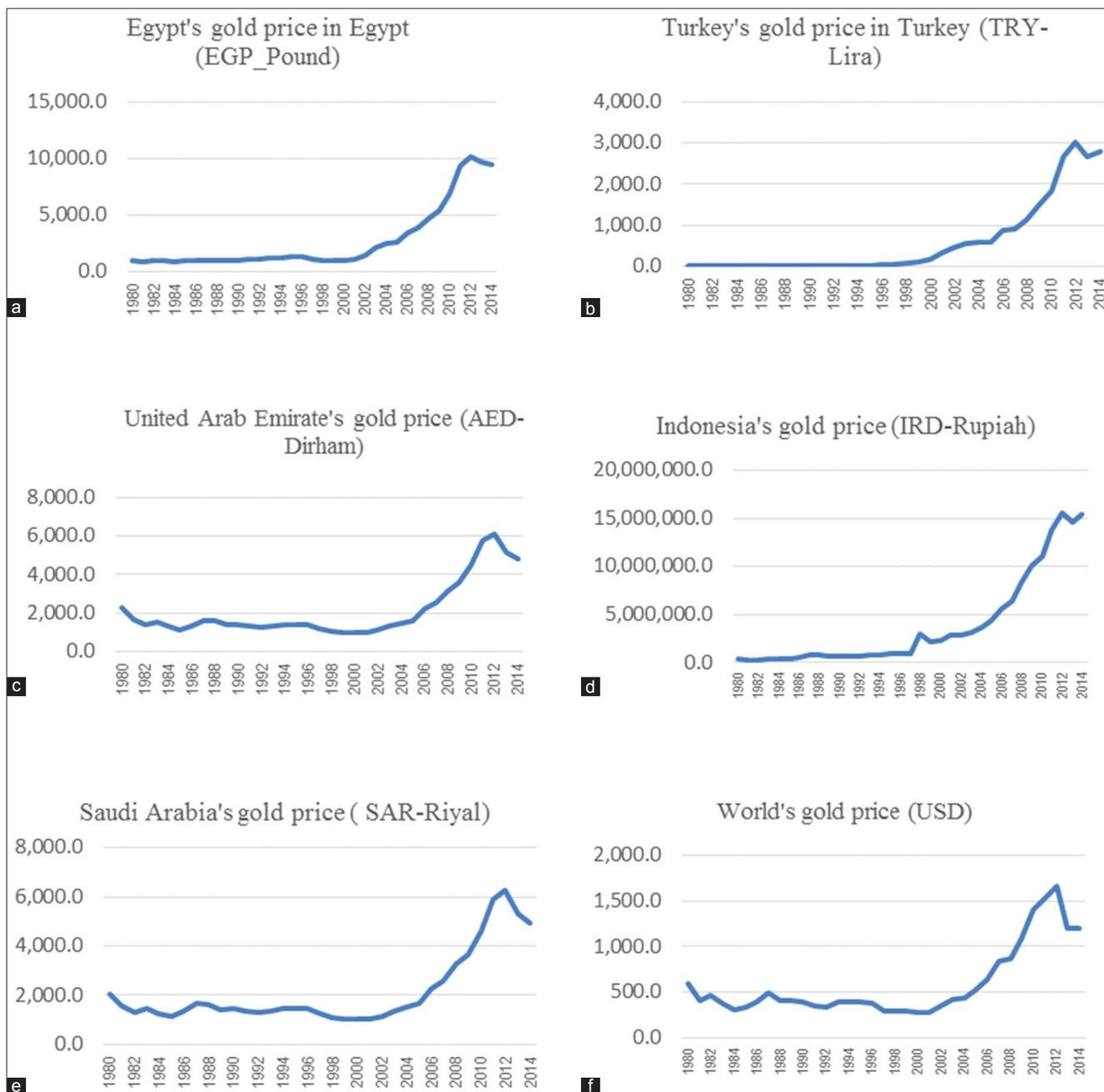
4. FINDINGS

The historical trend of the gold price in Islamic countries has shown a positive linear pattern since the year 2000. Initially, between 1980 and 2000, the price of gold experienced a relatively stagnant pattern. However, after 2000, the price of gold continued to rise significantly until 2014. Changes in the price of gold are influenced by economic and political factors. The world gold prices began to climb since the “September 11, 2001 event,” when the gold price moved from US \$200 per ounce to US \$350 per ounce by the end of 2001. During the Iraq War in 2003, the gold price increased reaching US\$ 400, and continued to move from US \$500 in 2005 to US\$ 730 in 2006. By the end of 2009, it had reached US\$ 900 per ounce. In 2011, for the first time in the history of the world gold price, it exceeded US \$1000 per ounce (Figure 1). Besides the aforementioned reasons of economic and political crises, the rise in the price of gold is partly due to the competition of big countries to use gold to strengthen their foreign exchange reserves. The current global economic stagnation and depreciation of the Dollar has pushed many large countries to hold gold as haven assets (Saidi and Scacciavillani, 2010).

More recently, although there has been a small decline in the world gold price, it has not fallen below US \$1000 per ounce. This decrease relates to the strengthening of the Dollar, which is mainly due to the quantitative easing program in which central banks buy large amounts of stock belonging to US citizens. The program has been quite effective in pushing back the growth of the US economy. In addition, the effect of the exit of the United Kingdom from Eurozone (Brexit) has weakened the Euro, thereby causing an appreciation of the Dollar.

A comparison of the change in gold price and the fluctuation in the exchange rate in the five countries observed shows significant differences. The gold price trend is linear, and even parallel to the trend of the world gold price. In addition, the standard deviation in the gold price shows symmetry between Saudi Arabia and the UAE. In the last two decades, both countries have consistently maintained their respective currencies fixed to the US \$. The symmetry of the gold price between Saudi Arabia and Egypt, Egypt and the UAE, and Egypt and Indonesia is moderate. Only

Figure 1: (a-f) Gold price in Egypt, Turkey, United Arab Emirate, Indonesia, Saudi Arabia, and the world



Turkey shows little-convergence with the other countries under observation (Table 1).

In contrast, the OCA-index which is pegged to the US \$ shows less symmetry. Seven pairs of countries experienced excessive value of the OCA-index. Only three country pairs have a symmetrical pattern; namely, Saudi Arabia and UAE, Indonesia and UAE, and Indonesia and Saudi Arabia. Saudi Arabia and the UAE are perfect examples of where their OCA-index is very symmetrical, measured either by the gold dinar or the US \$. If a country has strong foreign exchange reserves that enable it to control its money market prudently, it may produce currency stability that is similar to what is generated by gold money. In particular, Indonesia's nominal exchange rate against the US \$ is very low

(US \$1 = Rp 11.800 in 2014), but its exchange rate against the Gulf countries is symmetrical. This indicates that the nominal exchange rate is static in nature, and that it is not sufficient to determine the stability of a country's currency. A more relevant instrument is the dynamic change (Δ) of the nominal exchange rate over time, as used in this paper to calculate the OCA-index (Figure 2).

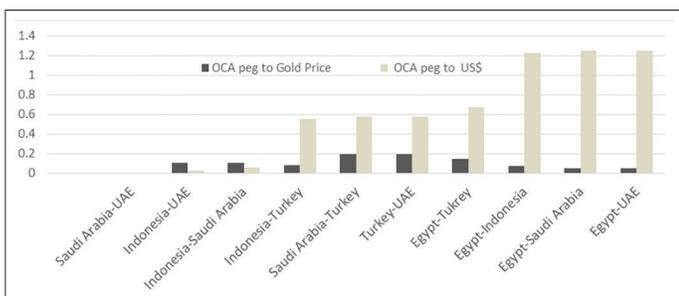
The OCA-index pegged to the gold Dinar produces a more symmetrical value than that of the OCA-index, which is pegged to the US \$. Seven pairs of countries have a symmetrical OCA-Index as calculated by the gold price, while only two pairs of countries were found to be symmetrical using the OCA-index pegged to the US \$. No extreme values of the OCA-index were calculated using the gold price, which varies from 0 up to 0.2. In contrast, the

Table 1: Comparison of OCA-index pegs to gold Dinar and to US \$

Pair of countries	OCA peg to gold price $SD(\Delta \log g_d)$	OCA peg to US \$ $SD(\Delta \log e_{ij})$
Egypt-Indonesia	0.0719**	123.008
Egypt-Saudi Arabia	0.04640**	125.325
Egypt-UAE	0.04651**	125.325
Indonesia-Turkey	0.08256**	0.55498
Saudi Arabia-Turkey	0.19061**	0.57815
Turkey-UAE	0.19073**	0.57815
Egypt-Turkey	0.14422**	0.67510
Saudi Arabia-UAE	0.00000	0.00000
Indonesia-Saudi Arabia	0.10805	0.05392*
Indonesia-UAE	0.10817	0.02317*
Average	0.09891	0.62000

**Does gold show more symmetry than the US \$, *Does the US\$ show more symmetry than gold. Close to zero means more symmetry. OCA: Optimum currency area, SD: Standard deviation

Figure 2: Optimum currency area-index pegs to gold Dinar and pegs to US\$



range of values for the OCA-index pegged to the US\$ were found to vary between 0 and 1.5. The average of the standard deviation of OCA-index pegged to the US \$ is 6 times larger than that of OCA-index pegged to the gold Dinar. The lesson learned from this study is that the gold dinar is more powerful as a benchmark than the US \$ when it is used for assessing the OCA-index.

5. CONCLUSION

This research has succeeded in constructing a model of the OCA-index pegged to the price of gold as a replacement for the conventional OCA-index. This research found that the OCA-Index, when pegged to the price of gold Dinar, shows greater symmetry than the OCA-index when pegged to the US\$. The evidence from this study suggests that gold is a good benchmark for estimating the readiness of a group of countries to form a currency union.

Using the gold price as a proxy for gold money is one of the limitations of this study. Under the gold coinage system, gold is neutral. Gold is measured by its weight and pureness, and not price on its own. Gold has the price since the era of the gold standard when one-ounce gold ratio to a certain currency. In the gold standard system, printing new money needs a 100 per cent gold reserve. Nevertheless, in the contemporary monetary system, the money supply does not require a full gold reserve. Printing paper money without being backed-up by 100% gold is a breach of the monetary discipline. By adopting gold as the benchmark, it

will automatically limit excessive intervention by the authorities. From the policy perspective, a return to the gold system is one clear option, since everything we know about the gold monetary system has proven that it is the most stable system.

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