IDENTIFYING THE OPTIMAL LEVEL OF GOLD AS A RESERVE ASSET FOR OIC COUNTRIES

BY

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ABSTRACT

This research sought to identify the optimal level of gold as a reserve asset to be held in official portfolios in order to enhance stability of nations in times of economic, financial and/or geopolitical turmoil by preserving the value of assets held in central bank reserves. After the collapse of the Bretton Woods fixed exchange rate system in 1971, countries moved towards floating exchange rates and the expectation was that requirement for foreign reserves would decrease. However, central banks currently hold more foreign exchange reserves, with the aim of enhancing the credibility of their exchange rate policy. The demand for gold, which was the main reserve asset prior the collapse of the Bretton Woods system, has increased as a reserve asset once again following the global financial crisis of 2008 (GFC), given gold's characteristics as a safe haven asset and a store of value. The study analysed official reserves of four countries namely, Malaysia, Turkey, KSA and Pakistan. The countries were taken as a proxy for OIC member countries. The Black-Litterman model was used to build a new strategic portfolios with optimal allocation to gold. Another focus of the study was to identify and measure the determinants of the price of gold, which requires analysis of the gold market and other macroeconomic variables. By utilizing Multiple Regression Analysis the study tested the impact of the major economic factors: real interest rates (RIR), inflation rates (CPI), Dow Jones Industrial Average (DJIA), oil price (OP), silver price (SP), M2 money supply (M), USA Dollar Trade Weighted Index (USD Index) and official gold holdings (OGH) on gold prices (GP). To the extent of our knowledge the impact of OGH on GP have not been studied yet. The monthly data for the period from January 2005 to December 2014 was employed. The thesis also identified the opportunity cost of holding gold, in relation to the stock market, for the four countries under the analysis. The focus was to detect if gold acts as safe haven or hedge asset in times of distress. The Threshold GARCH (TARCH) model was utilized. The analysis used daily data for the period 2005-2014 for four OIC member countries: Malaysia, Turkey, KSA and Pakistan. The data for selling prices of gold was represented by selling prices derived from Saudi Gold Exchange (SGE), Pakistan Mercantile Exchange (PMEX), Precious Metals and Diamonds Markets (PMDM) for Turkey and Kijang Emas for Malaysia. The returns on Saudi Stock Exchange (Tadawul), Karachi Stock Exchange (KSE), Borsa Istanbul (BIS) and Kuala Lumpur Composite Index (KLCI) were employed to represent aggregate prices of stock market investment. The study showed that all countries under the analyses should increase their gold holdings to preserve the value of the portfolio during times of financial turmoil. It was also found that gold has safe haven asset features for all four countries under the analysis which shows that gold outperforms the average portfolio during times when stock market faces distress. The results of the Multiple Regression showed that that the variables that have significant impact on GP, for the studied period, are M2 money supply, SP, DJIA, RIR and CPI.

ملخص البحث

سعى هذا البحث لتحديد أنسب كمية للذهب ليكون أصلا احتياطيا في الخزائن الرسمية لأجل تعزيز استقرار الأمم وقت الأزمات الاقتصادية والمالية والجغرافية-السياسية وذلك من خلال الاحتفاظ بقيمة الأصول الموجودة في احتياط المصرف المركزي. بعد انهيار نظام بريتون وودز لثبات معدل الصرف الأجنبي في العام 1971 قامت الدول بتبني نظام الصرف العائم حيث كان المتوقع هو تقليل الاحتياج للاحتياط الأجنبي. ولكن حاليا تحتفظ المصارف المركزية باحتياط من العملات الأجنبية أكثر من ذي قبل بهدف تعزيز مصداقية سياسة معدل الصرف الأجنبي الخاص بها. بالإضافة إلى ذلك ازداد الطلب على الذهب – الذي كان الأصل الاحتياطي الأساسي قبل انهيار نظام بريتون وودز – ليصبح أصلا احتياطيا مرة أخرى منذ الأزمة المالية العالمية للعام 2008 نظرا لخصائص الذهب كأصل آمن ومحتفظ للقيمة. قام هذا البحث بتحليل الاحتياطات الرسمية لأربع دول وهي: ماليزيا، وتركيا، والمملكة العربية السعودية، وباكستان. تم اختيارها كدول تمثل منظمة التعاون الإسلامي. تم الاستعانة بنموذج بلاك ليترمان لبناء محافظ استراتيجية جديدة للنسب الأمثل من الذهب. ركز البحث أيضا على تحديد وقياس محددات سعر الذهب مما تطلب تحليل سوق الذهب ومتغيرات أخرى متعلقة بالاقتصاد الكلي. من خلال تطبيق تحليل الانحدار المتعدد قام البحث باختبار أثر العوامل الاقتصادية الرئيسية وهي: معدل الفائدة الحقيقي (RIR)، ومعدل التضخم (CPI)، ومؤشر داو جونز الصناعي (DJIA)، وسعر النفط (OP)، وسعر الفضة (SP)، والمورد النقدي (M) M2، ومؤشر الدولار الأمريكي المرجح للتجارة (USD Index)، وأرصدة الذهب الرسمية (OGH) على أسعار الذهب (GP). حتى هذا التاريخ لم تتم دراسة أثر أرصدة الذهب الرسمية على سعر الذهب بشكل شامل حيث تم تحليل البيانات الشهرية من يناير 2005 لغاية ديسمبر 2014. قام البحث أيضا بتحديد تكلفة الفرصة البديلة لأرصدة الذهب فيما يتعلق بسوق الأوراق المالية للدول الأربعة الخاضعة للتحليل. كان محور التركيز هو كشف إن كان الذهب يعمل كملاذ وأصل وقائي في أوقات الأزمات. تم الاستعانة بنموذج التباين المشروط للانحدار الذاتي العام العتبي (Threshold GARCH). خلال التحليل تم الاستعانة ببيانات يومية لفترة 2005-2014 للدول الأربعة الأعضاء في منظمة التعاون الإسلامي وهي ماليزيا وتركيا والمملكة العربية السعودية وباكستان. تم استنباط البيانات المتعلقة بأسعار بيع الذهب من بورصة الذهب السعودية (SGE)، وبورصة باكستان التجاري (PMEX)، وسوق المعادن الثمينة والألماس (PMDM) بالنسبة لتركيا، وكيجاغ اماس (Kijang Emas) بالنسبة لماليزيا. تم الاستعانة بعائدات كل من السوق المالية السعودية (تداول)، وسوق الأوراق المالية في كراتشي (KSE)، وبورصة إسطنبول (BIS)، ومؤشر كوالا لمبور التركيبي (KLCI) لتمثل الأسعار الإجمالية لاستثمارات سوق الأوراق المالية. أظهرت نتائج الانحدار المتعدد أن كل من المورد النقدي (M) M2، وسعر الفضة (SP)، ومؤشر داو جونز الصناعي (DJIA)، معدل الفائدة الحقيقي (RIR)، ومعدل التضخم (CPI) لديها أثر معتبر على أسعار الذهب (GP) خلال الفترة التي تم تحليلها. أظهر البحث أنه على هذه الدول الأربعة زيادة أرصدتها من الذهب للحفاظ على قيمة المحافظ خلال أوقات الأزمات المالية. توصل البحث أيضا إلى أن الذهب أصل يتصف بأنه ملاذ آمن للدول الأربعة جميعها مما يظهر تفوق الذهب على العائدات التقليدية للمحافظ خلال الفترات التي تواجه فيها أسواق الأوراق المالية الأزمات.

APPROVAL PAGE

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DECLARATION

I hereby declare that this dissertation is the result of my own investigation, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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This thesis is dedicated to my beloved parents

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

One of the major developments in the global financial system over the past two decades was the rapid growth of foreign exchange reserves around the world (Mohanty and Turner, 2006; ECB 2006; Hu, 2010). The phenomenon arises as a response to the financial crisis of 1990's when emerging markets started to accumulate enormous amounts of foreign reserves as a self-insurance against the volatility associated with the financial globalization (Aizenman and Marion, 2003; Aizenman and Lee, 2008; Cheung and Ito, 2009).

Due to its role as an international reserve currency, biggest share of foreign reserves held by central banks consists of U.S. dollars (Bordo and Eichengreen, 1993; Bordo, 2008; Eichengreen, 1993, 2004, 2011).

Central bank reserve managers are responsible to their citizens and government for the prudent management of what is part of the wealth of the nation. During 1990s the central bank reserve managers were obliged to obtain a financial return or yield from national reserves whereas after the global financial crisis of 2007 – 2008 (GFC) stability and prudence considered to be more vital. Therefore, the official reserves aimed to cover not only day to day needs for foreign exchange but also preserve their value during times of economic turbulence (WGC 2010a).

The GFC explicitly showed that the U.S. economy and its financial system are fragile in nature and not protected against economic shocks. Therefore, following the GFC central bank reserve managers started to consider the diversification of official reserves and change the composition of official reserves (Aizenman et al., 2015)[1]. Despite the fact that the major share of official reserves is still composed of the U.S. dollar denominated assets, the share of other currencies and commodities such as Chinese renminbi (RMB) and gold is growing significantly over the time (WGC 2015).

Much research also points to the benefits of inclusion of gold holdings as leading 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). Gold reserves are especially important during times of financial or geopolitical turbulences (Harmston, 1998). Traditionally gold has played an important role during times of political and economic turmoil and during equity market crises; when gold has responded with higher prices (Koutsotiannis, 1983; Melvin and Sultan, 1990; Cai et al., 2001; Smith, 2002; Lawrence, 2003).

In the 2004 period as the dollar weakened, gold reached a 16-year high driven also by uncertain economic conditions and geopolitical tensions. (Tuley and Lucey,2006). Therefore, gold is 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. However, 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 US dollar. This makes it an effective hedge against future dollar weakness. This characteristic of gold is particularly relevant for reserve asset managers who anticipate that the RMB will emerge as a serious challenger to the

[1] For example, during the first nine months of 2015 Bank of Russia added 112 metric tonns of gold to its official gold reserves so that increasing it to 1,300 metric tonns which composes 9% of total foreign reserves (Reva, M. 2015)

dollar as the world's reserve currency. Gold is also useful for those who impose constraints on their allocations to dollar-denominated assets. Furthermore, gold has little or no correlation to other traditional or alternative reserve assets (Baur and Lucey, 2010). The diverse drivers of gold supply and demand are independent of, and in many cases opposed to, the forces that determine the value of other assets. This makes gold an effective diversifier that can have a significant positive impact on portfolio performance.

For years, a common reason of reluctance of western investors in investing in gold was that gold has no yield. Meanwhile, following the unconventional monetary policies such as zero interest rates and recently introduced negative interest rates, more than USD 7 Trillion of bonds now are sentence to negative yields. Dissimilar to the rest of the financial assets inclusive of sovereign bonds, physical gold does not have counterparty risk (Mylchreest, 2016). Therefore, following GFC for the first time in two decades, central banks turned into net buyers of gold. In 2011 alone 400 tonnes of gold was purchased by central banks, partly as a response to the reduction of sovereign bonds attractiveness driven by the sovereign debt crises of 2011-2012 (WGC 2012).

Historically, holding large piles of gold indicated global power, as gold and silver where the foundations of the traditional monetary system[2]. The UK, the greatest economic power in Europe during 18th century accumulated a massive amount of gold. Under the gold standard, London established its status as the global financial market and acted as the lender of the last reserve for gold by the early 20th century.

[2] As December 31, 2014 the share of gold in official reserves of Western European countries was as follows: Germany – 67.7% (3,380 metric tons), Italy – 66.5% (2,450 metric tonnes), France – 65.6 % (2,440 metric tons), the Netherlands – 55.0% (620 metric tonnes). The share of gold held by ECB (500 metric tons) constitutes 26.4% of total foreign reserves. U.S. holds 8,130 metric tons of gold which compose 71.9% of national reserves.

More recently, under the Bretton Woods system after the WWII, the U.S. dollar, the only currency pegged to gold, became the key currency for international goods and assets trading. Even after the collapse of the Bretton Woods system, the U.S. remains the dominant economic power and the largest gold holder. Noteworthy that, only in few European countries and in the U.S. the share of gold in foreign reserves is more than 50%. In the rest of the world this figure is about 3 -5%. Consequently, large gold positions of a central bank remain a signal of economic might, as may be the case if gold provides ‘safe haven’ services at times of global turbulence (Aizenman and Inoue, 2013).

Emerging economies such as China, India and Russia started to sharply increase their official gold holdings aftermath of the GFC. Today Russia and China buy gold to get rid of the weakening dollar. According to the recent statistics, central banks of China and Russia have been adding to their gold reserves. So that, as of December 2015, China is 6th largest gold holder in the world, Russia is the 7th, and India is the 11th largest. Vast amount of the recent research and articles suggest that these countries are likely to continue to add to their official gold holdings. This trend is consistent with desire of ‘super emerging markets’ to signal their economic power, to diversify their official reserves, and to insure themselves during the global turbulence (Aizenman and Inoue, 2013).

However, central banks of members of the Organisation of Islamic Countries (OIC) have a very negligible allocation to gold, 5.9% of total world gold reserves. Given the safe haven characteristics of gold during the times of financial and/or geopolitical turmoil it is crucial to build up sound gold reserves to prevent Muslim nations from any undesirable ‘black swan’ event.

1.2 PROBLEM STATEMENT

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 requirement for foreign reserves would decrease. On the contrary, central banks today 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, currency have to retain its store of value function and preserve its purchasing power (Abdullah, 2015a). If money is a good store of value, then its purchasing power should be preserved from the time money is received until it is spent (Meera and Larbani, 2009). However, in 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 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 in time of writing (20 April 2015) the price of one ounce of gold is USD 1,254. Accordingly, the value of one dollar in 1971 has fallen to 3 cents in 2016 (=35/1,254), which indicates to the catastrophic collapse in the store of value function of money, during 44-year period of the fiat money 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 GFC, given gold's characteristics as a safe haven asset and a reliable store of value? Gold's negative correlation with the U.S. dollar is in fact one of gold's qualities that many central bank reserve managers consider particularly attractive as a reserve asset: it can serve as a hedge against dollar assets (Bhatia, 2012).

Today one can only assume that central banks do hold the physical gold since according to the requirement of IMF central banks treat gold in vault and gold receivables as a same line item. Note that, despite the fact that in sake of transparency commercial banks for example required treating cash in bank and cash receivables as a separate line items, IMF do not stick on the same principle of transparency when it comes to the official gold holdings (Abdullah, 2015a).

It is remarkable that only 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 is about 3 -5%. Given this under-allocation to gold nowadays it is a significant phenomenon for the emerging market central bankers to identify the optimal level of gold (Bhatia, 2012).

1.3 PURPOSE OF THE STUDY

The central bank reserves managers should have a clear picture of the mechanism of assets they hold in their portfolios. To understand the future behaviour of an asset the reserve manager should know the factors that influence the price of that asset. Another, crucial step is to identify what is the opportunity cost of holding the particular asset in relation to another. Some assets may have good return during normal times but during times of downturn they may follow the general trend, high positive correlation with other financial assets. On the other hand, some assets may be not appealing to the investor during normal times, but significantly over perform the market during times of turbulence. Therefore, the task of the reserve manager is to build a balanced portfolio which will preserve its value in all states of the market, by identifying the optimal weights of the assets included.

The purpose of the thesis is to identify what are the factors that determine the price of gold, what is the opportunity cost of holding gold in relation to the stock market and to identify the optimal level of gold to be allocated in official reserves of OIC member countries which can help to survive any potential financial, global or geopolitical crises.

The study takes four countries as a proxy for OIC namely, Malaysia, Turkey, Pakistan and Saudi Arabia. The countries represent different geographical areas and also have a well-developed Islamic Finance Industry. The countries also classified as the most influential governments among the OIC member countries in terms of political, religious and economic weight activity[3]

As gold has been a liquid asset for centuries with the property to hedge against inflation (Christie-David et al., 2000; Faugere and Van Erlach, 2006; Kaufmann and Winters, 1989; Sjaastad and Scacciavillani, 1996; Tkacz 2007), in times with and without the Gold Standard, much has been written about the influences on the price of gold. However, to our knowledge the literature on the gold price determinants does not examine the effect of the official gold holdings on the price of gold. This study shall fill this gap.

It is also very crucial to identify what is the opportunity cost of holding gold for a reserve manager. How gold acts during times of turbulence in countries under the analysis. Does it display the features of a hedge asset or does it behave as a safe haven asset.

And finally, what is the exact amount of optimal gold holding for each of four central banks under the analysis.

[3] The Organization of the Islamic Conference (OIC) – One Page Summary https://www.scribd.com/document/296491731/OIC-Overview-and-Analysis-1

The purpose of the thesis is to conduct appropriate analyses to find solve the mentioned problems.

1.4 RESEARCH OBJECTIVES

The study aimed to achieve the following objectives:

1. To identify the determinants of the price of gold, which requires the analyses of the gold market and other macroeconomic variables.
2. To identify the opportunity cost of holding gold, in relation to the stock market.
3. To establish the optimal level of gold as a reserve asset for OIC member countries to enhance stability.

1.5 RESEARCH QUESTIONS

1. What are the factors determining the gold prices?
2. What is the opportunity cost of holding gold, in relation to the stock market?
3. What is the optimal level of gold as a reserve asset for OIC member countries?

1.6 SIGNIFICANCE OF THE STUDY

In a number of countries, especially emerging market economies, the public sector has in recent years been accumulating sizeable cross border financial assets, mainly in the form of official foreign exchange reserves. World reserves have risen from USD 1.2 trillion in 1995 to above USD 11 trillion in 2015, growing particularly rapidly since

2002 (ECB, 2006). A significant proportion of these newly accumulated reserves is invested in U.S. Treasury securities. Because, treasuries are seen as a safe investment. The GFC explicitly showed that U.S. economy and its financial system are fragile in nature and not protected against economic turbulences.

Therefore, central bank reserve managers whose objective is to preserve the value of the official reserves started to look at alternative assets.

Gold is only precious metal accepted as a reserve asset. Gold is negatively correlated with other financial assets held in central bank portfolio; it is no one's liability and therefore has zero credit risk (WGC 2010a; Tuley and Lucey, 2006; Aizenman et al., 2015).

The price of gold is affected by various macroeconomic factors (Harmston, 1998; Smith, 2001; Vural, 2003; Tully and Lucey, 2007; Topcu, 2010). However, we don't know what is the correlation sign between gold prices and official gold holdings and if this correlation is significant. Furthermore, the investor should identify what kind of behaviour an asset shall demonstrate during the times of financial distress. Some assets may have an outstanding performance during normal times, which are known as hedge assets. On the other hand the assets which outperform the market during the times of financial 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 of this a reserve manager should have an allocation into the safe haven assets to preserve the value of the portfolio during times of crisis.

Unlike developed countries, emerging countries do not have large gold reserves. Countries like China and Russia started to diversify their official reserves away from US debt government debt. However, it's not clear what is an optimal amount of gold central banks should keep to preserve the value of the portfolio.

The study will contribute to the existing research by determining the factors which affect the price of gold, identifying what role (safe haven or hedge asset) gold plays in jurisdictions under the analysis, and establishing the optimal level of gold reserves in order to help OIC countries withstand financial turmoil.

1.7 ORGANIZATION OF THE STUDY

This research is organized into five chapters. Chapter one is an introduction and includes the background of the study, the purpose of the research, the research questions and objectives, as well as the significance of the research. Chapter two provides a review of the relevant literature. Chapter three presents the research methodology, whilst chapter four present the research findings and discussion, and chapter five provides some concluding remarks and recommendations.