CHAPTER 1

Introduction

1.1 Principles and Rationale

Gold has been the most popular commodity in recent times until now. Gold is unique in that it does not carry a credit risk, so in times of economic uncertainty people turn to gold as a safe investment. At the moment gold is a foundation asset within any long term savings and investment portfolio. Investors need to protect their capital in assets that offer safer stores of value from inflation and exchange rate fluctuations. The price of gold has been continuously increasing every year. The reason investors used to invest in the gold market is because they wanted to diversify portfolio, inflation hedge, currency hedge and risk management such as credit risk, liquidity risk and market risk.

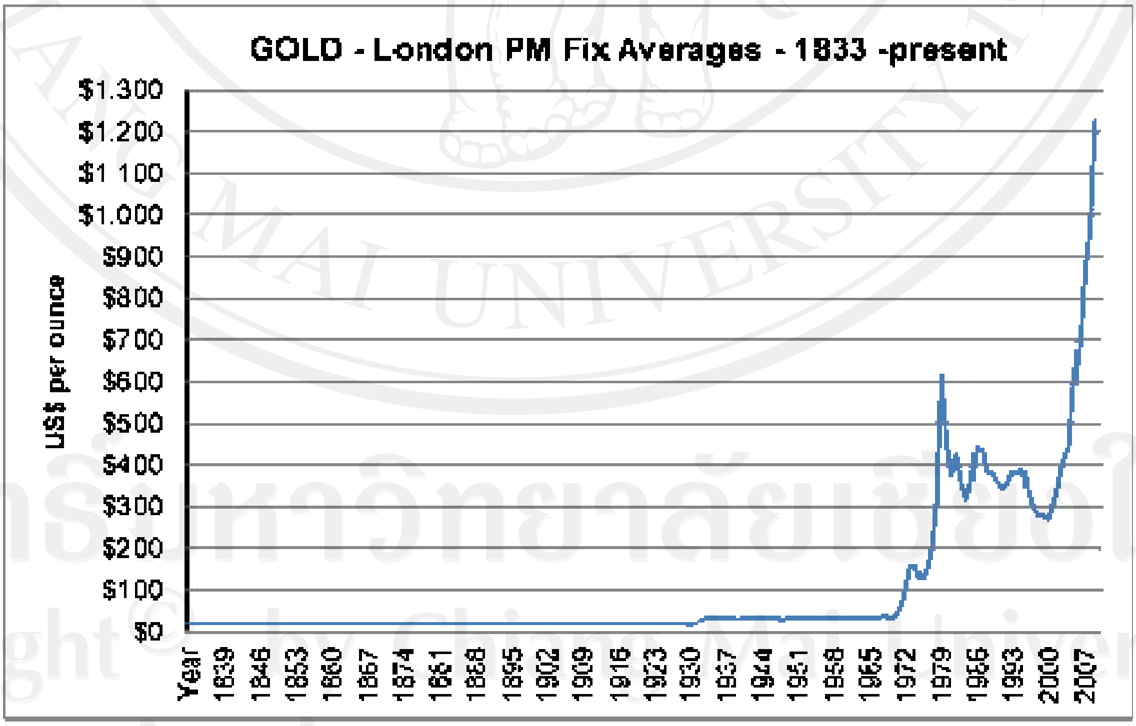

Figure 1.1: Average Annual Gold Prices in US dollar from 1833 to present (unit: USD/Onz)
Source: www.kitco.com

Figure 1.1 shows Average Annual Gold Prices in US dollar from 1833 to present. The gold price was started at $19.75 per troy ounce, raised to $20.67 in 1834, and $35 in 1934. In 1973, the US government set the gold price to $42.22 and the gold standard was given up, so that the dollar could float with other currencies. In 1974 Americans were again allowed to possess gold, and one year later trading of gold futures started at the New York Commodity Exchange and the market price for gold has been free to fluctuate in 1980 at US$ 870. In 2000 the gold price started to go up from US$ 279 until US$ 1,224 in 2010.

The gold price fluctuates because of many factors such as demand, supply and speculation. Figure 1.2 shows the factors for the demand of gold such as jewelry at around 57% from the largest consumers especially India, China and USA accounting for 27% of demand in 2009. Demand of gold investment has many forms for flexibility such as buying physical gold or investing in the futures market in the present and technological demand such as industrial, medical and dental technology that uses around 11% of gold demand. Nowadays, various biomedical applications make use of its numerous attributes including bio-compatibility as well as resistance to bacterial colonization and corrosion. (The World Gold Council, 2011)

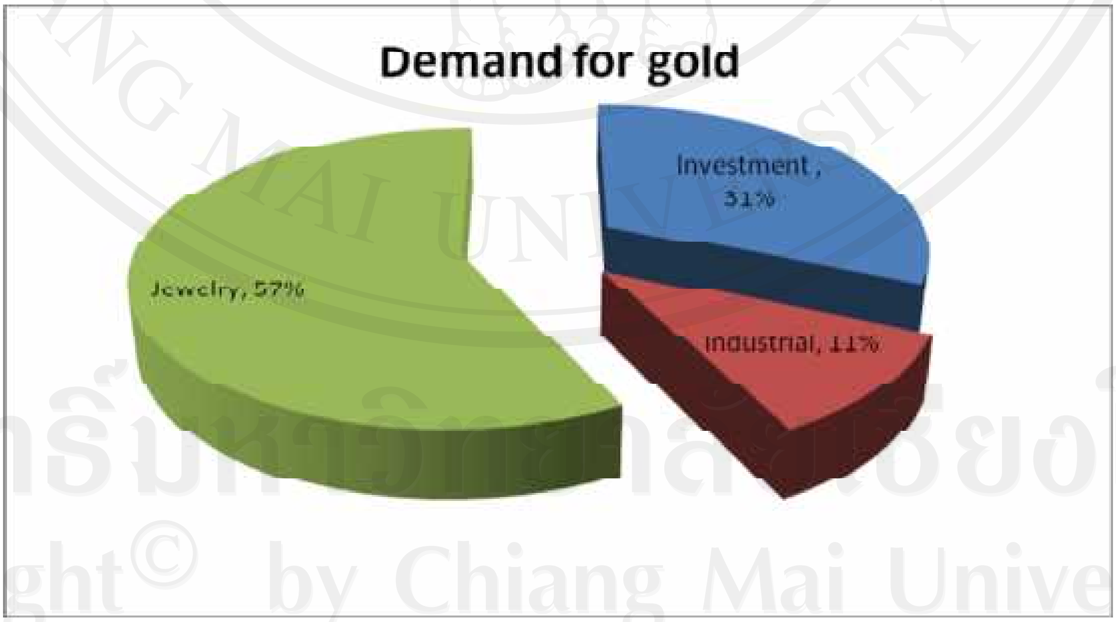

Figure 1.2: Demand Flows, 5 years average (unit: percentage)
Source: The World Gold Council, 2011

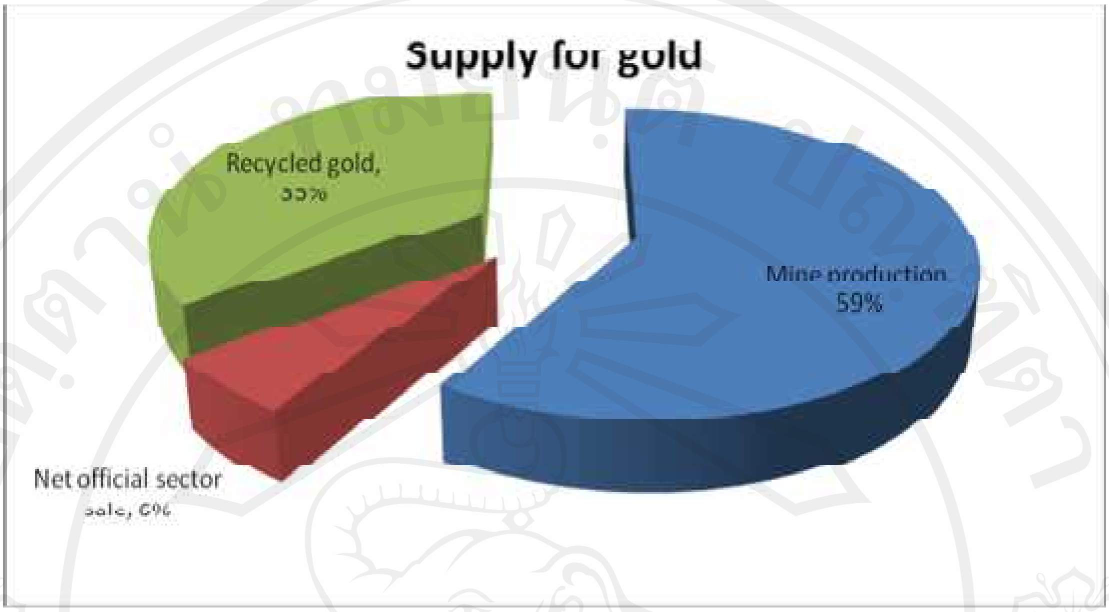

Figure 1.3: Supply Flows, 5 years average (unit: percentage)
Source: The World Gold Council, 2011

Figure 1.3 shows the sources of the supply of gold such as mine production that supplied around 59% from the largest producer especially South Africa. Recycled gold ensures there is a potential source of easily traded supply when demands of gold increases and keep the gold price stable. The official sector especially central banks and multinational organizations (such as the International Monetary Fund) currently hold just under one-fifth of global above-ground stocks of gold as reserve assets. On average, governments hold around 10% of their official reserves as gold, although the proportion varies country-by-country. (The World Gold Council, 2011)

Gold has been valued as a global currency, commodity, an investment or simply an object of beauty. Thus, the gold price has increased continuously for the last 10 years until 2011, shown in the figure 1.4. The gold price has risen to over 20,000 Baht in 2011 from 6,000 Baht in 2002.

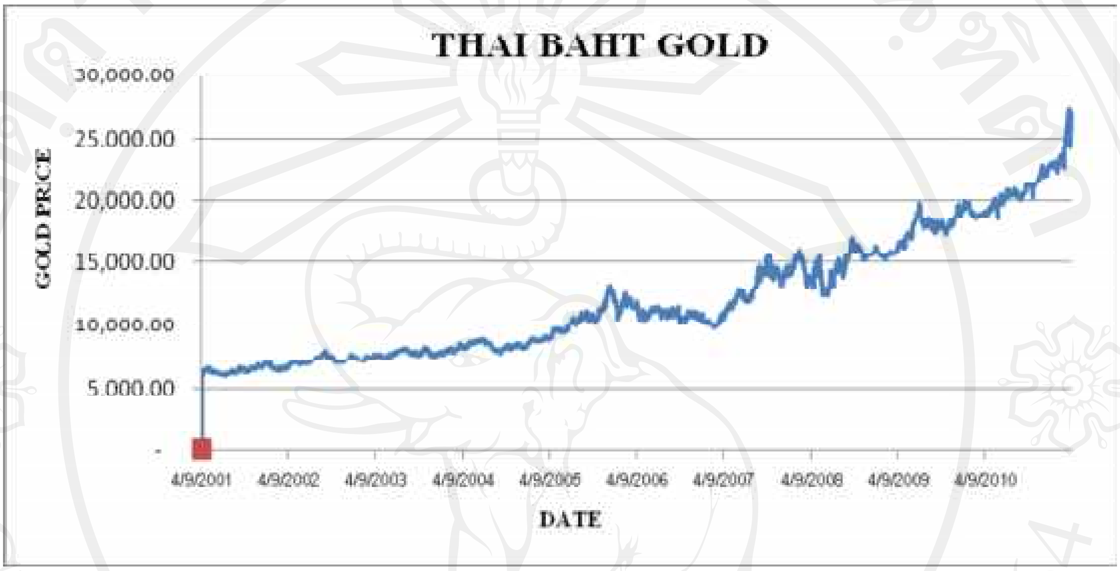

Figure 1.4: Thai Baht Gold from 2001 to 2011 **(**unit: Baht rate)
Source: www.goldpricethai.com

Figure 1.5: Thai Baht Gold spot 96.50% from 2009 to 2011 (unit: Baht rate)
Source: Financial Investment Center (FIC), Chiang Mai University.

Figure 1.5 shows the Thai Baht Gold spot 96.50% which in the form of gold bars with a purity of 96.50% (1 Thai Gold Baht is equal to 15.244 grams).

Figure 1.6: Thai Baht Gold spot 99.99% from 2009 to 2011 (unit: Baht rate)
Source: Financial Investment Center (FIC), Chiang Mai University.

Figure 1.6 shows the Thai Baht Gold spot 99.99% in the form of gold bars with a purity of 99.99% (1 Troy Ounce is equal to 31.1035 grams). Gold is traded continuously throughout the world and is based on the intra-day spot price, derived from over-the-counter gold-trading markets around the world.

Nowadays, investors have regarded gold as a good protection against depreciation in a currency's value, particularly the US dollar.

Figure 1.7: Exchange Rate of THB per USD from 2001 to 2011 (unit: Baht rate)
Source: http://www.indexmundi.com

Figure 1.7 shows the exchange rate of THB per USD from 2001 to 2011 and that now it has decreased continually from September 9, 2001 when the THB per USD exchange rate was around 44.23, until September 1, 2011 when the THB per USD exchange rate was 29.98.

The motivation for this research is that the gold price has increased continuously and the exchange rate of THB per USD decreased continually means that the US Dollar is weakening, the THB currency is strengthening against the US Dollar, so the aim of this study is to examine the best model for predicting the gold market price in Thailand with the exchange rate of THB per USD using ARFIMAX and ARFIMAX-GARCH models. Although, many studies have proposed models to predict stock volatility, only a few of them have applied both models to predict the Thai Baht gold spot price with exchange rate of THB per USD. However, the researcher hopes that this research will be advantageous to those who are interested in the gold market.

1.2 Purpose of the study

1.2.1 To examine the best model using ARFIMAX (p,d,q,X) and ARFIMAX (p,d,q,X)–GARCH (p,q) models to predict the daily closure of Thai Baht gold spot price with exchange rate of THB per USD.

1.2.2 To compare the results and determine the best forecasting model.

1.3 Advantages of the study

1.3.1 To be aware of the best model to forecast the Thai Baht gold spot price with exchange rate of THB per USD.

1.3.2 Investors and organizations can decide whether to invest in the gold market.

1.4 Research designs, scope and methods

1.4.1. Scope

This research studies the best model to compare the Thailand gold market price such as the Thai Baht gold spot price with a purity of 96.50% in the form of gold bars from September 2001 to September 2011 and the Thai Baht gold spot price with a purity of 99.99% in the form of gold bars from September 2001 to September 2011 with exchange rate volatility between ARFIMAX (p,d,q,X) and (p,d,q,X)–GARCH (p,q) models.

1.4.2. Methods

Firstly, adjust the data such as Thai Baht gold spot price 96.50% and Thai Baht gold spot price 99.99% in form of growth rates and test the data using the unit root test. Secondly, estimate the volatility of the Thai Baht gold spot price 96.50% with exchange rate of THB per USD and the Thai Baht gold spot price 99.99% with exchange rate of THB per USD using long memory test. Finally, study the relationship between the Thai Baht gold spot price 96.50% with exchange rate of THB per USD and the Thai Baht gold spot price 99.99% with exchange rate of THB per USD using ARFIMAX (p,d,q,X) and ARFIMAX (p,d,q,X)-GARCH (p,q) models then examine the best model to predict the Thai Baht gold spot price with exchange rate of THB per USD using the minimum value of AIC and BIC, the value of MAE and MAPE (%).

1.5 Overview of data sources

This research used the secondary data, which is the time series data during the period from September 2001 to September 2011 such as the daily closure of Thai Baht gold spot price with a purity of 96.50% in form of gold bars, the daily closure of Thai Baht gold spot price with a purity of 99.99% in form of gold bars and the exchange rate of THB per USD (unit: Baht rate).

1.6 Terminology

Exchange rate[1]**:** the rate at which the country makes exchanges in world market.

Asset[2]**:** any item of value that you own: house, land, gems, stocks, bonds, money in savings, etc.

Bond[2]**:** an IOU issued by a corporation or government that confirms you are lending the corporation or government money. Bonds pay interest regularly to lenders. At the end of the term of the bond, the borrower returns to the lender the face value of the bond (the amount the lender invested in the bond).

Commodities[2]**:** raw materials — such as oil, wheat, soybeans, pork, or gold - you buy. In buying commodities you are hoping that the price will rise, so that you can sell the commodity for a profit.

Invest[2]**:** to put your money into CDs, money market accounts, mutual funds, savings accounts, bonds, stocks or objects that you hope will grow in value and earn you more money.

Risk[2]**:** the likelihood that you will lose money on an investment.

Save[2]**:** saving onto your money for a future use instead of spending it. Saving is the opposite of spending.

Stock Market[2]**:** an organized way for 1) people to buy and sell stocks and 2) corporations to raise money. There are three widely known stock exchanges: The New York Stock Exchange, the American Stock Exchange, and the National Association of Securities Dealers Automated Quotation System (you hear it called NASDAQ on the news).

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[1] N. Gregory Mankiw. **Macroeconomics**, 6th.(New York, USA: Worth Publishers. 2007), pp.557

[2] Commonwealth Credit Union (2011).
Available: http://www.cwcu.org/youth/financialvocab.htm.