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ECONOMIC FORCES ON GOLD PRICE IN MALAYSIA

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Abstract

During the occurrence of a financial crisis, investors will take gold as an alternative to investment as gold is used as an instrument to hedge against inflation. To add, during an uncertain economic condition, investors will flock to the gold market as a protection against uncertainty. The factors specifically influencing the gold price are unknown before, during and after the financial crisis. The main objective of this research is to examine the relationship between macroeconomic factors with gold price before, during and after the financial crisis period in Malaysia. The period of the study encompasses a nine (9) year period starting from years2004 to 2006 as the period before the financial crisis, years 2007 to 2009 as the financial crisis period, and years 2010 to 2012 as the period after the financial crisis. This study is conducted on a monthly data basis. To measure the relationship between the macroeconomic factors and gold price, interest rates, exchange rates, inflation rates and crude oil prices have been selected as the independent variables. From this study, exchange rates are found to have a significant relationship with gold price in the three examined periods and the relationship is defined as an inverse relationship. As for after the financial crisis, inflation rates are found to have a positive significant relationship with gold price, while crude oil prices are found to have a significantly negative relationship with gold price.

Keywords: Gold Price, Financial Crisis, Exchange Rates, Crude Oil, Investment

1.0 INTRODUCTION

Gold has drawn a high amount of attention as investment during financial stress, as all kinds of assets' prices fluctuate intensively during this period. Concerns on gold have grown over the past years as people begin to acknowledge the privileges of engaging with gold as an alternative investment. Gold is one of the instruments that provide healthy returns of investment despite a country's financial condition due to its unique attributes. Investors view gold as the most secure investment in the world. Over the decades and despite the numerous occurrences of economic crises, market panic and financial turmoil, gold has been a tool used by investors to hedge against inflation as gold is a store value at such times. Thus, gold remains the most valuable alternate paper-money until today as its value does not deteriorate much compared to other commodities and investment instruments.

Since 2011, the price of gold has moved freely and the interactions of many factors at once are the key factors that drive the gold price. Hence, more research needs to be conducted to identify the factors that drive the gold price and its fluctuations (Shukur, Zakaria, Affandi, Mansor, & Mahmood, 2015). Ibrahim, Kamaruddin, & Hasan (2014) agreed on this statement and highlighted that no extended study has yet been done on the factors that drive the gold price in Malaysia. Hence, the objective of this research attempts to deliver better knowledge on the factors influencing gold price before, during and after an event of financial turmoil in Malaysia.

2.0 LITERATURE REVIEW

2.1 Gold Price (GP)

Over the past decades, gold has been considered as a safe haven because it has been an imperative asset in the modern capital market (Wang & Chueh, 2013 & Dee, Li, & Zheng, 2013). They further added that gold is the best commodity to preserve capital and as a hedge against recession. The value of gold maintains higher than the value of paper-money, although gold is no longer treated as currency. Due to the attribute of gold which is valuable, it is hardly affected during financial crises. In fact, the value of gold gradually increases through any economic situations. Gold is popular among investors and individuals for its traits of commodity which refers to disinflation. According to a study which aims to identify factors that drive the gold price in Malaysia, Ibrahim et al. (2014) found that gold price is significantly affected by several macroeconomic factors. Shukur et al. (2015) conducted a study to identify the macroeconomic variables that influence the volatility of gold prices. They found that there are few macroeconomic factors that significantly affect the volatility of gold prices in Malaysia. The findings from the study were also supported by Hashim, Ramlan, Razali & Nordin (2017) who applied the same method in identifying the factors that drive gold prices in Malaysia.

Shukri, Mohd Zain, & Zainal Abidin (2016) conducted a study in Malaysia to determine the relationship between selected macroeconomic factors and gold prices, and found that two of the selected factors have a significant relationship with gold prices. Meanwhile, Tufail & Batool (2013) who analysed the relationship between inflation and gold in Pakistan found that gold prices have a significant relationship with selected macroeconomic variables. This proves that gold price is driven by macroeconomic factors, thus indicating that changes in the macroeconomics factors will eventually be reflected in the gold price. This is also supported by a study done in Thailand by Jaraskunlanat & Kijboonchoo (2015). The result from the study shows that three selected variables have a significant effect on gold price.

2.2 Interest Rates (IR)

Interest rates are the principal determinants of commodity prices. In a study carried out by Harvey, Kellard, Madsen, &Wohar (2017), they were able to prove that the interest rates cause commodity prices to change. As gold is considered as a commodity, gold price is also influenced by changes in interest rates. Sindhu (2013) in his study found that interest rates have a significant impact on gold price. This was also supported by studies conducted in Malaysia by Ramlan et al. (2017) and Shukur et al. (2015) which yielded the same results.

2.3 Inflation Rates (INF)

Gold and inflation rates have become controversial issues as several arguments have arisen on whether gold is the perfect mechanism to be used as a tool in hedging (minimizing risk) against inflation. Several

studies have found that gold have the attributes of disinflation. Therefore, gold appears to act as a safe haven for stocks in the United States, United Kingdom and Germany. However, the quality of gold as a hedge against inflation has created many questions as there are issues on whether gold is really a hedge or safe haven against inflation. Dee et al. (2013) conducted a study on the Chinese stock market and the results showed that gold could not be used as a hedge against stock or inflation risk for short term investors, but it can be for long term investors.

2.4 Exchange Rates (ER)

Exchange rates are another variable tested to examine whether gold can act as a hedging tool against the greenback. In the US market, exchange rates are seen to be one of the factors that most significantly influences gold price as shown in astudy carried out by Erdoğdu (2017). This notion is supported by Seemuang & Romprsert (2013) whose study had shown that the exchange rate has been proven to influence gold price movements. Furthermore, S, S, Doss, &Ananth (2014) obtained a similar result.This is further supported by studies conducted by Omağ (2012) in Turkey; Pitigalaarachchi, Jayasundara, &Chandrasekara (2016) in Sri Lanka; and Kamran, Israr, &Rizv (2014) in Pakistan. All three studies have shown that exchange rate significantly changes gold prices.

2.5 Crude Oil (CO)

Crude oil has a fairly significant direct and indirect cost input to the production of gold. Higher oil prices will translate into higher gold prices. It is argued that the prices of gold and oil are related. While there is no apparent intuitive connection between what happens with oil and what happens with gold, a study conducted by Shafiee & Topal (2010) found that crude oil price is significantly related to gold price. The outcome is also supported by Toraman et al. (2011) who found that oil price is significantly related to gold price and determines the factors that affect gold price. In the US market, oil price is seen to be significant to gold price as oil price is taken as the selected variable which explains most of the significant factors influencing gold value. S et al. (2014) and Sindhu (2013) also found similar result from the study they conducted, where the results had shown that oil price influences gold price. Hence, this further strengthens the idea that oil price is one of the factors that is significant to gold price.

2.6 Theoretical Framework

Based on the literature review covered, a theoretical framework can be constructed as below:

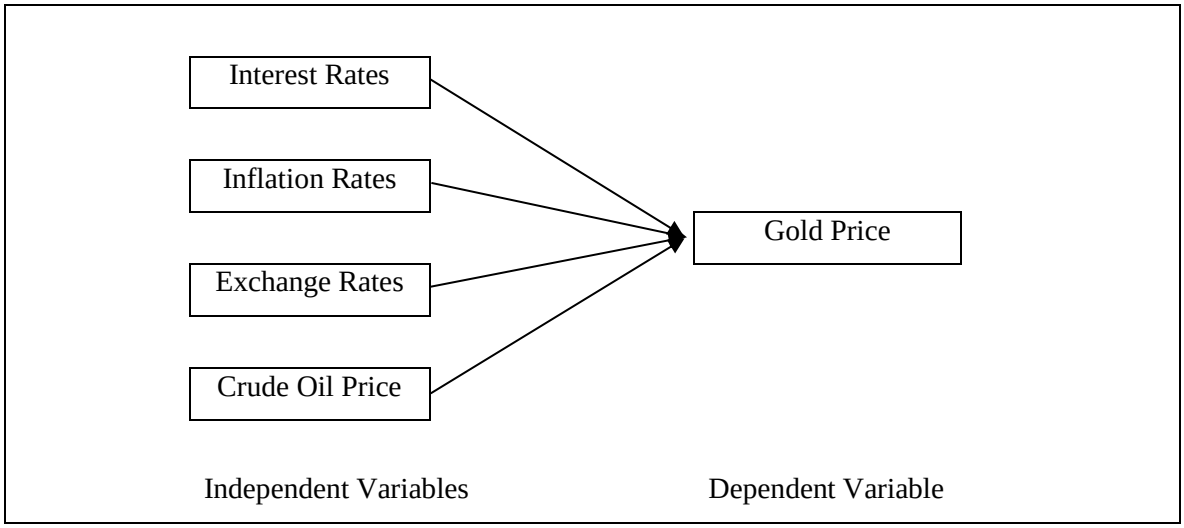

Figure 2.1: Theoretical Framework Modified from Toraman et al. (2011)

2.7 Research Hypothesis

2.7.1 Interest Rates and Gold Price

H_O: There is no significant relationship between interest rate and gold price before, during and after a financial crisis.

H_A: There is a significant relationship between interest rate and gold price before, during and after a financial crisis.

2.7.2 Inflation Rates and Gold Price

H_O: There is no significant relationship between inflation rate and gold price before, during and after a financial crisis.

H_A: There is a significant relationship between inflation rate and gold price before, during and after a financial crisis.

2.7.3 Exchange Rates and Gold Price

H_O: There is no significant relationship between exchange rate and gold price before, during and after financial crisis.

H_A: There is a significant relationship between exchange rate and gold price before, during and after financial crisis.

2.7.4 Crude Oil Price and Gold Price

H_O: There is no significant relationship between crude oil price and gold price before, during and after financial crisis.

H_A: There is a significant relationship between crude oil price and gold price before, during and after financial crisis.

3.0 METHODOLOGY

Data from this study were derived from secondary data and retrieved from websites, Universiti Teknologi MARA's (UiTM) online database, e-newspapers, journals and articles published online. The data were collected in monthly intervals for a period of nine (9) years from 2004 until 2012. The data were primarily obtained from the Bloomberg terminal and the International Monetary Fund website. For this research, the event study method was used to evaluate the gold price's reaction to selected macroeconomic variables specifically in three (3) different time periods namely before, during and after a financial crisis. Figure 3.1 below illustrates the time frame for this research.

Pre-Crisis	During Crisis	Post-Crisis
2004 – 2006	2007 – 2009	2010 – 2012

Figure 3.1: Time Frame (Before Event, During Event & Post-Event Windows)

3.1 Variables

In this study, gold price was taken as the dependent variable that will be influenced by the independent variables. This means that any changes brought by the independent variables will influence the changes in the dependent variable. Changes in the dependent variable will be caused by the explanatory variables. Gold price is defined as the value of gold being traded in the gold market. The gold price can be driven by many various factors. However, in this paper only four independent variables are selected to explain gold price.

Table 3.1: Dependent Variable & Independent Variables

Variables	Operational Definition	Notation
Gold (DV)	The price at which gold is being traded in the gold market.	GP
Interest Rates (IV)	The annualized cost of credit or debt-capital computed as the percentage ratio of interest to the principal.	IR
Inflation Rates (IV)	Increase in general price level and able to reduce the purchasing power of people.	INF
Exchange Rates (IV)	The number of units of one currency that exchanges for a unit of another currency.	ER
Crude Oil (IV)	World's most commonly traded commodity and its price is the most volatile in the market.	CO

This research consists of four (4) fundamental macroeconomic factors which act as independent variables namely interest rates, inflation rate, exchange rate and crude oil. The independent variables are selected

from the literature review conducted and as recommended by the previous study conducted by Toraman et al. (2011).

3.2 Model Specification

The model that was used in this research is the multiple regression model (Least Square Method). This model was modified and adopted from prior studies and used to examine the simultaneous effect of the selected independent variables towards gold price. The model is as follows:

$$\mathbf{GP} = \beta 0 + \beta 1IR + \beta 2ER + \beta 3INF + \beta 4CO + \varepsilon$$

Equation 3.1: Gold Price Model

Where;

GP = Gold Price
IR = Interest Rates
ER = Exchange Rates
INF = Inflation Rates
CO = Crude Oil

4.0 FINDINGS AND DISCUSSION

4.1 Findings

4.1.1 Descriptive Statistics

For descriptive statistics, the data used covered a period of nine (9) years starting from years 2004 to 2006 as the period before the financial crisis, years 2007 to 2009 as the period during the financial crisis, and lastly years 2010 to 2012 as the period after the financial crisis. Table 4.1 below shows the mean, median, maximum, minimum, standard deviation and skewness values of the variables.

Table 4.1: Pre-Crisis Period Descriptive Statistics

	GP	IR	INF	ER	CO
Mean	421.9349	2.702431	2.691031	5.540548	193.7742
Median	395.9030	2.620000	3.042262	5.519677	206.3950
Maximum	578.2896	3.498000	4.734411	5.853358	265.8200
Minimum	311.3720	1.744000	0.837696	5.315493	119.0500
Std. Dev.	82.23688	0.471263	1.063194	0.148527	43.35807
Skewness	0.432313	0.141073	-0.246396	0.453619	-0.195881
Kurtosis	1.764359	2.422473	2.185467	2.175724	1.871997
Probability	0.181629	0.733551	0.506753	0.324042	0.343214

Table 4.1 above shows the gold price in the period prior to the financial crisis (years 2004 - 2006). The mean gold price was recorded at 421.9349 with a standard deviation of 82.23688. The maximum and

minimum gold prices were 578.2896 and 311.3720 respectively. The distribution of gold price is positively skewed to the right with a value of 0.432313. Whereas, the mean for the independent variables which comprises of interest rates, inflation rate, exchange rate and crude oil price showed values of 2.702431, 2.691031, 5.540548 and 193.7742 respectively.

Table 4.2: During Crisis Period Descriptive Statistics

	GP	IR	INF	ER	CO
Mean	516.0865	2.958972	2.704709	3.429167	260.3417
Median	515.7600	3.374000	2.347960	3.454250	252.0600
Maximum	637.9794	3.562000	8.522114	3.692500	430.7800
Minimum	287.1550	1.823000	-2.480159	3.158000	147.6500
Std. Dev.	76.23456	0.672977	2.894243	0.133326	73.37995
Skewness	-0.649681	-0.773030	0.333916	-0.279854	0.678818
Kurtosis	3.704982	1.736914	2.940385	2.502949	2.942513
Probability	0.194173	0.050324	0.713790	0.656883	0.250359

During the financial crisis (from the year 2007 up to 2009), as exhibited in Table 4.2, the dependent variable which is gold price shows a mean of 516.0865 and a maximum value of 516.0865 with a standard deviation of 76.23456. The distribution of gold price is negatively skewed to the left with a value of -0.649681. Meanwhile, the independent variables' mean which comprises of interest rates, inflation rates, exchange rates and crude price oil showed the values of 2.958972, 2.704709, 3.429167 and 260.3417 respectively.

Table 4.3: Post-Crisis Period Descriptive Statistics

	GP	IR	INF	ER	CO
Mean	582.3455	2.848014	2.186740	3.123297	298.8572
Median	584.1642	2.952500	1.923079	3.104569	309.3300
Maximum	693.3348	3.064000	3.510532	3.415688	358.5900
Minimum	470.6873	1.949000	1.221996	2.985283	236.4100
Std. Dev.	58.56145	0.270090	0.783054	0.103283	36.17369
Skewness	-0.065732	-1.919573	0.463306	1.143865	-0.331280
Kurtosis	2.091613	6.038970	1.676195	3.909574	1.844941
Probability	0.531614	0.000000	0.141098	0.010612	0.264515

Table 4.3 above shows a summary of the descriptive analysis results for the period after the financial crisis. Referring to the table, gold price shows a maximum value of 582.3455 with a standard deviation 58.56145. The distribution of gold price is negatively skewed to the left with a value of -0.065732. Meanwhile, the independent variables' mean which comprises of interest rates, inflation rates, exchange rates and crude price oil exhibited the values of 2.848014, 2.186740, 3.123297 and 298.8572 respectively.

4.1.2 Multiple Linear Regression Analysis

The result of the regression analysis for the pre-crisis period shows that the predictor explains .736134 of

the variances. This indicates that 73.61% of the variation in gold price is explained by interest rates, inflation, exchange rate and crude oil price. Meanwhile, the remaining 26.39% can be explained by other factors such as gross domestic product, silver price, unemployment rates, income per capita and others that are not itemised in this research.

Table 4.4: Pre-Crisis Period Multiple Linear Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IR	57.41165	28.90009	1.986556	0.0559
INF	17.47355	20.96175	0.833592	0.4109
ER	-420.9843	206.1280	-2.042344	0.0497
CO	0.153549	0.564245	0.272132	0.7873
C	1769.439	836.2410	2.115943	0.0425
R-squared	0.736134	**F-statistic**		21.62099
Adjusted R-squared	0.702087	**Prob (F-statistic)**		0.000000

As shown in Table 4.4, there is no significant relationship between interest rates, inflation rates and crude oil towards gold price. Therefore, the hypotheses between interest rates and gold price, inflation rate and gold price, and also crude oil and gold price are not supported. Only exchange rate has a significant relationship with gold price at the 5% significant level (p= .0497). This result thereupon suggests that the hypothesis of a relationship between exchange rate and gold price has received strong support, thus theorising that there is a significant relationship between exchange rate and gold price during the pre-crisis period.

The F distribution shows a value of 14.6306 and the p-value is .000000. Therefore, at the 5% level of significance, the null hypothesis is rejected. Hence, this model fits and there is at least one (1) independent variable that can be used to predict the dependent variable.

Table 4.5: During Crisis Period Multiple Linear Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IR	-30.13212	16.60844	-1.814266	0.0793
INF	-7.716815	3.991268	-1.933424	0.0624
ER	-355.9287	113.6374	-3.132143	0.0038
CO	0.269574	0.204046	1.321145	0.1961
C	1776.476	450.8830	3.939993	0.0004
R-squared	0.653718	**F-statistic**	14.63063	
Adjusted R-squared	0.609037	**Prob (F-statistic)**	0.000001	

The result as displayed in Table 4.5 shows that the predictors explain .653718 of the variance. Table 4.5 suggests that there is no significant relationship existing between interest rates, inflation rate and crude oil and gold price. Thus, the hypotheses between interest rates and gold price, inflation rate and gold price and also crude oil and gold price are not supported.

Meanwhile, the exchange rate has a p-value of 0.0038. At the 5% level of significance, it is proved that there is a significant relationship between exchange rate and gold price, with a coefficient of -355.9287. This value indicates a negative relationship, i.e. when the exchange rate rises by 1%, the gold price will drop at about RM355.93.

The F distribution exhibited a value of 14.6306 and a p-value of .00001. Therefore, at the 5% level of significance, the null hypothesis is rejected. Thus, at least one of the independent variables is useful in predicting the dependent variable.

Table 4.6: Post Crisis Period Multiple Linear Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IR	-73.33577	44.93043	-1.632207	0.1128
INF	50.70145	12.50930	4.053100	0.0003
ER	-340.4632	127.6395	-2.667381	0.0120
CO	-0.949965	0.285998	-3.321584	0.0023
C	2027.608	511.8994	3.960949	0.0004
R-squared	**0.538610**	**F-statistic**	**9.047057**	
Adjusted R-squared	**0.479075**	**Prob (F-statistic)**	**0.000058**	

Evidently, only interest rates exhibit no significant relationship with gold price. All other variables (inflation rates, exchange rates and crude oil) were shown to have a significant relationship with gold price. The R-squared of 0.538610indicates that about 53.86% of the variation in gold prices can be explained by variations in interest rates, inflation, exchange rate and crude oil price as included in the model. Meanwhile, the remaining 46.14% can be explained by other factors that are not considered in this research.

The inflation rates have a p-value of 0.0003 which indicates that at the 5% level of significance, inflation rates have a significant relationship with gold price. Also, at the 5% level of significance, the exchange rates have a p-value of 0.0120, thus showing that there is a significant relationship between exchange rates and gold price. Furthermore, crude oil also has significant relationship with gold price with a p-value of 0.0023 at the 5% significance level.

The F distribution showed a value of 9.047057. The p-value for the F-test statistic is 0.000058. Therefore, at the 5% level of significance, the null hypothesis is rejected. Hence, this indicates that the independent variables are useful in predicting changes in gold price.

4.2 Discussion

Quite a few macro-economic factors may drive gold prices to fluctuate, yet the specific factors that influence the movement of the gold price before, during and after financial crisis have yet to be specifically determined. Hence, this research was conducted to see which macro-economic variables will give a significant effect on gold price volatility in Malaysia for three (3) different periods, namely before, during and after the financial crisis.

Table 4.7: Summary of Findings

Period	Result
Before	Only exchange rate has a significant relationship with gold price
During	Only exchange rate has a significant relationship with gold price
After	Inflation rate, exchange rate and crude oil have significant relationships with gold price

In this research, interest rates prove to have no significant relationship with gold price, regardless of any economic condition; either before, during or after the financial crisis. These findings contradict to study conducted by Hashim et al. (2017) which found that gold price is heavily influenced by interest rates. The result also differs from Shukur et al. (2015) who found that interest rates do influence gold prices when exploring gold price determinants in Malaysia. Another study conducted by Wang & Chueh (2013) likewise found that interest rates are one of the factors that drive fluctuation in gold prices. However, the results from this study is supported by Erdoğdu (2017) who found that interest rates have no influence on gold prices, thus meaning that a change in interest rates would not contribute to changes in gold price. Another research supporting this study was conducted by Jaraskunlanat & Kijboonchoo (2015) who found that interest rates do not have any significant influence on gold price using data from Thailand. Previous studies are used to support the result of this study so to prove that the result is acceptable. Not only limited to that, the result can also be supported by statements from previous studies which detailed that interest rates have no significant influence at all on gold price such as statements taken from the study conducted in Pakistan by Kamran et al. (2014). The main reason why interest rates do not have any significant relationship with gold price may be because gold prices do not provide any interest or dividend to investors. Hence, any announcements on changes in interest rates will not have any influence on gold price.

Inflation rates show two (2) different results for the periods before, during and after the financial crisis. In the periods before and during the financial crisis, the inflation rate is not a predictor of gold price. These findings are supported by Omağ (2012) who found that inflation rate does not have any significant relationship with gold price. Thus, this shows that changes in inflation rate would not contribute to any changes in gold prices before and during the financial crisis. However, after the financial crisis in Malaysia, the inflation rate has a positive and significant relationship with gold price. The result is supported by the study conducted by Seemuang & Romprsert (2013) which verified that the inflation rate is an instrument used as a defense against inflation as gold is considered a foundation asset in Indians households in the form of investment. This explains the notion that an increase in inflation rate will account for an increase in gold prices. Apart from that, another study conducted by Sindhu (2013) also found that the gold price is influenced by inflation rate. Consequently, an increase in inflation rate will result in an increase in gold price. These evidences are able to prove that when inflation exists, investors are more attracted to invest in the gold market compared to other investment instruments as the gold market is more stable and gold is a good inflation tool as it is able to provide returns during inflation.

The results of this study show that before and during the financial crisis, exchange rates are found to have a negative relationship on gold price. Nonetheless, exchange rates are shown to have an influence on gold price. The result is supported by Shukri et al. (2016) who showed that exchange rates are negatively significant with gold prices; a rise in the currency exchange rate may lead to a decline in gold prices. On top of that, previous studies by Toraman et al. (2011) and Erdoğdu (2017) also found that exchange rates have a negative and significant relationship with gold price. A study by Kamran et al. (2014) has also contributed the same result where exchange rates were found to be significant to gold priceat the 10% significance level. These evidences further clarify that in times when the currency value is uncertain, the gold market will be used by investors as a protection against uncertainty.

From this study, the findings showed that crude oil does not have any significant relationship with gold prices before and during the financial crisis. The results from this research are supported by the study conducted by Jaraskunlanat & Kijboonchoo (2015) where the results show that crude oil has no significant relationship with gold price. This means that any changes in crude oil will not influence any changes in gold price. However, after the financial crisis, crude oil was found to have a negative and significant relationship with gold price. This can be concluded as that in times of unfavorable movements in the crude oil market, gold will be used as a safe commodity to store and safeguard investors' value.

5.0 CONCLUSION

To sum up the findings, this research has achieved its objectives of examining the factors that influence changes in gold prices. Before the financial crisis, only the exchange rate has a significant relationship with gold price. Meanwhile, during the crisis only the exchange rate has a significant relationship with gold price. Lastly, after the crisis, the inflation rate, exchange rate and crude oil are found to have significant relationships with gold price.

In order to improve this research, further studies could include for example Bitcoin, a cryptocurrency which is the first decentralised digital currency as a variable so as to study the correlation between these two (2) markets. This will be interesting as cryptocurrency is a new player in the investment market. Finally, to enhance the findings of future studies, multiple numbers of countries encompassing the least developing countries, developing countries and well-developed countries can be included to find the correlation and also relationships between selected independent variables and the dependent variable.

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