Assignment

Write Mate

Analysis of the Economic Factors Affecting Silver Price

Name:

Institution:

Abstract

The use of precious metals in the capital markets has been an important aspect of investments management during uncertain times such as economic recession and pandemics. Several macroeconomic factors affect silver price. The purpose of this research is to examine the relationship between silver price and gold price, USD Index, and inflation. The methodology used was a regression analysis of the relationship between Silver price, Gold Price, the USD Index, and Inflation using 3-year data ranging from 2020 to 2022. The regression analysis results found that silver price is negatively related to gold price, positively related to the USD Index, and positively related to inflation. It was concluded that the changes in the macroeconomic environment has a direct impact on silver price. The implication of the research is that further analysis needs to be conducted to verify the results of the study.

Chapter One: Introduction

1.1.Background

The uncertainties in the value of currencies as media of exchange have been observed during economic recession when reduced exchange of goods and services cause devaluation of currencies (Mathiyarasan, Krishnamoorthi, Venkatesh and Immaculate 2021). Investors have usually depended on precious metals as media of exchange. Silver is considered one of the most popularly used precious metals by investors who desire to protect their investments from devaluation of major currencies such as the US Dollar, the Great Britain Pound, the Japanese Yen, the Canadian Dollar, the Swiss Franc, etc (Matiushin 2019). Despite being used previously as a currency, its monetary function has been outweighed by its industrial use in the manufacture of jewelry, watches, and coatings. Since 2006, the silver industry has developed immensely despite the global economic challenges encountered in 2009 such as the real estate crunch, the collapse of the banking industry, and the European debt crisis. The lesson learned from the financial crisis was that it is not sufficient for investors to allocate all their investment in stocks and bonds, because they are subject to risk of losses during economic recession (Nair and Ravichandran 2018). Studies have shown that many investors have found silver and gold as major investment options for heading their assets against economic uncertainties. It is thus necessary to evaluate the factors affecting changes in silver price from the investment perspective to provide insights into when investors need to use silver as an alternative form of investment.

1.2.Problem Statement

Generally, investors are profit maximizers and would like to know how the price of one commodity change under specific economic circumstances. Investment in precious metals such as silver and gold have been identified as an alternative to stocks, bonds, mutual, funds, and index funds (Batten, Ciner and Lucey 2010). Despite the argument that silver is a useful alternative investment during economic uncertainties, few studies have been conducted to determine whether its value increases or decreases under specific macroeconomic circumstances. There are limited scholarly studies examining the ways in which silver price change with the change in gold price, the USD Index, and inflation (Kiss-Dobronyi 2016). This research bridges this gap in research by conducting research on the relationship between silver price and gold price, USD Index, and inflation. The insight from this research can be useful to investors in making decisions such as purchase or sale of precious metals under specific macroeconomic circumstances.

1.3.Research Objectives

The overall objective of this research is to quantitatively examine the relationship between silver price and macroeconomic variables.

The specific objectives that this research aims to achieve include:

I. To examine the relationship between silver price and gold price.

II. To establish the relationship between silver price and the USD Index.

III. To determine the relationship between silver price and inflation.

Chapter Two: Literature Review

2.1. Silver and its Economic Relevance

Silver is a ductile metal with the empirical symbol (AG) whose atomic number is 47. Its physical characteristics include: a shiny white color used to associate it with the moon during early civilization (Sami 2021). Both its thermal and electrical conductivities are excellent. It is used in a wide range of industrial applications such as medicine, food processing, the film industry, auto manufacturing, and the manufacture of solar panels. Due to its attractive physical characteristics and scarcity, it has been appreciated throughout many generations and is associated with wealth and legacy (Cunado, Gil-Alana and Gupta 2019). Siver was also used as money in the years 3400-1800 BC. Historically, silver has been used as a means of exchange and a store of value in a similar manner as gold. In the year 3400 BC in Mesopotamia, silver was used to make payment during trade as well as a store of value.

The economic relevance of silver is illustrated by the fact that it can be used both as an industrial raw material and as an instrument for portfolio diversification. In terms of an asset, silver is used in the same manner as gold to hedge investment from uncertainties and market volatility (Wang 2012). Many studies argue that the performance of silver in the financial market is 80 per cent like gold. Investors in silver and gold can buy them in forms such as coins, bars and bullions, shares of mining companies, silver-backed bonds, futures and options, jewelry, and Exchange Traded Funds (ETFs).

2.2. The Psychology Associated with Gold and Silver

Gold and silver are majorly targeted by investors as forms of investment that can bring returns on investment by generating returns in future. Investors are also inspired to invest in gold and silver due to the perception that other forms of assets can be risky during negative market circumstances. Thus, it is argued that investors' decisions to invest in gold or silver is inspired by either greed or the desire to avoid the loss of their investments. Fear is a situation where investors perceive that they are likely to incur losses under specific economic situations. In such a case, investors take a conservative approach that ensures the safety of their investment is guaranteed. Investors have historically invested in gold and silver as haven assets. Such a case is when the value of the USD depreciates due to slow economic growth and other factors, when investors opt to buy gold and silver. Even though silver and gold are important investment options among many investors, the relationship between the two remains uncertain. This provides an opportunity for research to be conducted to determine the relationship between changes in silver price and gold price.

2.3. Empirical Literature Review

A study by Batten, Ciner and Lucey (2010) examined the impacts of macroeconomic variables on the volatility of precious metal price and found that volatility of gold is dependent on monetary variables. However, silver did not show a relationship with monetary variables. The research concluded that there is limited evidence to support the argument that macroeconomic factors affect the volatility of precious metals. Research by Nair and Ravichandran (2018) focused on the association between the price of gold and silver in a study conducted in the Indian commodity market context. In a study that used regression analysis, it was found that gold price positively affected silver price with an increase in gold price causing a corresponding increase in silver price. Kiss-Dobronyi (2016) examined the differences in silver price under temporal and spatial dimensions in research conducted in several countries in the 19th and 20th century and found that the local environment played a significant role in determining silver price. More specifically, it was noted that international trade contributed greatly towards convergence of silver price. Sami (2021) examined whether the historical long-running relationship between gold and silver price has changed in a study that used data from Indian market between 1978 and 2019. The finding was that there is still strong cointegrating association between silver and gold price in India. The results provide strong evidence that supports the relevance of the two commodities in supporting portfolio diversification. Research by Wang (2012) examined the association between silver price, gold price, and dollar price before and after the mortgage crisis in the United States using data covering the period 1986 to 2012 and found that there exists cointegration between the three variables. The significance of this study is its support for several previously conducted studies that argue that there exists co-movement of the price of gold and silver.

Chapter Three: Methodology

3.1.Research Paradigm

The research paradigm on which this research is based is positivism. According to positivist paradigm, there is true knowledge that can be distinguished from subjective opinions of individuals that can be measured quantitatively through observations, actions, and reactions. The duty of the research is to identify this knowledge through measurement and analysis. According to positivism, something that cannot be measured cannot be known with certainty (Park, Konge and Artino Jr, 2020). The significance of positivism paradigm is its emphasis on quantitative research approach in the collection and analysis of data. It also involves conducting research by accounting for the collective social interest in the subject area of research.

3.2.Research Design

The research design used in this study was empirical research. An empirical research design focuses on identifying research problems, collecting data from relevant sources, analysing the data using valid data analysis techniques, and presents the findings (Feuerverger and Mureika 1977). The methodology used in empirical research may either be experimental or non-experimental. The advantage of empirical research is that it can be used to authenticate previously conducted research on a particular research topic. Furthermore, empirical research is more detailed and provides unbiased understanding dynamic changes in a field of practice. It provides a level of control by empowering the researcher to control several variables. The limitation of empirical research is that it is complex and requires expertise in a particular area of study to conduct accurately and objectively. Empirical research is also time consuming, and researchers are required to collect data from multiple sources to get the relevant data for analysis.

3.3.Data Collection Procedure

The data collection procedure implemented in this research was a secondary data collection from existing online databases that provided statistical information to be used in the analysis of the research topic. The data collection procedure included the extraction of data about silver price in USD, the USD Index, gold price in the UK in USD, and inflation rates in the UK in USD between January 2020 and December 2022.

3.4.Data Analysis Model

The data analysis model implemented in this research was a regression model that aimed at finding a mathematical expression explaining the relationship between silver price and other economic variables, namely: gold price, USD Index, and Inflation. The equation to be derived was in the form:

$Y = \alpha + \beta 1(\text{Gold Price}) + \beta 2(\text{USD Index}) + \beta 3\ (\text{Inflation})$.

Where:

Y is silver price, β1 is the coefficient for gold price, β2 is the coefficient for USD Index, and β3 is the coefficient for inflation.

Microsoft Excel was used to analyze 3-year data obtained between 2020 and 2023 from various digital sources regarding silver price, gold price, the USD Index, and inflation.

Furthermore, data analysis involved conducting scatter plot tests for the relationship between silver price and the independent variables, namely: gold price, the USD Index, and inflation.

Chapter Four: Statistical Analysis of Results and Discission

4.1. Descriptive Statistics

	Silver Price	Gold Price	USD Index	Inflation
Mean	668.89	56534.72	0.0039	8.26
Median	695	57025	0.004	8.35
Minimum	370	45300	0.00	6.5
Maximum	900	64700	0.009	9.6

Table 1. Descriptive Statistics for the results.

It was found that silver price had a mean of £668.89, median of £695, minimum of £370, and a maximum of £900. Gold price had a mean of £56534.72, median of £57025, minimum of £45300, and maximum of £64700. USD Index had a mean of 0.0039, median of 0.004, minimum of 0.00, and a maximum of 0.009. inflation had a mean of 8.26, median of 8.35, minimum of 6.5 and a maximum of 9.6 as illustrated in Table 1.

4.2. Scatter Plot Results

The scatter pot results are as illustrated in Figures 1,2 and 3.

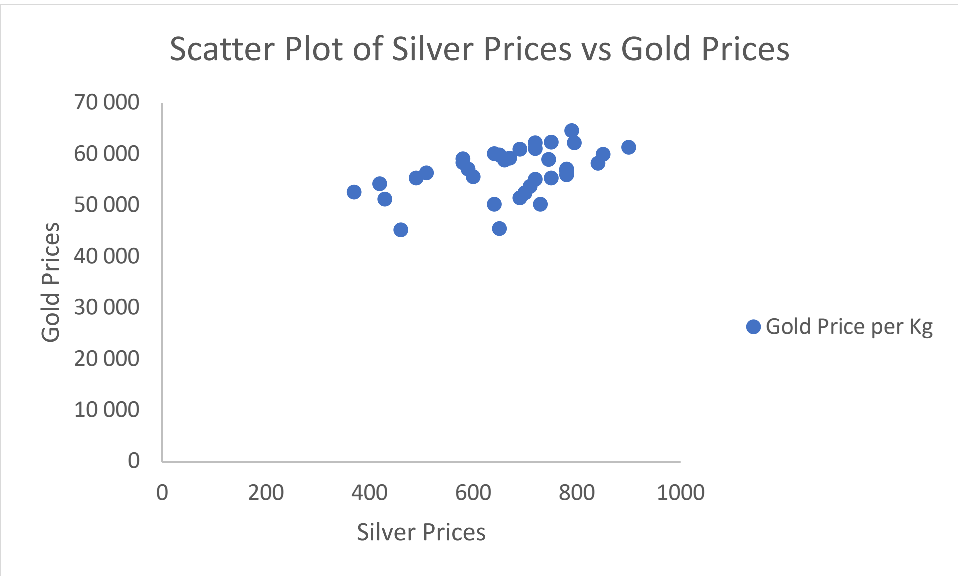

Figure 1. Relationship between silver price and gold price.

It was found that there is a positive relationship between silver price and gold price. This further confirms previously conducted studies that found the existence of a combination between gold price and silver price in the commodity market. A study by Wang (2012) concluded that the cointegration of gold price and silver price is because both commodities are used by investors as heading techniques to protect their investments during volatile economic situations.

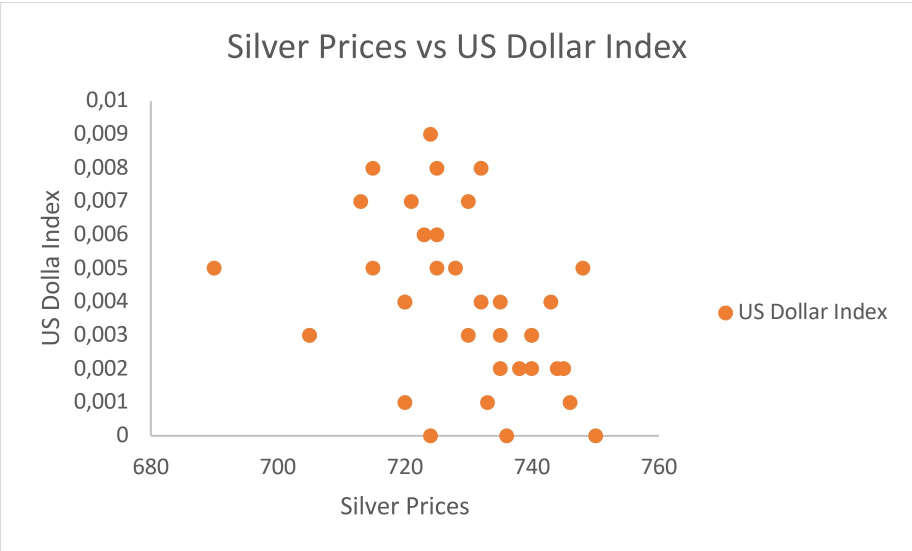

Figure 2. The relationship between silver price and the USD index.

Another major finding was that silver price are negatively associated with the USD Index as illustrated in Figure 2. The findings correspond to the views of Cunado, Gil-Alana and Gupta (2019) who argued that there exists negative association between commodity price and dollar index because investors convert their financial assets such as stocks and bonds into commodities when the dollar price fall. The increase in demand for commodities causes an increase in the price of commodities.

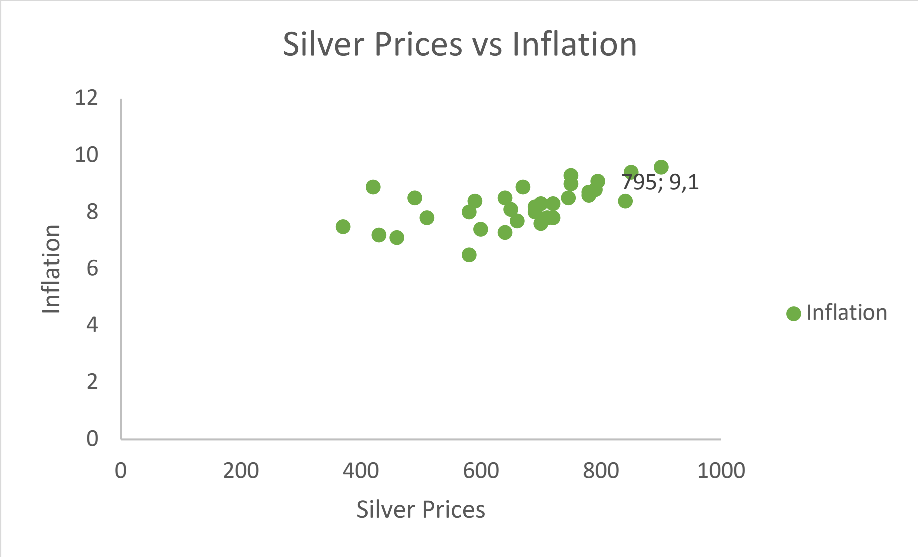

Figure 3. The relationship between silver price and inflation.

Figure 3 illustrates a scatter diagram in which the relationship between silver price and inflation. There is a positive relationship between silver price and inflation showing that a high inflation rate is positively associated with an increase in silver price. According to Cunado Gil-Alana and Gupta (2019), an increase in inflation is associated with a rise in money supply relative to the size of an economy. This causes devaluation of a currency and investors are at risk of incurring losses. Thus, they invest in commodities as safe havens for their financial assets.

4.3. Regression Analysis Results

Regression Statistics	
Multiple R	0.6361
R Square	0.4047
Adjusted R Square	0.3488
Standard Error	101.7610
Observations	36.0000

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	225235.73	75078.58	7.25	0.001
Residual	32	331369.82	10355.31		
Total	35	556605.56			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-351.40	352.10	-1.00	0.33	-1068.61	365.80	-1068.61	365.80
Gold Price per Kg	0.01	0.00	1.41	0.17	0.00	0.02	0.00	0.02
US Dollar Index	-1847.46	9653.20	-0.19	0.85	-21510.37	17815.46	-21510.37	17815.46
Inflation	81.85	32.07	2.55	0.02	16.53	147.17	16.53	147.17

Table 1. Regression analysis results

From the regression model, it was found that R-square was 0.3488 indicating that the model explained 34.88% of the relationship between the dependent and the independent variables. The F-statistic was 7.25 with a p-value of 0.001 which is lower than the significance level of 0.05 thus the model provides a statistically significant description of the relationship between the dependent and the independent variables.

The regression model from the regression table is:

Y = -351.4 + 0.01X1 – 1847.46X2 + 81.85X3

The t-statistic results show that gold prices are positively related with silver prices with a t-statistic of 1.41 and a p-value of 0.17 thus the relationship is statistically insignificant since it is less than 0.05. Similar findings were obtained by Mathiyarasan et al. (2021) who noted that there exists cointegration between gold price and silver price because they are both used by investors as alternative investments when currencies are negatively affected by economic uncertainties.

Silver price is negatively related with the USD index with a t-statistic of -0.19, a p-value of -0.85 thus the relationship is statistically insignificant. Research by Matiushin (2019) found that depreciating dollar rate has a positive impact on silver price thus confirming the study results. The research found that gold is used as hedge against turbulent financial environment. Investors may use these instruments as a store of value under highly risky macroeconomic circumstances.

Silver price is positively related to inflation with a t-statistic of 2.55 and a p-value of 0.02 thus the relationship is statistically significant. According to Wang (2012), high inflation means weakening of currencies and low valuation of stocks and bonds. An increase in inflation inspires investors to seek alternative methods of hedging their financial assets and the demand for commodities such as gold and silver increases.

Chapter Five: Conclusions and Recommendations

The objective of this research was to examine the relationship between silver price, gold price, the USD Index, and inflation. The study used 3-year historical data on the price of silver, gold, the USD Index, and inflation. The finding was that silver prices increase with an increase in gold prices but decrease with increase in the USD Index. When the USD Index increases, investors tend to increase investment in stocks and bonds and this reduces the demand for commodities such as silver and gold. However, it was found that silver prices are positively related to inflation because an increase in inflation implies risky and high uncertainties in the stock and bond markets, hence investors prefer to invest in commodities that preserve the value of their investments. The significance of this research is that it provides a source of useful insight to investors in making relevant decisions to protect their financial assets during uncertainties by investing in silver as one of the hedging techniques.

The practical recommendation is that investment funds managers should use the research findings as framework for decision-making when investing in commodities or financial assets. For instance, they should advice investors to use commodities such as gold and silver to hedge funds when the USD index declines. The scholarly recommendation for this research is the need for further studies to examine other macroeconomic variables affecting silver and gold prices.

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