

Impact of China's Economic Dynamics and Financial Markets on Gold Valuation Master of Science in International Bank and Finance Department of Economics

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Abstract: *Through reference to some literature and comparative analysis, our group found that although there is a lot of research on gold. However, there is relatively little research on the specific factors that affect the price of gold, and there are conflicting claims. Therefore, our team selects data from multiple factors such as investor confidence, average stock price, GDP, and gold reserves from the three aspects of economy, financial market, and market sentiment, and uses regression analysis to study their impact on gold, to find out the real influencing factors. This paper expands on the influencing factors of gold price during bear market periods, and we can conclude that the average factor and trading volume has a negative correlation with the gold price, while gold reserves and other factors have a positive correlation, which is the same as other literature.*

Keywords: *Equity market; Gold; Hedge; bear markets; Correlation; Safe haven*

1. Introduction

The price of gold has always been a favorite issue for people to discuss. In the past two years, the price of gold has increased significantly. The following research will analyze the main factors affecting the price of gold in the Chinese market. First, we found three academic research between the Stock and Gold markets. At the same time, the Chinese market is full of retail investors and noisy traders, and market sentiment can have an impact on the gold price. The literature review used panel data regression and the VAR-GARCH model. This is different from the conditional regression method we used. The data collected in these literature reviews are from different countries, but our report is only used to analyze the impact of the Chinese economic market on the gold price, so we collect the latest data from the Chinese market. Then we downloaded some relevant data from the database to do linear programming. We use the logarithm of the gold price as the dependent variable and the CPI, gold reserves, the average monthly price of the SSE, the economic policy uncertainty index, the trading volume of the real estate index, the SSE trading volume, the consumer uncertainty index, and the consumer economic trend information index as the independent variables. Finally, conclusions are given based on the results and points that need to be improved in the model are proposed.

2. Literature Review

Since the outbreak of the global financial crisis in 2008, the properties of gold have become a more popular investment vehicle. This is caused by the general understanding that gold could act as a tool during losses in periods of market volatility. (Gürkün & Ünalımsı, 2014) In the research by Gözde and Ibrahim, they tested whether gold is a suitable hedge against the stock market investments in some emerging financial markets including China. ^[6]

In the process of their experiments, they found three important conclusions. Firstly, tested countries where gold has hedging properties are higher when the returns on gold and equities are denominated in national currencies. This also suggests that gold is a hedge in the local equity market. This is because in emerging and developing countries, depreciation of the local currency is usually associated with a fall in equity prices, and similarly, a rise in equity prices results in an appreciation of the local currency. There is a statistically significant negative correlation between gold and the stock market in some countries with floating exchange rate regimes, such as Brazil, Hungary, and Turkey. However, no such relationship

was observed in Bahrain, China, and India, countries with fixed exchange rate regimes.

Secondly, there is a strong linkage between equity and gold returns in most countries when equity prices are denominated in US dollars. According to Baur and McDermott's 2010 paper on the BRIC countries similarly found similar results and argued that in response to shocks, this was limited to domestic investors. Foreign investors in emerging markets are more likely to sell their stocks and move their portfolios to developed countries rather than seek safe havens. Thirdly, as gold is a main is a major gold producer, one might expect a positive correlation between stock and gold returns. However, mixed results were discovered from different countries. Gold is a hedge asset in the financial market of Mexico and Peru, but it does not show a property of hedge in China. The reasons may include the size of gold-producing companies in the Chinese stock market.

Mohamed, Amine Lahiani and Duc examine the degree of volatility transmission, portfolio design and hedging effectiveness in the Chinese gold and equity markets. There is a significant volatility transmission between the Chinese stock market and the world gold market.^[5] Tests of the optimal weights and hedging ratios suggest that the optimal portfolio should have a greater weighting in equities than in gold assets, and that it is possible to hedge the risk of equity investments with relatively low hedging costs by shorting in the gold futures market. (El Hedi Arouri et al., 2015)

The VAR-GARCH model they use in their experiments is the best performing model in terms of both diversification and hedge effectiveness. The best-hedged gold equity portfolios outperform traditional equity portfolios regardless of the binary volatility model. Overall, gold assets can be considered a dynamic asset class that can help improve the risk-adjusted performance of highly diversified equity portfolios. During the 2008 global financial crisis, the results suggest that the Chinese stock market decoupled from the world gold market. Moreover, gold assets act as a hedge for equities, in which case Chinese equity investors should be interested in holding more gold than equities in their diversified portfolios.

Elie, David, Rania, and Ata use implied volatility indices and examine the dynamics of short- and long-run causality between gold and the stock markets of China and India from March 2011 to March 2017. Importantly, they find significant bidirectional effects between gold and the Chinese and Indian stock markets at both high and low frequencies, suggesting that gold's safe-haven properties are not stable. (Bouri et al., 2017) Their conclusions suggest that the volatility the Chinese and Indian stock markets lead to the implied volatility of gold at different frequencies, but there is also evidence of a feedback effect, meaning that gold may sometimes behave like a stock. ^[2] While previous research suggests that investors rebalance their portfolios towards less risky assets, such as gold which closely follows the US VIX volatility (Sarwar, 2017), their results suggest that in China and India, investors and traders rebalance their assets or their gold investments, paying close attention to gold and equity implied volatility. ^[13]

3. Summarize the Gap

Three literature reviews above all relate to the impact of the stock market on gold and the domestic economy, corresponding to our theme of analyzing the factors that influence the Chinese economy and financial markets on the gold price. The rise and fall of the stock market can affect a country's economy. When the stock market rises, it attracts more investors, reduces the financing costs of listed companies, and promotes economic development; while when the stock market depresses, it may lead to the withdrawal of investors, increase the financing costs of listed companies, and hinder economic development. The stock market is regarded as a barometer of the economy. It not only reflects changes in the economic cycle through stock price movements but also predicts future economic trends. The trend of the stock market reflects the economic condition of the country. Long-term stock market trends can reflect the economic health of a country. In addition, the stock market is an important channel for national financing. It supports the development of enterprises by providing financing opportunities for listed companies, thereby contributing to the growth of the country's economy.

But in our report, we break down the economic and financial impacts and regress them through a log-linear model. In our report, we will collect data on the following aspects of modeling. CPI, Gold Reserves, SSE Monthly Average Price, Economic Policy Uncertainty Index, Real Estate Index Trading Volume, SSE Trading Volume, Consumer Uncertainty Index and Consumer Economic Trend Information Index.

4. Empirical Methodology and Data

In this study, we extract economic data from the database of Federal Reserve Economic Data and other financial data from Bloomberg. ^[9-12] For detailed research, our data ranged from January 2007 to April 2024, this period included several changes in the financial market in China.

5. Variables

For the dependent variables of the gold price, we select the Gold Spot Chinese Yuan as the representative of the value of gold. This variable reflects the price of gold in Chinese currency, it could be more related to the economic environment in China, and it removes the effects from the exchange rate since some research or data use US dollars as the value for the dollar. We also do not select the local future because of the relatively short history and Gold Spot Chinese Yuan is a contract traded globally in the platform of forex. Moreover, Gold Spot Chinese Yuan is traded around the clock, thus Gold Spot Chinese Yuan could be more liquid and related, and we select its price in a month. Similar to much other research we also pick the Shanghai Stock Exchange (SSE) Composite Index as the representative of performance in the Chinese stock market, these two data came from the database from Bloomberg as well. We used the average of the open price and adjusted the closed price every month as one independent variable. ^[7] The volume of SSE has been adopted since the other research suggests the volume could represent the noise trader's risks in the Chinese stock markets. (Han & Zhang, 2024)

For the economic variables, we use the monthly GDP values of China since this variable is a very significant indicator for an economy. The consumer price index is another important independent variable we used to reflect the macroeconomic environment of China. The consumer price index is also thought to represent the price level of an economy, and this indicator could be used to measure inflation inside a country. Gold has been regarded as assets that preserve values under changes in price level, other research reveals that gold remains a stable value under inflation and shows little volatility compared with other assets. It is the reason that we select the monthly consumer price index as one independent variable.

Apart from these variables that measure economical activities, we believe that the emotion within the economy is also important to consider. Variables include the emotions or expectations that local investors or citizens have for the future of the economy and financial markets. Since China is different from many other markets, many retailer investors exist in the market of equity and other assets, gold has also been regarded as an important asset in Chinese history. Therefore, the expectation arose that local investors could influence the markets.^[3] This proved that noise trader risks in the Chinese market influence the move of prices from another research. (Su et al., 2020) We used the composite Consumer Confidence for China which is built based on consumer opinion surveys. Another data is the Consumer Opinion Surveys for Economic Situation and Future Tendency for China, this index is more about confidence for the future tendency of economic development. After that, we suggest one very important independent variable which is the Economic Policy Uncertainty Index, this index represents the uncertainty arising from government policy, which could influence consumption and investment within an economy.^[1] This index is mostly built from the articles from the news. In our research, we used the index in Mainland areas of China, this index mainly contributed by main newspapers in China, including 'People's Daily' and 'Guang Ming Daily'. Moreover, there is also research that illustrates the spillover effects are significant between EDU and the gold market. (Yaya et al., 2016) These three variables we adopted are to check how expectations from the investors or consumers would affect the value of gold. ^[14]

Lastly, we also selected other variables that include gold reserve which is data from the database in Bloomberg. This data reveals the amount of gold the central bank acquired. The demand for assets may be the direct factor for value and another data that came from the Bloomberg database is the China A-Real Estate Index, we used its trading volume as the indicator for demands for real estate or related assets. We suggest real estate as another important asset in the Chinese economy, it may reflect the change in demand and preferences in assets from investors and traders in the market.

6. Descriptive Statistics

We compute the logarithm value of the gold price in the regression. For predictions of how these variables would influence, we predict the financial variables, the mean price would form a negative coefficient with the price of gold since the common theory in finance states that gold is generally defined as a hedge asset compared with other risky assets. Trading volume for equity may be negatively related

to gold price because more trading in equity may impose less capital for gold in common sense. A similar concept in economics ^[4] show that gold is an asset against recession and inflation in history, thus we predict CPI may cause a positive coefficient with the value of gold. (Iuorio, 2023) Gold reserves represent the demand for gold, the recent news that reported that both investors and central banks keep building the reserves, which may be the factor that pushes the price ^[15], it is predicted to have a positive coefficient with the gold price. Based on recent reports and studies about the Economic Policy Uncertainty Index, the lower confidence that retail investors have, the more gold or risk-free assets would be acquired, and reports also reflect that demand for gold had increased when more investors faced a higher uncertainty derived from the economy. Especially, demands for gold only increased significantly in China in 2023 be an important case for that. (Jia, 2024) two confidence indicators is predicted to have a negative coefficient with the value of gold but EPU may have a positive relationship. ^[8] The trading volume of the house index shows expectations for the popular assets of real estate, this asset normally being popular when the economy experiences fast growth, thus we predict negative coefficients with the gold price. The details and their descriptive statistics are shown in table 1.

Table 1: Descriptive Statistics for All Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Logarithm of Gold	202	9.112	.254	8.519	9.72
Mean Price(SSE)	207	2989.384	648.424	1828.689	5806.033
GDP	204	100.029	1.355	85.393	101.852
Gold Reserve	207	46.264	16.795	19.29	72.74
Uncertainty Index	208	188.274	120.103	28.997	661.828
The volume of house index	208	9.335e+09	7.152e+09	2.490e+09	5.444e+10
CPI in China	207	.191	.543	-1.2	2.6
Consumer Confidence	205	107.912	10.507	85.5	127
Volume (SSE)	207	3946472	2529066.1	861400	13193700
Economic Confidence	206	110.297	11.284	84.2	131

7. Empirical model

We set a control variable for the stock market, we define each period as a bear or bull market based on the performance of the stock market. We assign the period of the bull market the value of 1 and 0 for the bull market to test their influences under different market situations. These dummy variables we created could test whether the results are robust to different situations.

8. Results

Table 2: Descriptive Statistics for Regressions

	1	2	3	4	5	6	7
VARIABLES	log(Xau)	log(Xau)	log(Xau)	log(Xau)	log(Xau)	log(Xau)	log(Xau)
mean price(SSE)	-0.000103***	-9.97e-05***	-0.000116***	-9.80e-05***	-9.65e-05***	-6.02e-05***	-8.96e-05***
	-1.86E-05	-1.82E-05	-1.73E-05	-1.79E-05	-1.91E-05	-1.91E-05	-2.51E-05
GDP	0.0487***	0.0459***	0.0464***	0.0446***	0.0445***	0.0280***	0.145***
	-0.00894	-0.00881	-0.00815	-0.00801	-0.00803	-0.00811	-0.0363
gold reserve	0.0119***	0.00966***	0.00838***	0.00857***	0.00866***	0.00725***	0.0108***
	-0.00075	-0.00103	-0.000977	-0.00096	-0.00104	-0.001	-0.00162
EPU		0.000409***	0.000371***	0.000502***	0.000501***	0.000584***	0.000547***
		-0.000134	-0.000125	-0.00013	-0.000131	-0.000123	-0.000168
house-index(Volume)			0***	0***	0***	0***	0***
			0	0	0	0	0
CPI of China			0.0416**	0.0441**	0.0432**	0.0376**	0.00653
			-0.0202	-0.0198	-0.0202	-0.0189	-0.0201
consumer_conf				-0.00372***	-0.00373***	-0.0435***	-0.0167
				-0.00124	-0.00124	-0.00751	-0.0103
Volume(SSE)					-1.31E-09	-4.23E-09	-2.72e-08***
					-5.67E-09	-5.33E-09	-9.13E-09
econ_confidence						0.0376***	0.00767
						-0.00701	-0.00926
Constant	3.984***	4.282***	4.250***	4.775***	4.776***	6.511***	-4.802
	-0.891	-0.878	-0.813	-0.815	-0.817	-0.829	-3.73
Observations	198	198	198	198	198	198	130
Adjusted R-squared	0.561	0.579	0.64	0.655	0.653	0.697	0.717
Standard errors in parentheses							
*** p<0.01, ** p<0.05, * p<0.1							

9. Interpret the Results

Our group's forecasts are the average price of the equity market, trade volume, and volume of the housing index, and two confidence indicators are forecast to be negative for the price of gold, while gold reserves and uncertainty for retail investors and EPU are positively correlated with gold prices. From the analysis, it can be concluded that the predictions of our group are generally in line with them. Contrary to forecasts, however, the number of housing transactions, economic confidence, and GDP all show a positive correlation with the price of gold according to results in Table 2. This may be related to investor behavior habits and the fact that the amount of data is still not large enough. In the process of analysis, we again divide the data into two parts: the bear market and the general market, since the data is mainly derived from bear market periods, relative results are shown in the last two columns in Table 2, column 6 of Table 2 is under the bull market, column 7 is the bear market. We pay more attention to the analysis results during bear markets.

10. The Key Variables of General Market

The coefficient of price derived from the stock market is estimated to be negative and significant. Average price includes 207 observations, and the estimated coefficient indicates that for every unit increase in average price, the value of gold decreases by 0.00602%. Consumer confidence includes 205 observations, and the estimated coefficient indicates that for every unit increase in confidence, the value of gold decreases by 4.35281%.

The coefficients are expected to be positive and significant for variables of China's GDP including 204 observations, and the estimated coefficient indicates that for every unit of GDP increase, the value of gold increases by 2.79634%. Gold reserves include 207 observations, and the estimated coefficient indicates an increase of one unit in gold reserves, an increase of 0.72547% in the value of gold. Uncertainty for investors includes 208 observations, and the estimated coefficient indicates that the uncertainty increases by one unit and the value of gold increases by 0.05842%. Housing Transaction Volume includes 208 observations, and the estimated coefficient indicates that the housing transaction volume increased by one unit, and the value of gold increased by 8.21e-10%. CPI of China includes 207 observations, and the estimated coefficient indicates that the CPI increased by one unit, and the value of gold increased by 3.75722%. Economic confidence includes 206 observations, and the estimated coefficient indicates that the economic confidence increased by one unit, and the value of gold increased by 3.75983%.

11. The Key Variables of Bear Market

The coefficient is estimated to be negative and significant for the Average price in the Shanghai stock market. It includes 133 observations, and the estimated coefficient indicates that for every unit increase in average price, the value of gold decreases by 0.00896%. The volume includes 133 observations, and the estimated coefficient indicates that for every unit increase in volume, the value of gold decreases by 2.72e+1.2%.

The estimated coefficients are positive and significant for variables: GDP including 130 observations, and the estimated coefficient indicates that for every unit of GDP increase, the value of gold increases by 14.52946%. Gold reserves include 133 observations, and the estimated coefficient indicates an increase of one unit in gold reserves, an increase of 1.07837% in the value of gold. Uncertainty for investors includes 134 observations, and the estimated coefficient indicates that the uncertainty increases by one unit and the value of gold increases by 0.05467%. Housing Transaction Volume includes 134 observations, and the estimated coefficient indicates that the housing transaction volume increased by one unit, and the value of gold increased by 5.87e-10%.

12. Compare the Two Markets

By comparing the general market and the bear market, it can be found that the estimation coefficients of GDP, CPI, and the two confidence indicators in the general market are relatively larger, but the impact of retail investors' trading volume is not significant. In a bear market, the estimated coefficients of GDP and gold reserves are relatively larger, and the trading volume of retail investors has a significant impact. At the same time, after adding variables, the R side changes from 0.7113 in the general market to 0.7371 in the bear market, and the goodness of fit is relatively higher.

13. Conclusion

In this report, our team analyzed and predicted the factors that affect the price of gold. Compared with some previous literature, we have taken into account various factors such as economic form, financial markets, and investors. Through analysis, the average price, overall consumer confidence, and stock trading volume are all negatively correlated with the price of gold. GDP, investor uncertainty, gold reserves, confidence in the economic situation, and real estate transactions are all positively correlated with gold prices, but the influencing factors are different under different conditions, and the trading volume is not significant in the general market, while the confidence index is not significant in the bear market. This proves that when the stock market is down, people are more inclined to buy gold as a hedge. Considering the economic situation, people are likely to maintain the habit of buying gold during the period of China's economic development. This is broadly the same as in other literatures, but there are some differences in individual factors.

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