

An Empirical Study on the Factors Influencing China's Gold Price

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Abstract: Since the collapse of the Bretton Woods system in 1973, the international gold price has no longer been directly linked to the US dollar, and the main factors affecting international gold have increased and become more volatile. Based on this background, gold, as a major commodity, possesses both asset and financial functional attributes. With the continuous opening of China's financial market and the introduction of a series of financial policies, the fluctuation factors affecting gold prices have become one of the topics that have been attracting attention from various parties in the industry. This paper uses Eviews software to analyze a series of variables that directly affect the gold price, and discusses how to confirm which variables are the main factors that ultimately predict the gold market price.

Keywords: China's gold price, US dollar index, Eviews, Empirical analysis.

1. Introduction

Under the international political and economic background of the subprime mortgage crisis sweeping the world, the European debt crisis worsening, the fierce geopolitical competition, the threat of the US dollar's hard currency status, and the increasingly serious inflation, the unique risk aversion and value maintenance and appreciation functions of gold have returned to the public memory, and gold trading has shown an unprecedented dynamic trend. Gold prices have soared, and gold has become one of the important tools for investors.

According to the research results of domestic and foreign experts and scholars, the endogenous factors that affect international gold prices can be basically summarized as gold supply, international crude oil prices, the strength of the US dollar, stock market prosperity, inflation conditions, international political turmoil and wars, etc. So are these factors all having an impact on China's gold price, and what are the dominant factors that play a leading role in China's gold price among these factors? This paper takes the gold price in China's gold trading market as the research object, and uses linear regression model analysis to reveal the dominant factors affecting the price fluctuation in China's gold market, so as to provide reference for individual and institutional investors to make decisions.

2. Related Theories and Literature

2.1. Correlation theory

There are not many pricing theoretical models for gold, and there is no mature and widely recognized gold pricing theoretical model. Therefore, this article mainly focuses on literature analysis.

2.2. Literature

2.2.1. Domestic research status

Liu Hui mainly elaborated on the impact of inflation on China's gold price, as inflation and risk aversion continue to affect the price of gold. Xingyuan, Zhou Tong, and Bai Yunyu analyzed the factors influencing the long-term trend of gold prices. Cao Liying conducted research on the influencing

factors of gold prices and predicted their future trends; Fang Kang used principal component analysis to reduce dimensionality and established a regression model to estimate the impact of relevant indicators on gold prices. After a detailed reading of the literature, we found that the authors believed that inflation, supply and demand of gold, changes in the dollar index, stock price index, crude oil price, federal fund interest rate and official gold reserve had an impact on gold prices.

2.2.2. Abroad Research Status

Brian analyzed the changes in determining factors of gold prices during economic crises caused by market crashes using an asymmetric Power-L ARCH model. Levin and Wright analyzed the short-term and long-term determinants of gold prices. In the short term, gold prices are positively correlated with inflation volatility and credit risk, while negatively correlated with the rental interest rate of gold and the nominal effective exchange rate of the US dollar. In the long run, the price of gold is positively correlated with the level of commodity prices.

We can see from the research of foreign scholars mentioned above. The research objects of foreign scholars mainly focus on the economic indicators of the United States and the relationship between the international price of gold and financial assets measured in US dollars, including the inflation rate and US dollar exchange rate in the United States. Numerous studies have shown that changes in the US dollar exchange rate have the most significant impact on changes in gold prices.

3. Selection of Variables

Based on literature review and survey data, our group selected the main influencing factors for China's gold price in this analysis, including the US dollar, China's economic development, inflation, international crude oil prices, interest rate levels, and the relationship between gold supply and demand.

3.1. The impact of the US dollar on gold prices

Like other commodity prices, gold is denominated in the dollar, which, under other conditions, increases when the

dollar falls and falls when the dollar rises. The DOLLAR index (USD) and gold price (GP) basically move in the opposite direction, with a negative correlation and the negative correlation is statistically significant. Therefore, the trend of the gold price can be judged according to the trend of the US dollar index. And the trend of the dollar index is often associated with the U. S. economy, when the U. S. economy positive, the dollar index will strengthen, such as when the American non-farm payrolls increase, tend to indicate the U. S. economy situation, which leads to raise interest rates, causing investors rushed to buy assets in order to value.

3.2. The impact of inflation on gold prices

Inflation reflects the stability of a country's currency and reflects the purchasing power of its currency. When the inflation level is low, the value of the currency is stable; When the inflation level is high, the purchasing power of the domestic currency is weakened, consumers will lose confidence in the domestic currency. As gold has the intrinsic value and the value of gold, which makes the gold price rise, the holding of gold mainly reflects the function of avoiding the risk of inflation. However, not all countries will increase their holdings of gold when inflation is high, mainly in the United States and countries with high demand for gold and strong investment awareness. Since gold is denominated in US dollars, if U. S. inflation rises, it will strengthen investor expectations of a higher US dollar rate hike, thus strengthening the DOLLAR index and sending gold prices lower.

3.3. The impact of international crude oil prices on gold prices

Since the international crude oil price is also denominated in US dollar, the trend of the international crude oil price and gold price is similar to some extent, when the US dollar price rises, the international crude oil price and gold price fall; when the US dollar falls, the international crude oil price and gold price rise., On the other hand, when the global oil demand growth faster than the supply growth, the trend of international oil prices will rise, the rise in crude oil prices will lead to higher production costs and further push up domestic inflation, and because the inflation level and gold prices have certain positive correlation, so the international rise of crude oil prices will rise in the price of gold.

3.4. The impact of economic conditions on gold prices

When countries maintain stable economic growth, consumer income will gradually increase, consumption level will increase with the increase of income, from a certain extent will lead to the increase of investment demand, so consumers will increase gold jewelry purchase, but also will increase the investment demand for gold, in other conditions under the condition of the same, the increase in the demand for gold will promote gold prices. When an economy recessions, consumers lose less purchasing power, leading to less demand for gold, so gold prices fall. The impact is more reflected in countries where gold demand is high and in countries with high income levels. When the economic

recession occurs in the United States, the situation is different. If the U. S. economy declines, the DOLLAR index will also decline. With the decline of the DOLLAR index, the gold price will rise.

3.5. The impact of interest rates on gold prices

Capital has the nature of profit, the holdings of gold will not get any interest, its investment income only from the gold price rose, when interest rates are low, holdings of gold will get certain benefits, especially when the fed cut interest rates will lead to the dollar index lower, because the dollar index and gold price has negative relationship, so the dollar index will make the gold prices rise. Lower interest rates will also make higher inflation possible in the future, as gold is an inflation-risk hedge, leading to increased demand for gold and further driving up gold prices. When the interest rate is increased or the interest rate is higher than the inflation rate, the interest income will increase, and the opportunity cost of holding interest-free gold is larger, especially when the Fed increases the interest rate, the dollar index will rise, and the rise of the dollar index will lead to the decline of the gold price.

4. Empirical Analysis of The Influencing Factors

The variables analyzed above were selected to correspond to the relevant data

Table 1. Corresponding data

influencing factor	Corresponding data
American dollar	US Dollar Index (USD)
China's economic development situation	GDP
inflation	CPI index number
International crude oil prices	International crude oil prices
interest rate	Deposit interest rate of the People's Bank of China
Gold supply and demand	Per capita disposable income of residents

The data used in the project is annual data, and the sample period is 2002-2019. (T> 15) The sample data is obtained from the official website of the National Bureau of Statistics. Eviews7.2 is used to analyze the influencing factors of China's gold price.

OLS model based on the data, set as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + U_t$$

In this experiment, the purpose is to make the analysis results more practical, and we have reduced the nominal value of GDP (X5).

Table 2. Nominal (X5) GDP

	Nominal GDP (100 million yuan)	GDP index (last year=1)	Real GDP (100 million yuan)	GDP deflator (%)
2000	100280.1	1.030	100280.1	100.00
2001	110863.1	1.033	108639.18	102.05
2002	121717.4	1.031	118561.88	102.66
2003	137422.0	1.130	130463.16	105.33
2004	161840.2	1.131	143657.71	112.66
2005	187318.9	1.114	160026.92	117.05
2006	219438.5	1.127	180383.88	121.65
2007	270092.3	1.142	206054.05	131.08
2008	319244.6	1.037	225939.67	141.30
2009	348517.7	1.094	247175.12	141.00
2010	412119.3	1.136	273464.35	150.70
2011	487940.2	1.070	299582.47	162.87
2012	538580.0	1.079	323140.84	166.67
2013	592963.2	1.078	348236.44	170.28
2014	643563.1	1.074	374095.66	172.03
2015	688858.2	1.070	400436.97	172.03
2016	746395.1	1.038	427861.94	174.45
2017	832035.9	1.039	457586.37	181.83
2018	919281.1	1.037	488472.41	188.20
2019	990865.1	1.031	518318.66	191.17

Among them, Y represents China's gold price, X1 represents the US dollar index (USD), X2 inflation rate (CPI), X3 represents the international crude oil price, X4 represents the interest rate level, X5_r represents the real GDP and X6 represents the per capita disposable income of Chinese residents, and Ut is a random winding term.

X1 as examples)

Y represents the gold price in China from 2002 to 2019. The mean value of Y is 209.5939 yuan; the standard deviation is 95.35163 yuan; the skewness of Y is -0.419656; the kurtosis is 1.825490; the JB statistic is 1.565939; and the corresponding P-value is 0.457733. Because $P > 0.05$, Y accepts the assumption of a normal distribution.

4.1. Descriptive analysis

Descriptive analysis of the selected variables (take Y and

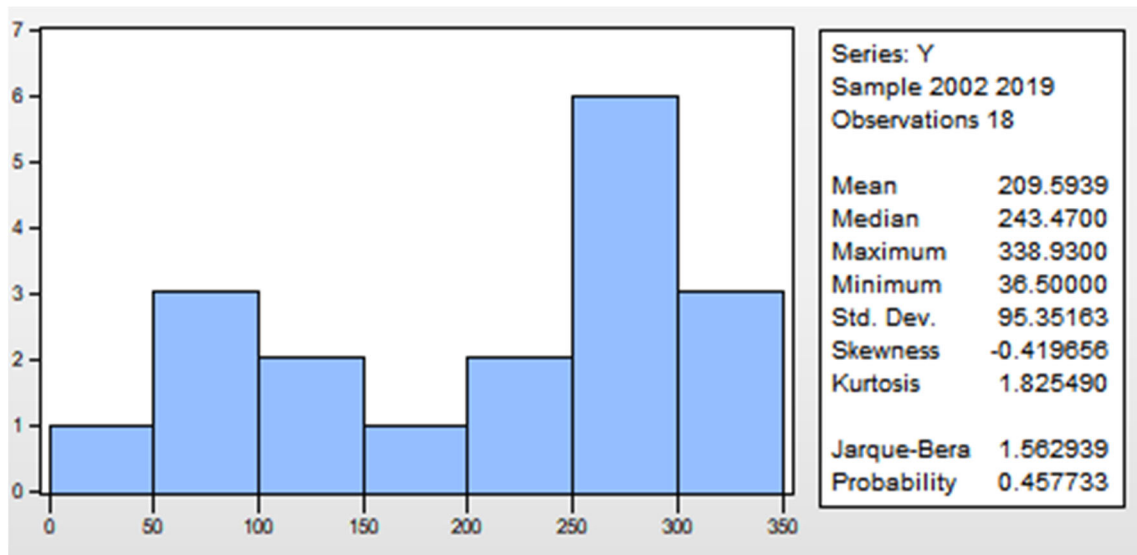


Figure 1. Descriptive analysis of Figure Y

The X1 represents the 2002-2019 US dollar index. The mean value of X1 is 94.09211; the standard deviation is 7.484667; X1 is 0.115524; the kurtosis is 1.932952; the JB

statistic is 0.893981; and the corresponding P-value is 0.639550. Because $P > 0.05$, X1 accepts the assumption of a normal distribution.

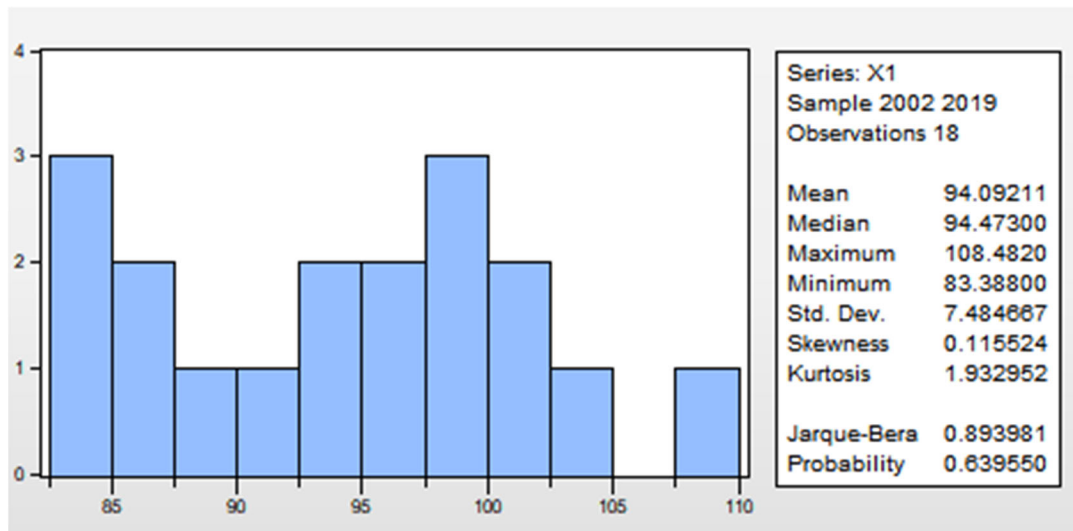


Figure 2. Descriptive analysis of the X 1

4.2. Regression results

4.2.1. First return

$$Y = -5.48185361394 * X1 + 118.746323745 * X2 + 0.260840952213 * X3 - 7.54149293205 * X4 + 0.00121671913634 * X5_R - 0.00901706856102 * X6 + 507.75385908$$

$$R^2 = 0.919031 \quad DW = 1.205815$$

As can be seen from the regression results, the goodness of

fit of the equation is 0.920002, indicating that the fit is good. However, the P values of X1, X2, X3, X4, X5_r, X6 and C are greater than 0.05, so none of them are significant and there is likely to be multicollinearity.

The methods to eliminate multicollinearity include principal component analysis, ridge regression step regression method and difference method. In this paper, stepwise regression method is adopted to eliminate the variables with poor fitting effect.

Equation: UNTITLED Workfile: UNTITLED::Untitled\									
View	Proc	Object	Print	Name	Freeze	Estimate	Forecast	Stats	Resids
Dependent Variable: Y									
Method: Least Squares									
Date: 11/14/22 Time: 18:35									
Sample: 2002 2019									
Included observations: 18									
Variable	Coefficient	Std. Error	t-Statistic	Prob.					
X1	-5.481854	2.700444	-2.029982	0.0673					
X2	118.7463	612.3160	0.193930	0.8498					
X3	0.260841	0.707377	0.368744	0.7193					
X4	-7.541493	19.50834	-0.386578	0.7064					
X5_R	0.001217	0.001491	0.816010	0.4318					
X6	-0.009017	0.022621	-0.398617	0.6978					
C	507.7539	354.3745	1.432817	0.1797					
R-squared	0.919031	Mean dependent var	209.5939						
Adjusted R-squared	0.874866	S.D. dependent var	95.35163						
S.E. of regression	33.72990	Akaike info criterion	10.15995						
Sum squared resid	12514.77	Schwarz criterion	10.50620						
Log likelihood	-84.43953	Hannan-Quinn criter.	10.20769						
F-statistic	20.80913	Durbin-Watson stat	1.205815						
Prob(F-statistic)	0.000021								

Figure 3. Results of the first regression

4.2.2. The second return

The new regression equation is provided with:

$$Y = -6.2050324039 * X1 + 0.000640813943872 * X5_R + 603.919258617$$

$R^2=0.915465$ $DW=1.436426$

As can be seen from the regression results, the goodness of fit of the equation is 0.915465, indicating that the fit is good. The t-test P-values for the coefficients of all explanatory variables were less than 0.05 and all significant. Moreover, the values of AIC, SC and HQC were lower compared to the previous model, so this model was finally selected.

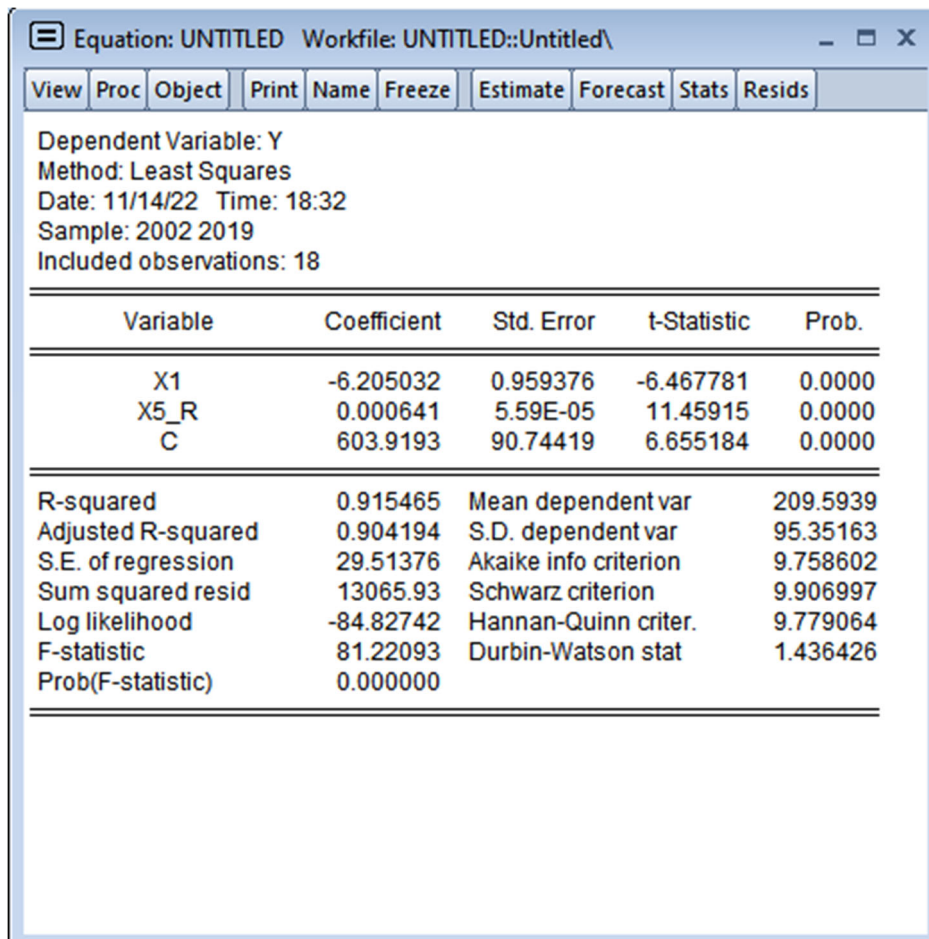


Figure 4. Results of the second regression

4.3. Coefficient interpretation and equation significance

$$Y = -6.2050324039 * X1 + 0.000640813943872 * X5_R + 603.919258617$$

(1) The meaning of β_1 : with other conditions unchanged, on average, the DOLLAR index increased by 1%, and China's gold price decreased by 6.21%.

(2) The meaning of β_5 : other conditions unchanged, in the average sense, China's GDP every change of 1%, China's gold price increased by 0.000641%.

Null hypothesis: $H_0: \beta_1 = \beta_2 = 0$, alternative hypothesis: $H_1: H_0$ is not true,

The F value is 81.22093, check the $F_{0.05}$ value table, $F_c = F_{0.05}(2,15) = 3.68$, $F > F_c$, so the null hypothesis is rejected and the whole equation is significant.

Final choice of regression equation form:

$$Y = C + \beta_1 X1 + \beta_5 X5_r + u$$

Final regression equation:

$$Y = -6.2050324039 * X1 + 0.000640813943872 * X5_R + 603.919258617$$

4.4. Correction and inspection and problem handling

4.4.1. Missetting test

Null hypothesis: There is no missetting

Optional hypothesis: There is a missetting

According to the results we see that $F = 1.213199$

In the F table, the cut-off value $F_{0.05}(2,15) = 3.68$, and the null hypothesis is accepted because $1.213199 < 3.68$, that is, $F < F_c$, there is no missetting in this model.

Ramsey RESET Test
Equation: UNTITLED
Specification: Y X1 X5_R C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.101453	14	0.2893
F-statistic	1.213199	(1, 14)	0.2893
Likelihood ratio	1.495909	1	0.2213

Figure 5. Missetting test

4.4.2. Self-correlation test

The DW value was 1.43426, when $n=18$, $k=2$, $dL = 1.046$,

$dU = 1.535$, the DW value was in the judgment interval, so the LM test was performed.

Table 3. DW Test Form

Durbin-Watson 检验表 (显著水平 $\alpha=0.05$)

n	k=1		k=2		k=3		k=4		k=5		k=6		k=7		k=8		k=9		k=10		
	dL	dU	dL	dU	dL	dU	dL	dU	dL	dU	dL	dU	dL	dU	dL	dU	dL	dU	dL	dU	
6	0.610	1.400	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\
7	0.700	1.356	0.467	1.896	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\
8	0.763	1.332	0.559	1.777	0.367	2.287	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\
9	0.824	1.320	0.629	1.699	0.455	2.128	0.296	2.588	\	\	\	\	\	\	\	\	\	\	\	\	\
10	0.879	1.320	0.697	1.641	0.525	2.016	0.376	2.414	0.243	2.822	\	\	\	\	\	\	\	\	\	\	\
11	0.927	1.324	0.758	1.604	0.595	1.928	0.444	2.283	0.315	2.645	0.203	3.004	\	\	\	\	\	\	\	\	\
12	0.971	1.331	0.812	1.579	0.658	1.864	0.512	2.177	0.380	2.506	0.268	2.832	0.171	3.149	\	\	\	\	\	\	\
13	1.010	1.340	0.861	1.562	0.715	1.816	0.574	2.094	0.444	2.390	0.328	2.692	0.230	2.985	0.147	3.266	\	\	\	\	\
14	1.045	1.350	0.905	1.551	0.767	1.779	0.632	2.030	0.505	2.296	0.389	2.572	0.286	2.848	0.200	3.111	0.127	3.360	\	\	\
15	1.077	1.361	0.946	1.543	0.814	1.750	0.685	1.977	0.562	2.220	0.447	2.471	0.343	2.727	0.251	2.979	0.175	3.216	0.111	3.438	\
16	1.106	1.371	0.982	1.539	0.857	1.728	0.734	1.935	0.615	2.157	0.502	2.388	0.398	2.624	0.304	2.860	0.222	3.090	0.155	3.304	\
17	1.133	1.381	1.015	1.536	0.897	1.710	0.779	1.900	0.664	2.104	0.554	2.318	0.451	2.537	0.356	2.757	0.272	2.975	0.198	3.184	\
18	1.158	1.391	1.046	1.535	0.933	1.696	0.820	1.872	0.710	2.060	0.603	2.258	0.502	2.461	0.407	2.668	0.321	2.873	0.244	3.073	\
19	1.180	1.401	1.074	1.536	0.967	1.685	0.859	1.848	0.752	2.023	0.649	2.206	0.549	2.396	0.456	2.589	0.369	2.783	0.290	2.974	\
20	1.201	1.411	1.100	1.537	0.998	1.676	0.894	1.828	0.792	1.991	0.691	2.162	0.595	2.339	0.502	2.521	0.416	2.704	0.336	2.885	\
21	1.221	1.420	1.125	1.538	1.026	1.669	0.927	1.812	0.829	1.964	0.731	2.124	0.637	2.290	0.546	2.461	0.461	2.633	0.380	2.806	\
22	1.239	1.429	1.147	1.541	1.053	1.664	0.958	1.797	0.863	1.940	0.769	2.090	0.677	2.246	0.588	2.407	0.504	2.571	0.424	2.735	\
23	1.257	1.437	1.168	1.543	1.078	1.660	0.986	1.785	0.895	1.920	0.804	2.061	0.715	2.208	0.628	2.360	0.545	2.514	0.465	2.670	\
24	1.273	1.446	1.188	1.546	1.101	1.656	1.013	1.775	0.925	1.902	0.837	2.035	0.750	2.174	0.666	2.318	0.584	2.464	0.506	2.613	\

4.4.3. Nisoscedasticity test

It can be seen from the White test that the P value of the

three indexes is greater than 0.05, so there is no heteroscedasticity in this model, so the heteroscedasticity elimination treatment is not needed.

Heteroskedasticity Test: White

F-statistic	1.045765	Prob. F(5,12)	0.4354
Obs*R-squared	5.462871	Prob. Chi-Square(5)	0.3620
Scaled explained SS	3.454626	Prob. Chi-Square(5)	0.6303

Figure 6. For heteroscedasticity test

5. Interpretation and Analysis of The Regression Models

First of all, the appreciation or depreciation of the US dollar will directly affect the change of the gold supply and demand relationship in China, thus leading to the change of the gold price. From the perspective of the demand for gold, since gold is denominated in dollars, when the dollar depreciates and uses other currencies to buy gold, the same amount of money can buy more gold, which will stimulate the demand, leading to an increase in the demand for gold, and then push the gold price higher. On the contrary, if the dollar appreciates, gold will become more expensive for investors in other currencies, thus curbing consumption and causing gold prices to fall.

Since the reform and opening up, China has always maintained a stable economic growth, the income of consumers gradually increased, the consumption level with

the increase of income, to a certain extent, will lead to the increase of investment demand, so consumers will increase the purchase of gold jewelry, but also increase the investment demand for gold.

6. Conclusions and suggestions

6.1. Personal level

For our individual to rational investment in China's individual gold investment has just started, the majority of investors generally feel strange to the gold investment. Before that, investors should first master the basic knowledge of gold investment, such as the trading varieties and disadvantages, the pricing mechanism of gold, the fluctuation relationship between gold price and the dollar and international crude oil price, and should also master the basic analysis methods of gold investment, such as the fundamental situation of

individual gold investment in China, supply and demand, and how to analyze the trend of gold price according to important economic data.

Many investors in the spot gold market, will only consider the issue of earnings, but forget to stop losses. If you want to better avoid risks when buying spot gold, you need to do such a few points, it is best to conduct simulated trading in advance, use Doo Prime simulated account trading to accumulate experience but also improve their trading level, to obtain relevant returns to conduct firm trading.

6.2. Government regulation and control

The government should encourage the innovation of gold financial business, which can be considered by promoting the innovation of gold financial products, encouraging the financial market transactions of the gold industry, promoting the gold finance enabled by financial technology, and building a regional brand of gold repurchase.

On the other hand, we should strengthen the supervision and risk prevention and control, and strengthen risk prevention and control and disposal. Under the premise of prudential supervision, promote the application of financial technology and regulatory technology in the field of gold financial regulation. We will give full play to the role of local coordination mechanisms, explore the establishment of a mechanism for risk monitoring, early warning and emergency

response in the gold market, and promptly resolve and handle gold financial risk events. Establish a joint punishment mechanism. Gold and jewelry service platforms, logistics enterprises, fintech enterprises, and third-party intermediaries are encouraged to participate in the construction of the industry credit system. Institutions, enterprises and individuals in the gold financial sector shall be included in the blacklist of "trust-breaking"; those suspected of committing crimes shall be transferred to judicial organs for criminal responsibility according to law.

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