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SỰ ẢNH HƯỞNG CỦA GIÁ DẦU LÊN GIÁ VÀNG VÀ BÀI HỌC CHO VIỆT NAM

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Tóm tắt

Trong bài báo cáo này, chúng tôi cố gắng tìm ra mối quan hệ giữa giá của hai loại hàng hóa chính: dầu và vàng, và chúng tôi muốn kiểm tra giả thuyết, dầu có thể dự đoán vàng. Đã có nhiều nghiên cứu trước đây khẳng định mối quan hệ tương quan giữa mặt bằng giá dầu và mặt bằng giá vàng. Trong nghiên cứu này, chúng tôi sử dụng phương pháp ước lượng OLS để kiểm tra mối tương quan giữa hai biến này. Giá dầu cao được dự đoán sẽ buộc tỷ lệ lạm phát tăng, và do đó, khiến giá vàng, một mặt hàng đại diện cho thị trường hàng hóa tăng lên. Sử dụng dữ liệu có sẵn từ năm 1987 đến năm 2021, kết quả cho thấy rằng, tồn tại một mối tương quan đáng kể và sự gia tăng của giá dầu kéo theo sự gia tăng của giá vàng. Tuy nhiên, điều này chỉ đúng với mặt bằng giá trung bình của thế giới vì nghiên cứu của chúng tôi không có giới hạn ở quốc gia. Dựa trên phân tích ở cấp độ thế giới, chúng tôi cố gắng tìm ra mối liên hệ và những ảnh hưởng đối với cấp độ quốc gia. Ở mỗi quốc gia, trong trường hợp này là Việt Nam, chúng ta cần xem xét nhiều yếu tố trong nước cũng như sự tương tác của dân số quốc gia để quyết định liệu dầu có thực sự dự đoán vàng hay không.
Từ khóa: dầu, giá dầu, vàng, giá vàng, thị trường hàng hóa.

THE IMPACT OF OIL PRICE ON GOLD PRICE AND IMPLICATIONS FOR VIETNAM

Abstract

In this paper, we try to find out the relationship between the price of two main commodities: oil and gold, and we want to test the hypothesis, oil can predict gold. There are a lot of previous research having confirmed the comovement relationship between the oil price levels and gold price levels. In this study, we use the OLS estimation method to test the correlation between these two

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variables. A high level of oil price is expected to force expected inflation rate to rise, and therefore, cause gold price, a good that represents the commodity market to climb up. Using the available data from 1987 to 2021, the result shows that there exists a significant correlation and the increase in the level of oil price is followed by the increase in gold price. However, it is only true with the average world's price level as our research has no country's limitation. Based on the analysis at the world's level, we try to find out the link and the effects on a country's level. In each country, in this case, Vietnam, we need to consider many domestic factors as well as the interaction of the nation's population to decide whether oil really predicts gold.

Keywords: oil, oil price, gold, gold price, commodity market.

1. Introduction

1.1. ***Overview of the study: Relationship between oil price and gold price***

The two markets that best exemplify the broad commodity market are those for crude oil and gold. At first glance, it may not appear that there is a clear connection between the prices of those two commodities, but as we have already indicated, we cannot deny that their combined price movement is directly related to stock market, currency, and inflation fluctuations. Thai-Ha and Youngho (2011) conducted research on "Dynamic Relationships between the Price of Oil, Gold, and Financial Variables in Japan: A Bounds Testing Approach," and they found that the price of gold, among other things, can assist generate expectations of rising inflation over time. Wang et al. (2010) examined the impact of variations in the prices of crude oil, gold, and exchange rate dollars vs various currencies on stock prices, as well as the long- and short-term correlations.

Monthly data of the effective dollar exchange rate, oil, and gold prices from 1976 to 2011 have been meticulously gathered and analysed by using cointegrated VAR model to study the stochastic linkages in order to assess the short-run dynamics and the long-run consequences in terms of shocks. And based on the findings, it can be said that oil and gold are important commodities with different effects on shocks. On the other hand, both commodities appeared to be profitable in the long run, and the system was defined by the gold shocks. Meanwhile, the disparity between the prices of gold and oil has a practical link with U.S. consumer prices and also implies a stronger association between consumer prices and the previous (Beckmann & Czudaj, 2013).

Having realized the importance of the change in oil price and gold price, many scientists have conducted research to examine whether there is a link between the price of those two commodities. Zhang and Wei (2010) found out that with a substantial positive correlation coefficient of 0.9295 for the sample period, which runs from January, 2000 to March, 2008, there are ongoing patterns between the price of crude oil and the price of gold. There is a long- term equilibrium between the two markets, and the volatility of the gold price is caused by changes in the price of crude oil but not the other way around. Along with this research, Ahmad (2018) also confirmed that the two key indicators of major market commodities, namely gold and crude oil, and their incidental interactions, cointegrate. Pairwise Granger Causality Tests revealed that in the long term, Gold Prices Return has Granger Cause on Oil Prices Return and that a change in the prices of Gold may have an impact on the prices of Crude Oil.

Simakova (2011) conducted research utilizing the co-integration test and Granger causality test technique to evaluate the characteristics of the co-movement relationship between the levels of the

oil price and the levels of the gold price over the period from 1970 to 2010. She confirmed that the existence of a real long-term association between particular factors. Bampinas &Panagiotidis (2015) tested the casual correlation between gold and oil prices prior to and following the Great Depression and according to the statistical findings, the relationship between oil and gold was linear and unidirectional prior to the financial crisis. However, the tendency is bidirectional and exhibits a nonlinear causal link throughout the post-financial crisis period. In contrast, during the same post-financial crisis period, the volatility spillover was beginning to emerge as a root of nonlinearity between the two.

Additionally, using dynamic bootstrap causality analysis and cointegration, the time course and incidental interactions of both the return of gold prices and the return of oil prices are examined. According to empirical findings, there is a clear causal link between gold and oil, with gold having a greater short-term impact on oil by increasing it by 30% during the Euro financial crisis. (Georgios & Theodore, 2015).

Muhammad et al. (2017) uses a unique nonparametric causality-in-quantiles testing method to investigate the ability of the price of oil to predict the price of gold. The analysis makes use of weekly data for the spot market as well as the 1-month to 12-month futures markets from April 1983 to August 2016. The nonparametric causality-in quantile test reveals that the oil price has a modest predictive potential for the gold price, which is in contrast to the results of no predictability obtained under incorrectly defined linear structure. Houcine et al. (2020) analyzed and measured the nature of the relationship between crude oil price, EUR/USD exchange rate, and gold price by using monthly data from January 1999 to October 2019.

1.2. The importance of the study: Relationship between oil price and gold price

It goes without saying that our world depends heavily on oil. This black and sticky substance has been dominating our lives, being the primary resource for machines, industries as well as the cause for multiple wars. Then we have gold, the most traded precious metal that has been in favor since ancient times.

Oil price and gold price is tightly woven into each other as they help shape economies. It is believed that the first connection between gold and oil is when producers of the Middle East exchanged crude oil for gold. In 1933, the original Saudi Arabian oil concession could only be traded in gold-which marks the inseparable role of gold in oil markets. Having gone through many historical events, there was a huge development in the relationship of these two commodities and they were no longer determined at the level of payment.

Despite the importance of this issue, there are not many papers or research about it as well as what Vietnam could learn from it. Therefore, the topic: “Effects of oil price on gold price and implications for Vietnam” was chosen by our group in order to study on.

1.3. Objects and Scope of the study: Connection between oil price and gold price

The objects of this topic are oil price and gold price; how oil price influences gold price and implications for Vietnam.

Content scope: How oil price influences gold price

Time scope: Data used in the research range in 1980-2021.

Space scope: The research focuses on the effects of the world's oil price on gold price and how it affects the Vietnam economy.

2. Literature Review

2.1. Definiton of variable

2.1.1. Crude oil

What is crude oil?

According to the U.S Energy Information Administration, Crude oil is a hydrocarbon mixture that exists in liquid form in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separation facilities. It may also include any of the following, depending on the characteristics of the crude stream:

Small amounts of hydrocarbons that exist in the gaseous phase in natural underground reservoirs but are liquid at atmospheric conditions (temperature and pressure) after being recovered from oil well (casing-head) gas in lease separators and then commingled with the crude stream without being separately measured. Lease condensate is a liquid recovered from natural gas wells in lease or field separation facilities and later mixed into the crude stream.

Non-hydrocarbons, such as sulfur and various metals, are present in trace amounts.

Drip gasses and liquid hydrocarbons from tar sands, oil sands, gilsonite, and oil shale.

Petroleum products received or manufactured at a refinery and then injected into a crude supply or reservoir by the same refinery owner or operator.

Liquids produced at natural gas processing plants are not permitted. Crude oil is refined into a variety of petroleum products, including heating oils, gasoline, diesel, and jet fuels; lubricants; asphalt; ethane, propane, and butane; and a variety of other products used for their energy or chemical content.

How is the price of crude oil determined?

The international oil price is determined by both the futures and spot markets. As a result, factors that influence the spot price, such as a supply-demand imbalance, may also influence the futures price. However, in some cases, the two prices may diverge due to special factors that only affect the futures price, such as speculation by investment funds and other financial factors. (European Central Bank, 2014).

2.1.2. Gold

What is gold?

According to the definition proposed by Sara and Latifa (2020), gold is a priceless metal used as a form of payment over the course of history and has held its value over time. In the distant past, gold was a symbol of wealth (for example: a billionaire), and it was utilized in jewelry, decorations, and ceremonies. Currently, gold serves as a "safe investment" against potential financial losses and inflation risks rather than a "store of value."

In addition, gold has special qualities that distinguish it from other commodities and support economic development in numerous nations around the world. These days, gold is employed extensively in many fields such as chemical, electronics, and health.

How is the price of gold determined?

Gold has been used throughout history as money and has been a relative standard for currency equivalents specific to economic regions or countries, until recent times. Many European countries implemented gold standards in the latter part of the 19th century until these were temporarily suspended in the financial crises involving World War I. After World War II, the Bretton Woods system pegged the United States dollar to gold at a rate of US$35 per troy ounce. The system existed until the 1971 Nixon Shock, when the US unilaterally suspended the direct convertibility of the United States dollar to gold and made the transition to a fiat currency system. The last major currency to be divorced from gold was the Swiss Franc in 2000 (Richard, Rudiger and Robert, 2012).

There are many factors that contribute to the formation of the gold futures price statistical moments. Specifically, industrial use, jewelry use, investment use and purchases by the central banks are factors that affect the demand of gold, while the supply is influenced by the quantity being extracted from gold mines, the refining of recycled gold, the currentmarket price of gold and the interest rates.

2.2. Effects of oil price

Oil price affects the inflation rate

Some research of Hooker (2002), LeBlanc and Chinn (2004), van den Noord and André (2007), De Gregorio et al. (2007), Blanchard and Gali (2007a), Chen (2009a, 2009b), Clark and Terry (2010), and Fukada (2010) have all focused only on the issue of oil price pass- through into inflation. This is a critical issue for monetary policy implementation, and it is more pertinent now that oil prices are down. Indeed, it is now commonly acknowledged that price stability is one of the fundamental purposes of monetary policy. To accomplish this aim, monetary policymakers must analyze the impact of fluctuations in oil prices on inflation and implement appropriate policies to keep a lid on inflation. Understanding inflation dynamics is especially important now, given many countries' low inflation rates. This trend suggests that a linear, constant coefficient model may be insufficient to explain the impact between oil price variations and inflation rate.

As a result, in order to effectively examine the correlation between oil prices and inflation and study the way this link has evolved in the long run, temporal variation must be taken into consideration. There are many arguments from the authors that this disruption of the link indicates that the interaction between the variables is non-linear, and other specifications, particularly asymmetrical versions, have been proposed to account for this. Mork (1989) and Mork et al. (1994) postulated that establishing two distinct variables for spikes and declines in oil prices can place these specifications into practice. Different authors, such as Atik and Nder (2011), proposed other approaches, such as calculating Markov regime-switching models with high and low inflation phases, or even utilizing a quantile regression framework to evaluate the marginal effect on inflation in the distribution.

Other writers have recommended dividing the the early 1980s data set into two sub- periods on the basis of a structural split, calculating regression analysis over rolling time frames, as well as employing time-varying parameter models to account for time variation. Since the mid-1980s, a general consensus has arisen on the pass-fall through. Under a variety of settings and for a significant number of industrialized nations, the structural breach looks to be durable. Hooker

(2002) found clear evidence of a structural split, with oil shocks which were important contributors to the inflation rate disregarding food and fuel expenses, but thereafter became minor after 1981.

Since the mid-1980s, there have been several hypotheses presented to explain why pass- through has declined, such as Chen, 2009a. Latest data-driven analysis, on the other hand, suggests that the price of oil actually performed a greater significance in the inflationary process since the late 2000s.

Oil price affects the stock market

A sharp increase in the price of oil tends to have the effect, over shorter time horizons, of lowering economic growth forecasts and raising inflation expectations. When there is less optimism over the possibilities for economic development, companies decrease their profit estimates, which has the effect of putting downward pressure on stock prices. In addition, Sergiy, 2022 states that, a rise in the costs of company inputs, in conjunction with a general increase in the price of oil, has a tendency to put pressure on profit margins.

Moreover, at times when oil prices exceed, investors become more uncertain about the prospects for corporate profitability, which can lead to increased equity risk premia. This situation is likely to put downward pressure on stock prices. Normally, the positive effect on stock prices resulting from the decline in real long-term yields that often accompanies an increase in oil prices is outweighed by a combination of these factors. High oil prices, fueled by supply worries, are frequently regarded to be negative for the economy, stifling growth and, as a result, driving stock values lower (Kilian, 2009).

According to prior scholars' findings studying the effect of oil price shocks on the overall economy, only a small number of researches have investigated the effects that oil price shocks have on the stock market. Despite this, very few researches have investigated the negative association that exists between oil price shocks and the performance of the stock market. For example, Jones and Kaul (1996), who conducted the first analysis in this field, discovered that postwar oil price hikes had a considerable negative impact on aggregate stock returns. According to Sadorsky (1999), increases in the price of oil have a significant and detrimental influence on equity markets, and the magnitude of this effect has perhaps been growing from the middle of the 1980s. Both Ciner (2001) and Park and Ratti (2008) get the same result, which is that there is a nonlinear link between oil price shocks and real stock returns, and that this relationship is statistically significant. Ciner (2001) also concludes that this relationship is not linear.

Results for the market as a whole and for individual sectors during times of fluctuations in real oil prices are compatible with the idea that rising oil prices have a negative effect on stock prices, primarily through their effect on investors' anticipation of future corporate earnings. As such, the greater underperformance of the cyclical goods sector may be related to investors' worries that rising oil prices would have a disproportionately negative impact on earnings in this sector, which is the one most closely tied to the economic cycle.

Besides, oil price also affects plenty of other factors.

Firstly, oil price affects Bank profitability. The oil price has a positive and large influence on profitability. This strong result implies that oil prices do affect bank profitability in MENA nations where oil production is heavily reliant. Investment banks are primarily responsible for the considerable impact of oil price shocks. Positive oil price shocks appear to benefit investment

banks the most through boosting economic activity (fee income, start of new investment projects, and cheaper access to money via the wholesale finance market). When country-specific variables are taken into account, the influence of oil prices becomes minor. This means that oil price shocks have little direct influence and that the total impact is mediated through macro factors. Inflation and fiscal policy appear to be the primary macroeconomic determinants of bank profitability (IMF Working Paper, 2020).

Secondly, oil price affects the Airlines industry. Increased prices of oil lead to higher petroleum products and diesel charges, but while energy is one of the most significant expenditures for airline companies, an increase in energy bills is transferred onto the passengers in the form of more expensive traveling tickets. Aviation fuel spending in the U.S. have surged by approximately 30% since the corresponding time the year before, exerting pressure on air travel return on investment. (Niraj and Clifford, 2022).

Third, the price of oil has an impact on plastic recycling. There is an inextricable tie between the cost of producing and recycling plastic to the price of oil. Plastic is made up of several different ingredients, one of which being oil. This means that when the price of a barrel of oil lowers, so does the cost of creating plastic. On the surface, this appears to be a beneficial market move, yet it causes challenges for plastic recycling. Manufacturers will be more willing to invest in virgin plastic rather than recycled plastic if the cost of creating virgin plastic, or plastic that has not been recycled, declines. Virgin polymers become more desirable when costs decline, to the detriment of recycled plastics (Ibrahim, Eric and Ussif, 2021).

Determinants of gold price

According to Sarathadevi (2019), gold price is the most leading indicator for economic growth. The decrease in the price of gold reflects the high level of wealth of a country. The inflation rises, people purchase more gold as a solution to reduce the risk.

Sindhu (2013) did research about the impact of selected factors on the price of Gold. Exchange rate of US dollar with INR, Crude oil prices, repo rate and inflation rate were examined. It is found that there is an inverse relationship between the US$ and gold prices. Whereas, the crude oil prices affected the gold prices, gold prices and repo rates are interdependent. The positive relationship between gold prices and inflation has also been found.

Ibrahim (2014) also determined the determinants of gold prices in Malaysia. This research indicated that there is a negative relationship between inflation rates and exchange rates on gold prices, while crude oil price is positively significant.

Blose (2010) examined the gold prices, cost of carry, and expected inflation by employing unexpected changes in the consumer price index (CPI) and the results indicated that CPI and gold spot prices are independent. The finding suggested that there is a need for building speculated strategies in the bond markets rather than the gold markets. In addition, only the price of gold can not be used to determine market inflation expectations.

Gold plays an integral part of the monetary system as it constitutes the main reserve asset of leading nations' central banks. As documented in different researches, official announcements have a short-lived impact on the spot price. Kitchen (1996) found that there is a positive association between the price of gold and US Federal deficit projections. Research by Christie- David et al.

(2000) indicated that the price of gold depended on the release of Capacity Utilization, Consumer Price Index, Gross Domestic Product and Producer Price Index, Unemployment Rate and Federal Deficit releases. Tandon and Urich (1987) presented empirical evidence that unanticipated changes in US money supply had a positive effect on gold prices.

Gold is a highly liquid asset. Whether you are a new or experienced investor, investing in gold is always considered quite attractive. Research by Tripathy 2016 indicates that people invest in gold in all economic situations of society. Also from this study, through the Granger Causality test, there is no interaction between the gold market and the stock market in the short term. However, when looking at the long-term, we can see the relationship between these two markets, so to diversify a portfolio, we need to look at the price of gold and the price of stocks together. From Afsal and Haque's study (2016), the impact of stock prices on gold prices is non-existent. In addition, investors need to consider carefully to choose the least risky portfolio because it is not possible to say with certainty that the return can offset the risk in the gold market.

Besides some economic factors, we can see that other social factors also drive the gold price. The corona virus was mentioned in the study of Yousef & Shehadeh (2020). The Covid 19 pandemic has severely affected the global economy. Because isolation policies lead to a halt in production and education activities, investors do not put their faith in global economic growth. They tend to invest in a safer place than stocks and that is gold. That led to sharp fluctuations in gold returns.

3. Model Specification and Data

3.1. Methodology

3.1.1. Method used to derive the model

Based on previous research, we can see linear relationships between manufacturing, unemployment rate, trade components and GDP growth rate. Therefore, we build linear functions to test our hypotheses using multiple regression models and the Ordinary Least Squares (OLS) method.

OLS or linear least squares is a method for estimating the unknown parameters in a linear regression model. By using this technique, the sum of squared vertical distances between the answers that were really seen in the data set and those that were approximated linearly are minimized.

When using this method, it is based on basic assumptions of the OLS (Ordinary Least Squares). Consider the 2 variable regression model:

$$\mathbf{Yi = \beta 0 + \beta 1 Xi + ui}$$

1. The regression model is linear in the parameters.
2. X values are fixed in repeated sampling. This also means Xi and ui are uncorrelated.
3. Zero mean value of disturbance ui (E(ui|Xi)=0)
4. Homoscedasticity or equal variance of ui.
5. No correlation between the disturbances (cov[uiuj| Xi,Xj]= E[uiuj|Xi,Xj] = 0)

6. The model is correctly defined.
7. The number of observations must be greater than the number of parameters to be estimated.
8. The X values in a given sample must not all be the same.
9. There is no perfect multicollinearity**.**

3.1.2. Method used to collect and analyze the data

Our group used secondary data collection which is the process of collecting data that is already existing, be it already published in the annual report of each country and World Bank.

To analyze the data, we use quantitative methods which are presented in numbers and apply mathematical calculation to deduce.

Run the STATA software and then regress the model using Ordinary Least Squares (OLS) method for estimating the unknown parameters in the simple linear regression model. Use the

p-value approach to test whether the regression coefficients are statistically significant or not.

3.2. Theoretical model specification

Population regression function:

$$GP_t = {}_0 + {}_1OP_t + u_t$$

Sample regression model:

$$GP_t = {}_0 + {}_1OP_t + {}_t$$

Based on a lot of research we have mentioned in section 1, we can classify those variables as:

- Dependent variable: Gold price ($/toz)
- Independent variable: Oil price ($/bbl)

The fluctuation of oil price is considered as an important factor of the financial market as well as the whole economy. With an inevitable influence of oil price in the exchange rate and inflation rate, we can say that the increase in oil price rainforces a higher rate of inflation (Hooker (2002), LeBlanc and Chinn (2004), van den Noord and André (2007), De Gregorio al. (2007), Blanchard and Gali (2007a), Chen (2009a, 2009b), Clark and Terry (2010)).

Now let's see how inflation affects gold prices, with a high rate of inflation, stock market and bond are no longer a promising investment and people tend to change to commodity markets and as a result, the price of gold is expected to increase.

Our research also aims at analyzing whether oil price drives gold price or not. We expect that the result is consistent with many previous studies (Zhang and Wei (2010), Nawaz Ahmad (2018), Simakova (2011)), oil price and gold price have a strong and positive correlation and the change in price of oil will move that of gold in the same direction.

3.3. Description of the data

Source of data: World Bank

Type of data: Time series data Observations: 35 (1987 - 2021)

The data includes: Oil price ($/bbl), Gold price ($/toz)

With our observations, 35 years from 1987 to 2021, their data is expected to be close to the population. Table 1 shows the descriptive statistics of our variables. The mean gold price is 772.9057$/toz with a quite large standard deviation, showing that the price of gold is very unstable.

Moreover, over 35 years, gold is now a heige of investment in the commodity market and has gone through some remarkable event as well as financial crisis that lead to the boom in its price. Quite the same with gold, oil price moves significantly around its mean, 45.59171$/bbl. The gap between the minimum and maximum price level is very large. Actually, this number is the average of a year, as we know in 2020, sometimes the price of crude oil is below zero, showing that the economy is in a serious situation.

Based on the model, our team will use the Sum statement in Stata to describe the independent and dependent variables, obtaining the results:

Table 1. Statistical description of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Gold price	35	772.9057	513.5815	271.19	1799.75
Oil price	35	45.59171	28.02035	14.42	99.67

Source: Stata

3.4. Results of the model

From the population regression model, we have the following sample regression model:

Gold price = 153.1776 + 13.59302 x Oil price

In STATA, by using ***reg* GP OP**, we have result as below:

Table 2. The Regression Results

Source	SS	df	MS	Number of obs	35
				F(1, 33)	40.33
Model	4932395.13	1	4932395.13	Prob > F	0.0000
Residual	4035648.92	33	122292.391	R-squared	0.5500
				Adj R-squared	0.5364
Total	4.32883787	199	.021752954	Root MSE	349.7

GP	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
OP	13.59302	2.14036	6.35	0.000	9.238426	17.94761
cons	153.1766	114.0896	1.34	0.189	-78.94049	385.2937

Source: Stata

Depending on the results shown in table 2, we can conclude that oil price and gold price have a statistical relationship. If the price of oil increases by $1/bbl, the gold price is expected to increase by $13.59302/toz. It is a significant and positive correlation between the price of two main goods of the commodity market.

The correlation coefficient equal to 0.55 means that oil price is expected to explain 55% of the sample variation of gold price. This result is consistent with many previous researches mentioned above and also consistent with our predictions.

However, with the result generated by this model, we can only see the correlation between the price of oil and gold, that is, oil price can be considered as a determinant of gold price.

4. Opportunities, challenges and Recommendation for Vietnam

4.1. Opportunities for Vietnam

4.1.1. In terms of the oil sector

Throughout these years, Vietnam's oil industry has been on the rise. Despite regular ups and downs, this industry still has some future potential.

According to ANT Consulting (2019), in terms of crude oil and gas output, Vietnam ranks third in Southeast Asia and 31st globally. Twenty commercial fields have been developed among the 50 field structures with proven oil and gas reserves. Vietnam has proven oil reserves of 600 million barrels. Crude oil price is forecasted to increase stably until 2023, this will create more favorable conditions for Vietnam's oil and gas economic-construction projects, helping economic-economic investment activities to recover in drilling.

On the other hand, a stable increase in oil price, leading to an increase in gas prices (many gas sources are priced based on the price of crude oil/oil products) will create a driving force for the development and exploitation of gas resources, promoting the development of gas resources. gas industry field project (transportation, treatment). The application of new technologies (in drilling, geophysics) will promote oil and gas exploration and production in new conditions (for deepwater areas, offshore areas, marginal fields); the application of EOR technology to improve the oil recovery coefficient will increase oil and gas production output and make full use of natural resources; floating GTL technology will support the collection and transportation of gas for the development of small-scale gas fields; application of deep processing technology will increase the value of petrochemical products. The application of new technologies will bring many benefits, but requires large investment costs and potential risks because it depends on the selection of appropriate technology/methods, the time of application and must take into account the effectiveness of economic results from the investment project (ALBRECHT & partners, 2014)

4.1.2.In terms of the gold sector

The year 2021 has witnessed strong fluctuations in the world of gold price, when opposite factors simultaneously affected the market. In addition to international market developments, the gold market in Vietnam is also influenced by policies and the situation of supply and demand in the country.

Investors went to gold as stock market volatility increased, particularly in the US and Europe. Closer to home, the real estate market in Vietnam shrank in the face of uncertainty. The traditional sanctuary had attained its full potential. Due to its long-term stability and worth,

Vietnamese investors began purchasing gold. However, some others saw an increase in prices and seized the chance to sell.

With the mentality of not putting all eggs in one basket, gold is still an indispensable investment channel, a multi-asset investment channel. Although gold market is facing fierce competition against the strong growth in the real estate market and the liquidity in the stock market, gold price in Vietnam reached a record level at over VND 61 million ($2,677.51) (November 16, 2021), which means there existed VND 9.8 million gap between Vietnamese and the global gold rate (SJC, 2021). Gold is also being competed by the cryptocurrency market, with the most dramatic breakout in the name of bitcoin. Regarding the prospect of the gold market entering 2022, investment in gold is expected to continue to increase in the coming time; in which inflation is an indispensable factor when investing in this product.

Inflation is appearing globally, Vietnam is no exception when a large amount of money is pumped out during the epidemic period. At this time, gold is a defensive asset that investors use to hedge commodity prices and preserve assets. Analysts also said that the outlook for this product line depends on the movement of monetary policy and the impact on the USD along with the ability to control disease in the world.

Subsequently, the instability related to the Omicron variant may lead central banks of countries to support a more easing monetary policy in 2022, thereby supporting gold prices. Senior market strategist at RJO Futures, 2022 will definitely benefit gold prices, especially as high inflation is likely to continue (Pavilonis, 2021).

Still, some experts warn gold's reputation as a reliable hedge against inflation is at risk, as investors find other sectors of the market can help them avoid impact from rising prices.

4.2. Challenges for Vietnam

4.2.1. In terms of the oil sector

The oil and gas industry in general and the Vietnam Oil and Gas Group (PVN) in particular are going through a difficult period in the history of construction and development. In addition to the internal limitations of PVN, the trend of international economic integration, global energy transition for sustainable development, technological development, unpredictable political developments have and will create new challenges, new opportunities but also potential risks and challenges for oil and gas activities.

Commitments on tariff reduction in FTAs: create competitive pressure on domestic products with imported goods in terms of price and quality, typically oil refining products. In 2016, the ATIGA agreement and the VN-HQ agreement came into effect, the petroleum importers have shifted to importing from FTA signatories. From 2015 to 2017, imports from Malaysia, Singapore and South Korea increased from 4.9 million tons to 10 million tons (in terms of the share increasing from 50% to 66% of total imports) (according to World Trade Statistical Review of WTO, 2019). That shows that petroleum businesses are very "sensitive" to choosing cheaper sources of supply. Meanwhile, the balance of petroleum supply and demand of many countries in the period to 2035 shows that Oversupply will happen in many countries around the world, especially the countries that Vietnam is still importing. With the oversupply situation, while many factories have exhausted their depreciation, the risk that these countries will use trade protection measures "dumping" is inevitable, leading to more intense competitive pressure between the two countries. prices of imported petroleum and domestic refined petroleum products.

Climate change and renewable energy: The requirements for fuel product quality in the environmental protection criteria in recent times have also changed very rapidly, which can be said to be extremely harsh. Climate change is at the heart of the global oil and energy industry. Temperatures in many parts of the world have been recorded at record highs in recent years. Disasters such as large-scale forest fires in Australia in 2019; heatwave in Antarctica with March 2020 temperature up to 18.3oC as well as unprecedented salinity in the Mekong Delta, Vietnam... making the world unable to stand look. Pressure on oil and gas companies comes not only from environmentalists but also from the financial markets: the number of institutional investors that have pledged to cut investment in fossil fuels has increased. increased from 180 in 2014 to 1,000 in 2019 (Nauman, 2019). Along with that, the rapid and impressive growth of alternative and renewable energy put more pressure on petroleum products, even in the transportation sector.

4.2.2. In terms of the gold sector

The gold market has been one of the most often used alternate avenues for investor worries throughout the most recent economic slump in Vietnam, with its frozen real estate market and underdeveloped stock market. Due to this, many Vietnamese view dealing in gold and U.S. dollars as a safe haven from inflation and other economic difficulties.

The gold selling and purchasing rates were advertised at VND55.1-55.5 million (US$2,382-2,400) by Saigon Jewelry Company (SJC), the country of Vietnam's leading producer and distributor of gold and gold jewelry. Because of this, domestic gold prices last week decreased by VND700,000 ($30.27) from the week before.

A tael is 37.5 grams or 1.2 ounces, and the world gold price declined as a result, reaching a nine-month low of US$1,695, or VND47.2 million (US$2,041) per ounce.

The Covid-19 vaccination roll out was connected by HYCM's chief currency analyst Giles Coghlan to the current trend of selling off gold. Meanwhile, a rise in Bitcoin's price (which has surpassed US$50,000) and the price of crude oil on the international market, which has reached around US$61 per barrel, has been enticing investors into the cryptocurrency and oil markets.

Similar dynamics to those of 2021 are anticipated for gold in 2022, with opposing pressures bolstering and limiting its performance. In the near future, real rates are expected to impact gold prices, which in turn will impact how quickly global central banks tighten monetary policy and how well they are able to contain inflation.

4.3. Recommendations in the context of the Covid pandemic

4.3.1. In terms of the oil sector

We find that there is a new chance for Vietnam's oil sector. To achieve the potential and sustainable development, it is necessary to pay more attention to the promotion, exploration activities. Therefore, it is recommended that:

Firstly, there is a need to attract more investment. According to the Vietnam Oil and Gas Association, the difficulty faced is the deficit in resource for exploration activities, and reduction in reserve and production. At the same time, the increasing cost in exploration, operation and complicated security developments in the East Sea are also the risky objections for the investment decision.

Secondly, the short-term and mid-term measures should be applied. Petrovietnam should improve the technique of the plans, which helps to maximize utility and ensure consumption from Vietnam Electricity. A change in the regulations for profit division is also emphasized, which create the long-term relationship between the states and foreign investors.

Thirdly, the process of risk management and progress decarbonisation should be monitored carefully. There is a demand for higher level of regulations by corporate governance, responsibility by society. In addition, the path to an effective energy transition is explored. To ease the pressure of debt risk management, oil companies change to achieve diligence, transparency and accountability in each step of the process.

Fourthly, having positive statistics in sales and converting to national government budgets: Meet the better management of risks at the national level by applying transparent and rigid policies to regulate the situations, which promote the development of oil production.

4.3.2. In terms of the gold sector

According to the World Gold Council's Asia-Pacific region, Vietnam reigns supreme in terms of gold consumption in Southeast Asia. Vietnam's entire gold demand in 2021 is estimated to be 43 tons, up 8% from the previous year. In Vietnam, gold is used as both a currency and a form of storage, and it is sometimes more valuable than paper money. Throughout history, gold has held a unique place in the hearts of the Vietnamese people, and it has been widely utilized for investment and as an alternate payment method for cash in significant transactions. In recent years, gold has also been utilized as a hedge against inflation and the global economic downturn. In particular, if the Omicron variant is as devastating as its predecessors, investors may once again look to gold as a safe-haven asset. These are the main reasons why Vietnam's gold market has been identified as having exceptional potential in Asia. So as to stabilize the gold price and maximize the revenue from purchasing activities, there would be some practical recommendations:

Setting an annual goal to stabilize the gold market in order to reduce speculation and, as a result, improve the stability of money demand and the monetary market.

- To begin, governments must stay vigilant to market fluctuations in gold prices in order to take consistent actions, such as deploying national gold reserves to keep the market stable

- Furthermore, market monitoring authorities shall enforce punishment rules for gold market bluffers and speculators, who might be considered a type of financial crime.

- Finally, officials must stabilize inflation and lessen the volatility of the real exchange rate, as well as undertake measures helping sustain the market of gold, and thereby the domestic macroeconomic environment.

Introducing new methods of commodities market on digital platforms, including the use of business technology to invest in gold online. It is simpler for customers to acquire and sell these commodities without having to visit physical establishments, limiting interaction and making it more difficult to conduct epidemic preventive measures. These options are available to businesses:

- Developing an application that enables investors to accumulate and trade gold and gold jewelry products through a digital platform. This helps them save time and increase convenience compared to having to go to an offline store with a high risk of direct contact with the source of

the disease. Because all transactions conducted through this format include real money and genuine gold, safety and transparency are absolutely guaranteed for investors.

- Expanding the service of online gold bar trading, allowing customers to store gold online in parallel with the traditional gold custody service system at the counter, guaranteeing a system of vaults, safes, and security up to the standards prescribed by the State Bank.

Conclusion

In this paper, we examine the causal relationship between oil price and gold price. For many years, oil has always been considered as a main factor of the whole economy, as it directly influences the price level and then causes the inflation rate to fluctuate. The oil supply affects the whole economy, and the role of OPEC is undeniable. According to numerous previous research, the interaction between gold and price is very hard to analyze as there are many other factors that need to be considered. However, in the scale of this paper, we only want to examine whether there is a co-movement between the price of the two variables. The result generated by data has proven that, when we look into the average world's price level, it is quite clear that oil and gold move in the same direction, if the price of oil increases by $1/bbl, the gold price is expected to increase by $13.59302/toz. Now, let's take a look into the case of Vietnam, a developing country. Of course, we are strongly affected by the change in the world's price level, of almost all kinds of goods. And according to our findings, oil price and gold price also move in lockstep in Vietnam's market, which means that the hypothesis is accepted at the nation's level. However, we still can say for sure that oil price can become the main determinant that can be used to predict gold price. In each market, we need to take into account many other things that appear with the scale of national's level and therefore the interaction between oil and gold will be affected as well.

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