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Analysis of Economic Growth, Oil Stocks and SIN Stocks in United States

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ABSTRACT

This study aims to examine whether oil stocks can affect US gross domestic product (GDP) more than sin stocks. Because if oil stocks can increase GDP growth in America, America can reduce the sin stocks that tends to be controversial in society. The data in this study use GDP growth, stock price returns on oil stocks and sin stocks in the United States. Data obtained through the World Bank and Reuters in the form of annual data from 2000 to 2017. There are 9 oil companies and 8 sin companies engaged in the alcohol, gambling and tobacco sectors. The data used is time series data. The results of the analysis are that each type of stock has different characteristics. Not all types of stock affect economic growth in a country. In this study, oil stock has no influence on the economic growth of the United States, even though the United States is the largest oil producer in the world. While the sin stocks which is considered an immoral stock actually has a big influence on the economic growth of the United States. Where, the United States also has the largest sin stock in the world.

Keywords: Economic Growth, Gross Domestic Product, Oil Stock, Sin Stock

JEL Classifications: O13, O47, Q43

1. INTRODUCTION

America as a superpower because this country has more power than other countries in the international political arena, both in influencing global events and decision making in international projects. Until now, America is still recorded as the country with the largest economic power when viewed from the value of its gross domestic product (GDP) which reached US \$20,544.34 billion in 2019 with growth of 2.3%. The GDP was obtained from the agricultural sector of 243 billion, construction of 651 billion, manufacturing 2190 billion, mining of US \$549 billion, public administration of US \$2212 billion, services of US \$13,201 billion, transportation of US \$559 billion and utilities of US \$283 billion (tradingeconomics.com). According to Mankiw (2003) GDP is the main measure in seeing a country's economic growth.

Based on GDP according to each of these industries, the mining sector only accounts for 2.7% of total GDP. Even so, America is the largest oil producing country in the world. After 45 years in the oil industry, America has become the largest oil producer in the world. With an achievement of 15,311,000 bbl/day in 2018, so far America has succeeded in surpassing Saudi Arabia which produces 12,287,000 bbl/day. In 2019, the volume of American oil exports will reach 3.4 million barrels/day, above Canada's 3.3 million barrels/day. However, the volume of American exports is still below Iraq which reached 4 million barrels/day, Russia 4.5 million barrels/day and Saudi Arabia which reached 6.7 barrels/day.

The biggest contributor to US GDP is the service sector, which is 66%. Therefore, oil companies in the United States develop wings by selling their shares to the market in order to get value added from the price earning ratio and price to book value.

Therefore, a company that has a good reputation will get the trust of investors. By selling company shares to the market, you can get more profit and increase equity. Therefore, many oil companies in America have begun to go public in the hope that the go public oil companies can contribute a greater percentage than if they were only in the mining sector.

In addition to oil companies, sin companies also play a role as the largest contributor to GDP in America. The company consists of alcohol, gambling, tobacco, weapons, cannabis, and sex. Companies engaged in these fields are said to be sinful because there are pros and cons in doing business in the eyes of the public. Even so, it is undeniable that these companies have contributed to the gdp in America until the service sector can occupy the top position. The vice fund in 2002 focused on this sin stock because this stock was very prominent (Troberg, 2016). This stock is so prominent for 5 reasons, first, because of Natural barriers to new competition, second, because of steady demand regardless of economic conditions, third, global marketplace - not limited to the US economy, fourth, potentially high profit margins and finally ability to generate excess cash flow and pay and increase dividends (USA Mutuals, 2016).

This study aims to examine whether oil stocks can affect US GDP more than sin stocks. Because if oil stocks can increase GDP growth in America, America can reduce the sin stocks that tends to be controversial in society.

2. LITERATURE REVIEW

United States of America is a superpower country by mastering many things, especially in the economic sector. Crude oil production in the United States is currently the largest in the world. However, the country's growth as seen from the GDP level, through crude oil production is only 2.7%. Although only 2.7% of the oil sector can affect the US economy due to volatility in oil prices. The instability of oil prices which is also affected by trade war among countries can affect the economy of that superpower country (Difiglio, 2014). Therefore, the oil sector is always interesting to study.

The object of this study is oil stocks because the country's largest growth is contributed by the service sector at 66%. The service sector includes the capital market. The capital market is one indicator of a country's economy (Tang et al., 2007). The stronger the capital market in a country, the more advanced the country's economy can be said. Conversely, a weaker capital market in a country can be said to be a developing country or even a poor country. Because, if the country is advanced, many investors will enter the country to invest their capital. Even though the United States is the world's largest oil producer, the United States continues to prioritize the capital market as the country's main income, which accounts for 66% of economic growth. Therefore oil stocks are preferred over oil prices.

In addition, something interesting in the US capital market is its sin stock. The US is also known as the owner of the largest sin stock in the world. Sin stock is a company stock in an industry that some

people consider unethical or immoral, including alcohol, tobacco, and gambling (Royal, 2018). Sin stock sounds sexier than other stocks. Why is sin stock attractive? Because companies in this industry often face additional taxes or regulations (Salaber, 2007). Tobacco products for example are subject to special excise taxes, and many countries require a more controlled distribution system for alcohol products. Similarly gambling is often limited to certain geographical areas and requires special licenses. The gambling area is restricted and controlled by a variety of strict regulations such as taxes and permits. The state usually issues a limited number of gambling licenses, which keep many competitors from entering the market. Tiered alcohol distribution systems in many countries can also limit the competition. Less competition can make this industry more profitable for the remaining players. Besides that, alcohol and tobacco are recession-resistant, which people buy regardless of the economic climate. This tends to keep profits stable, allowing companies to pay large amounts of dividends. Altria, for example, has treated investors with an average annual return of 20% since 1968 while continuing to increase dividend payments. A surprising record for the business world. The giant cigarette Diageo has produced an annual return of better than 10% over the past 10 years and paid almost 40% of the purchase price in cash dividends. Facts like this make stock returns "sin" attractive to investors.

According to previous studies, sin stock is attractive because it has a high return due to high risk (high litigation and excise risk) (Salaber, 2007). Sin stock has a high interest, even though it is contrary to social and ethical issues (Salaber, 2009). This is because investments in sin stocks have high returns (Hong and Kacperczyk, 2007). Another thing becomes the reason why investors like these stocks is that investors want a return that is more than this sin stock because of legal risks, especially related to taxation, have not been included in abnormal return estimation procedures such as Fama and France (1993) or Carhart (1997). Besides the United States (Hong and Kacperczyk, 2007), Salaber (2007) revealed that in European capital markets, sin stock has its own appeal because of the high risk of giving a high return. In addition, Visaltanachoti et al. (2009) found that Sin stock is a dominant stock in the stock market in Shanghai and Shenzhen stock exchanges, and the Hong Kong stock exchange.

Therefore, this study provides its own attraction in examining and comparing oil stocks and sin stocks, which stocks are more influential in the level of economic growth in the United States as measured by the level of GDP. The study, which specifically compares oil stocks and sin stock to GDP levels in the United States, is the first study that has never been studied before. With reference to the previous studies conducted separately.

3. DATA AND METHOD

3.1. Data Collection

The data in this study use GDP growth, stock price returns on oil stocks and sin stocks in the United States. Data obtained through the World Bank and reuters in the form of annual data from 2000 to 2017. There are 9 oil companies and 8 sin companies engaged in the alcohol, gambling and tobacco sectors. The data used is

time series data.

3.2. Measure and Scale of Variables

The GDP variable is calculated using the formula $C + I + G + (X - M)$, where C is consumption, I is the investment, G is the state expenditure, X is the export and M is the Import. Variable oil stocks and sin stocks are obtained from stock price returns calculated using $(\text{Stock Return} = (P_t/P_{t-1}) - 1)$. Where P_t is the stock price at time t , P_{t-1} stock price at time $t-1$.

3.3. Model Specification

The model specified in equation 1 and 2 is used to express the relationship between variables:

$$GDP = \beta_0 + \beta_1 OIL + \varepsilon_1 \quad (1)$$

$$GDP = \beta_0 + \beta_1 SINstock + \varepsilon_2 \quad (2)$$

Where,

GDP : Gross Domestic Product

OIL : Oil stock

$SINstock$: Sin Stock

3.4. Method of Data Analysis

This research uses an explanatory analysis. The test is a time series regression testing using Eviews 10. Stages in processing data through the classical assumption test, after the classical assumptions are met, a new regression analysis can be run.

The classic assumption test used in this study consists of:

1. Multicollinearity test ($VIF < 10$)
2. Autocorrelation test (Probability $> 5\%$)
3. Normality test (Probability $> 5\%$)
4. Heteroscedasticity test (Probability $> 5\%$).

4. RESULTS AND DISCUSSION

4.1. Descriptive Analysis

Descriptive analysis will be explained for the dependent variable. The dependent variable in this study is gross domestic product.

In the Figure 1 shows that there was a sharp decline to the minus figure in US GDP in 2008. This is because in that year the United States experienced a crisis that caused a global crisis. The crisis has a serious impact on US GDP.

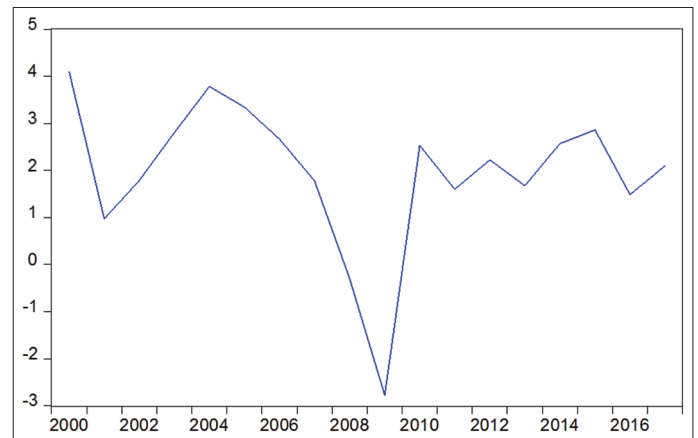
4.2. Assumptions Classic Test

Testing classic assumptions in this study consisted of multicollinearity test, autocorrelation test, normality test and heteroscedasticity test. Next, an explanation of the results of the classic assumption test is as follows.

4.2.1. Multicollinearity test

Multicollinearity is a state in which a perfect or close linear relationship occurs between independent variables in the regression model. The results are difficult to find the effect between independent and dependent variable. How to find out the presence or absence of multicollinearity symptoms, among others, by

Figure 1: Flow chart GDP US



identifying several variables that have a high correlation with a correlation value above 10. If there is a correlation value above 10, then between variables multicollinearity occurs.

Multicollinearity test results in the Table 1 can be seen in the Centered VIF column table. The VIF value for all stocks, both oil stocks and sin shares, varies in size but is < 10 . Therefore, it can be said that there is no multicollinearity in these variables. Based on the classical assumptions of linear regression with OLS, this linear regression model is good because it is free from the presence of multicollinearity.

4.2.2. Autocorrelation test

Autocorrelation test is a test conducted to find out whether there is a correlation between variables. In testing using time series data, this test must be done.

In the Table 2, Prob value. $F(2.6)$ in oil stocks is 0.719 and prob value. $F(2.7)$ on SIN shares of 0.9541 can also be referred to as the calculated F probability value. The value is greater than the alpha level of 0.05 or 5%. So based on these results autocorrelation does not occur. This means that the fulfillment of the classical assumptions of the regression model is good to proceed.

4.2.3. Normality test

The normality test in question is the residual formed by the normally distributed regression model. This test uses the Jarque-Bera test.

The normality test results in the Figure 2 shows that the probability of Jarque Bera is greater than 0.05. Jarque fallow on oil stock 0.609171 and sin stock 0.924389. Then it can be concluded that the residuals are normally distributed. So it can be concluded that the classic assumptions about the normality test have been fulfilled.

4.2.4. Heteroskedasticity test

Heteroscedasticity occurs when residuals and predictive values have correlations or relationship patterns. This pattern of relationship is not only limited to linear relationships but in different patterns it is also possible. The decision whether heteroscedasticity occurs or not in the linear regression model is

to look at the value of Prob. F-statistic (f-count). If the f count is greater than 0.05, heteroscedasticity does not occur.

The heteroscedasticity test results in the Table 3 have a value of 0.0748 in oil stock and 0.5372 in sin stock. This means that heteroscedasticity does not occur.

In testing the classic assumptions above obtain results that this test has been met and both models have been fit and can be continued to test linear regression analysis.

4.3. Regression Analysis

The estimation results in Table 4 below are the results of regression analysis.

The results obtained from Table 4 are regression analysis tests that there are no oil stocks in the United States that affect GDP

growth in the United States. In the 9 stocks studied, there were no oil stocks that affected GDP growth in the United States. With R^2 0.491087, that means only 49.1% of GDP. Similarly, the oil sector contributed only 2% to GDP growth. Although the oil sector has issued most of its shares to the market, however, the effects associated with oil stocks on GDP are minimal. Though the US is the largest oil producer in the world. This is because oil is not the only source of state income in the US. This study is the first study to be conducted on oil stocks, because the previous study was conducted using oil prices.

While oil stocks have no influence on US GDP, sin stock is different. From the test results on Table 4 above, the stock of sin has a significant positive effect on US GDP. In 8 sin stock companies consisting of alcohol, gambling and tobacco companies have a significant influence on GDP growth in the US. With $R^2 = 0.926307$ which means that the stock of sin has an influence of 92.6% on

Figure 2: Normality test OIL and SIN stock

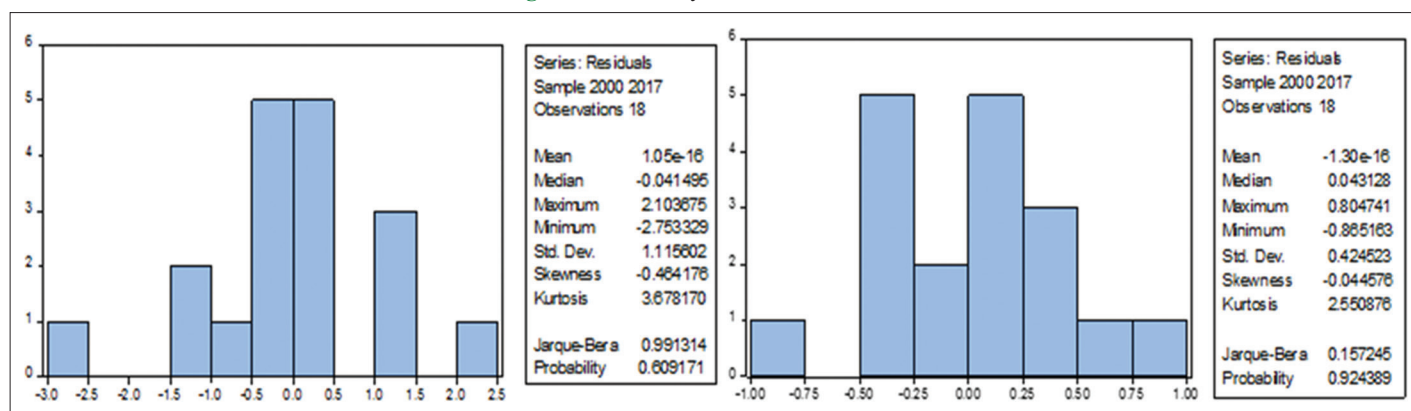


Table 1: Multicollinearity test

OIL stock				SIN stock			
Variable	Coefficient	Uncentered	Centered	Variable	Coefficient	Uncentered	Centered
	variance	VIF	VIF		variance	VIF	VIF
C	0.407682	2.774702	NA	C	0.068349	3.614068	NA
CRT	545.9750	2.826919	2.410717	BYD	55.62680	9.413192	8.451107
DO	250.0224	2.048443	1.983053	CHDN	193.8001	4.094773	2.071034
GIFI	285.2547	2.112389	1.818602	CNTY	45.97227	6.509806	5.906442
HP	1393.529	8.145969	6.107422	ERI	1.454349	1.177680	1.150655
NBR	746.7792	6.717695	6.717618	FLL	4.107165	2.116052	1.887670
NE	863.5715	5.020942	5.018425	IGT	42.11976	3.246053	3.006126
PTEN	993.4547	5.914708	5.467657	MCRI	60.37696	5.521215	4.109114
RIG	526.7979	5.022976	5.022976	SWM	37.95218	2.630108	2.268103
SWN	4710.590	2.057966	1.998186				

Table 2: Autocorrelation test

Breusch-Godfrey serial correlation LM test OIL stock				Breusch-Godfrey serial correlation LM test SIN stock			
F-statistic	0.348271	Prob. F (2,6)	0.7193	F-statistic	0.056886	Prob. F (2,7)	0.9451
Obs*R-squared	1.872272	Prob. Chi-square (2)	0.3921	Obs*R-squared	0.287877	Prob. Chi-square (2)	0.8659

Table 3: Heteroskedasticity test

Heteroskedasticity test: Breusch-Pagan-Godfrey OIL stock				Heteroskedasticity test: Breusch-Pagan-Godfrey SIN stock			
F-statistic	2.892055	Prob. F (9,8)	0.0748	F-statistic	0.926933	Prob. F (8,9)	0.5372
Obs*R ²	13.76825	Prob. Chi-Square (9)	0.1308	Obs*R ²	8.131254	Prob. Chi-Square (8)	0.4208
Scaled explained SS	3.641849	Prob. Chi-Square (9)	0.9334	Scaled explained SS	1.576321	Prob. Chi-Square (8)	0.9914

Table 4: Regression analysis

GDP and oil stock					GDP and SIN stock				
Variable	Coefficient	Standard error	t-Statistic	Prob.	Variable	Coefficient	Standard error	t-Statistic	Prob.
C	2.018620	0.638499	3.161506	0.0134	C	1.588263	0.261436	6.075142	0.0002
CRT	23.87282	23.36611	1.021686	0.3368	BYD	36.25893	7.458338	4.861529	0.0009
DO	-10.24904	15.81210	-0.648177	0.5350	CHDN	31.43544	13.92121	2.258097	0.0503
GIFI	-2.863336	16.88949	-0.169534	0.8696	CNTY	19.50991	6.780285	2.877447	0.0183
HP	-10.86340	37.33000	-0.291010	0.7784	ERI	8.333938	1.205964	6.910603	0.0001
NBR	8.278692	27.32726	0.302946	0.7697	FLL	5.997464	2.026614	2.959352	0.0160
NE	-23.57029	29.38659	-0.802076	0.4457	IGT	19.00364	6.489974	2.928154	0.0168
PTEN	-29.91179	31.51912	-0.949005	0.3704	MCRI	16.08509	7.770261	2.070083	0.0684
RIG	17.68245	22.95208	0.770407	0.4632	SWM	22.25442	6.160534	3.612418	0.0056
SWN	148.4627	68.63374	2.163115	0.6250					
R-squared	0.491087	Mean dep	1.956527		R-squared	0.926307	Mean dep	1.956527	
Adj R ²	-0.081440	S.D. dep	1.563823		Adj R ²	0.860802	S.D. dep	1.563823	
S.E. of reg	1.626255	Akaike info	4.110618		S.E. of reg	0.583451	Akaike info	2.067139	
Sum ² Resid	21.15765	Schwarz	4.605269		Sum ² Resid	3.063732	Schwarz	2.512325	
Log like	-26.99556	Hannan-Q	4.178823		Log like	-9.604252	Hannan-Q	2.128524	
F-statistic	0.857754	Durbin-Wat	2.035701		F-statistic	14.14102	Durbin-Wat	1.943153	
Prob (F-statistic)		0.591231			Prob (F-statistic)		0.000297		

US GDP. This provides answers to researchers questions that the United States is the country with the largest sin industry in the world because the sin stock is interesting to trade and develop compared to oil stocks. Therefore, although the US has become the world largest oil producer, the US continues to develop the pros and cons of the sin industry, because the sin industry is very profitable for US GDP growth.

In accordance with previous studies conducted by Salaber (2007), Hong and Kacperczyk (2007), Salaber (2009) who showed empirical results that stockpiles produced returns that were adjusted for abnormal risks when compared to industries with similar characteristics. It is proven that sin stock still outperformed the market as a whole during difficult times. This means that socially responsible investors pay more financial fees when avoiding these shares due to social and ethical criteria. The uniqueness of the sin stock is because of the addictive nature of the consumption of sin, they are only as evidence of a recession like some other similar industrial stocks. According to the results of research conducted by Troberg (2016) sin stock is a stock that is quite stable against market fluctuations, his research was conducted on the European stock market. According to him, the stock of sin is quite resistant to recession and immediately recovers when the market is corrected.

Visaltanachoti et al. (2009) found similar results in his research in China and Hong Kong, that Sin stocks are superior in the stock markets in China and Hong Kong. In another narrower study only online gambling found positive results and returns that were in line with the risks (Davis and Sikes, 2002; Olsson, 2005; Salaber, 2007; Fabozzi et al., 2008). As well as Goodall, (1994), Chen and Bin (2001), and Olsson (2005), Liston and Pineda (2019) found that sin stocks showed the same movement as the stock market.

In contrast to the results of these studies, some researchers get very different results. Like Lobe and Walkshäusl (2011) who get a significant but negative affect. Humphrey and David (2014) got results that did not significantly influence. Fabozzi et al. (2008) and Durand et al. (2013) find results that have very little impact.

This might happen because the data studied in each country and time are different.

5. CONCLUSIONS AND SUGGESTIONS

The conclusion obtained from the results of the analysis above is that each type of stock has different characteristics. Not all types of stocks affect economic growth in a country. In this study, for example, oil stock does not affect the economic growth of the US, even though the United States is the largest oil producer in the world. While sin stock which are shares in companies that are considered immoral actually have a great influence on the economic growth of the United States. Where, the United States is also listed as a country that has the largest sin company in the world. This is an answer to the researchers question why the United States still maintains sin stocks even though it has become the world largest oil producer and sin stock is immoral stocks. This is because sin stocks are more profitable and affect the economic growth of the United States through the GDP growth.

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