

## An Investigation into How Fluctuations in Global Crude Oil Prices Impact Tadawul All-Shares Index (TASI) (January 1995-December 2017)

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**Abstract:** This paper investigates the effect of fluctuations in the global oil market on the movement of the TADAWUL All Shares Index, TASI, by using monthly data for the period between January 1995 and December 2017. To capture the impact of the global oil market, this paper uses the two main benchmarks in the global oil market, West Texas Intermediate (WTI), and Brent Crude oil. As the stock market is known to be stochastic, a set of secondary explanatory variables is added to this research. It consists of the following: inflation rates, short-term interest rates, gold spot prices, level of imports, level of funds invested in private securities by the private sector, and proxy for global equity markets, FTSE 100. The FTSE 100 has a significant impact on the TASI index, the coefficient is close to 1. The significant impact of the FTSE 100 on the TASI index could signal the existence of many dual investors in both indices. The results show that all variables have an impact on the TASI index at a statistically significant level. Despite the positive impact of spot prices on both benchmarks, the futures strip curve for both benchmarks are inversely related to the predicted variable. Also, the TASI index is more exposed to changes in the WTI than changes in Brent Crude. It is clearly shown in the coefficient values, .359 and .302, for WTI and Brent Crude respectively. Moreover, over the sample period there is an increase in the level of the explained variation in the TASI index by the explanatory variable. This would indicate that TASI has become a less speculative and more sophisticated market. Finally, as this paper provides evidence for the impact of the global equity market on TASI, it would open a window for future research to examine the impact of other international equity markets on TASI.

**Keywords:** TASI, WTI, BRENT Crude, Oil Futures, REOP Rate,

### دراسة بحثية عن تأثير التغيرات في أسواق النفط العالمية على المؤشر الأساسي لسوق الأسهم السعودية ( تاسي ) يناير 1995 – ديسمبر 2017

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**المستخلص:** تهدف هذه الدراسة لبحث أثر التقلبات في أسعار النفط العالمية ( الفورية و العقود الآجلة ) على المؤشر الأساسي لسوق الأسهم السعودية ( تاسي ) و الذي تم اعتباره كمتغير تابع في هذه الدراسة أما المتغيرات المستقلة في هذه الدراسة شملت الأسعار النقدية الفورية و العقود الآجلة للخام العربي الثقيل و الخام الأمريكي الخفيف. أيضا شملت الدراسة على مجموعة من المتغيرات المستقلة الثانوية التي تتكون مما يلي: معدلات التضخم ، أسعار الفائدة قصيرة الأجل ، أسعار الذهب الفورية ، مستوى الواردات السعودية ، مستوى الأموال المستثمرة في الأوراق المالية الخاصة عن طريق القطاع الخاص، و مؤشر لأسواق الأسهم العالمية FTSE100. و تم إجراء هذه الدراسة باستخدام البيانات الشهرية في الفترة من يناير 1995 إلى ديسمبر 2017، و قد أظهرت النتائج الاحصائية لهذه الدراسة وجود علاقة ايجابية بين التغيرات في الاسعار النقدية الفورية لكل من مزيج الزيت الثقيل و الخام الامريكي الخفيف و التغيرات في مؤشر سوق الأسهم السعودية. أما بالنسبة للتغيرات في العقود الآجلة فكان لها تأثير سلبي على المؤشر. وأوضحت الدراسة أن التغيرات في أسعار الخام الأمريكي الخفيف أكثر تأثيراً على تاسي من التغيرات في أسعار الخام العربي الثقيل، و يظهر ذلك في قيمة المعامل لكل منهما 0.359 و 0.302 على التوالي. و أيضا أظهرت الدراسة وجود تأثير للمتغيرات الثانوية (معدلات التضخم ، أسعار الفائدة قصيرة الأجل ، مستوى الواردات السعودية ، مستوى الأموال المستثمرة في الأوراق المالية الخاصة عن طريق القطاع الخاص، و مؤشر لأسواق الأسهم العالمية FTSE100) على المؤشر بإستثناء أسعار الذهب و كان للمؤشر العالمي FTSE 100 أثر ملحوظ على التغيرات في مؤشر تاسي حيث أن معاملته كان قريبا من 1 و هذا التأثير قد يشير إلى احتمالية وجود مستثمرين مشتركين بين هذين المؤشرين، و بالتالي يمكن النظر إلى هذه النتيجة كعامل محفز لإجراء دراسات مستقبلية تدرس أثر الأسواق العالمية الأخرى على المؤشر الرئيسي للسوق السعودي ( تاسي ). و يجدر الإشارة إلى أن البيانات الاحصائية لهذه الدراسة تشير إلى انخفاض معدل المضاربة خلال فترة إجراء الدراسة.

**الكلمات المفتاحية:** تاسي ، الخام العربي الثقيل ، الخام الأمريكي الخفيف، عقود النفط المستقبلية ، أسعار الفائدة قصيرة الأجل

## 1- Introduction

The Saudi stock exchange in its current structure is relatively new. The establishment of the trading system TADAWUL increased the amount of funds coming into the market regardless of the relatively small number of listed companies. The unusual flow of funds and the lack of professional traders cause the crash of the market in 2006. The role of the Capital market authority (CMA), which was established in 2004, in managing the exchange increased after 2006. The recent changes in the Saudi economy and the implication of new policies grant a higher level of transparency that are beginning to show some positive outcome. The inclusion of the TASI index under the umbrella of the MSCI EM indices would change the atmosphere of the Saudi capital market as it would increase the presence of professional investment practitioners along with increasing the overall size of the market. Such changes in the stock market ought to benefit all listed companies.

By exporting 7.6 million barrels of oil per day during 2017 Saudi Arabia ranks as the largest petroleum exporter in the world. By May 2018, Saudi Arabia accounts for around 15 percent of the world total petroleum exports, followed by Russia which comprises about 11 percent of the global exports. Furthermore, based on the Organization of Petroleum Exporting Countries (OPEC) latest data Saudi Arabia contains more than 20 per cent of the world proven reserves of oil. This volume of exports represents around 30 percent of Saudi GDP. In addition, the revenue from oil exports funds around 80 percent of total government expenditures. This position of Saudi Arabia in the global oil market makes its economy highly exposed to fluctuations in the oil market.

Those factors catalyze the aim of this paper to examine the impact of Crude oil, which is one of the major elements of the Saudi economy, on TASI.

## 2. Research Question & Hypotheses

This research intends to examine TASI from three dimensions. First, it will examine the reaction of the TASI index toward the two primary benchmarks within the oil market. West Texas Intermediate, WTI, and Brent Crude Oil. Since the US dollars gap between the two parameters has varied considerably in the recent past, running the study with both types will give a deeper understanding of the forces that could drive changes under the TASI index as the oil market forces change. Also, this study examines the impact of the difference between the futures and the spot prices of both benchmarks along with the spot prices of both. In that the research is referring to past studies which addressed similar points such as Huang et al.(2023) ,Banerjee et al.(2023) Benbachir et al.,(2022) Gay (2016) and Sadorsky (2001). Furthermore, the research includes macroeconomic variables, which is supported one if the most known study in this area Fama (1981), along with a global equity index, FTSE 100, as secondary explanatory variables.

Understanding the impact of the country's primary source of funds would provide the required base for a greater understanding of the movements of the TASI index. This research is conducted with secondary indicators, and the main aim is to empirically examine the relationship between the TASI index and the global oil market as represented by crude oil prices. The research question is:

**“Is TADAWUL All Shares Index (TASI) disproportionately impacted by fluctuations in global crude oil prices?”**

### Hypothesis

The following are the research hypotheses which represent both primary and secondary explanatory variables.

$H_0^1$  There is no relationship between changes in WTI spot oil prices and changes under TASI.

$H_A^1$  There is a relationship between changes WTI spot oil prices and changes under TASI.

$H_0^2$  There is no relationship between changes in Brent Crude spot prices and changes under TASI.

$H_A^2$  There is a relationship between changes in Brent Crude spot prices and changes under TASI.

$H_0^3$  The basis between WTI Spot and Futures Prices does not cause any change under TASI.

$H_A^3$  The basis between WTI Spot Futures Prices does cause changes under TASI.

$H_0^4$  The basis between Brent Crude Spot and Futures does not cause any changes under TASI.  $H_A^4$  The basis between Brent Crude Spot and Futures does cause changes under TASI.

$H_0^5$  There is no relationship between changes in the Saudi CPI and Changes under TASI.

$H_A^5$  There is a relationship between changes in the Saudi CPI and Changes under TASI.

$H_0^6$  Changes in the short-term interest rates has no impact on TASI.

$H_A^6$  Changes in the short-term interest rates has an impact on TASI.

$H_0^7$  There is no relationship between changes in the spot gold prices and changes under TASI.

$H_A^7$  There is a relationship between changes in the spot gold prices and changes under TASI.

$H_0^8$  There is no relationship between changes in the total levels of the Saudi imports and changes under TASI.

$H_A^8$  There is a relationship between changes in the total levels of the Saudi imports and changes in the TASI.

$H_0^9$  There is no relationship between changes in the total levels of investments by the private sector in private securities and changes under TASI.

$H_A^9$  There is a relationship between changes in the total levels of investments by the private sector in private securities and changes under TASI.

$H_0^{10}$  Changes in the FTSE 100 index does not cause changes under TASI.

$H_A^{10}$  Changes in the FTSE 100 index cause changes under TASI.

### 3.Literature Review

The literature review is divided into three parts. First, it examines papers that cover the relationship between oil and various stock markets. Then, it covers literature that explores the relationship between different stock markets and macroeconomic variables. Finally, it covers studies that examines the Saudi stock market.

#### The Relationship Between Oil prices and Stock Markets.

Using monthly data for the period between 2006 and 2019 Banerjee et al.(2023) examine the impact of oil prices, presented with Dubai Fateh Crude oil, on the Abu Dhabi Stock Exchange. Their VAR model also includes two other explanatory variables. Emirates Inter Bank Offer Rate as a proxy for the monetary policy. In addition to that, they used FDI as proxy for GDP. FDI stands for Foreign Direct Investments which is included in the research to show the diversification implemented to the UAE GDP taking into consideration the positive impact FDI has on the GDP during the period between 2008 and 2013. Their empirical results indicate a positive long-term linkages oil prices and Abu Dhabi stocks exchange. Their results came consistent with the existing literature that showed oil exporting countries are positively impacted by changes in the global oil prices. On the other hand, interest rates showed a negative impact of the examined stock index. However, this result holds only for the short run.

Using OLS model Huang et al.(2023) aim to predict and explain the return of selected stocks in Taiwan. They build their model using various explanatory variables. They use Crude oil futures, gold futures, and a sect of financial variables. Those variables include earnings to price ratio, dividend to price ratio book to market ratio, long term yield which is presented by 10 years bonds, and short-term yield. The OLS model was applied with monthly data for the period between January 1996 to December 2020. Their results concluded that the oil variable was the best in predicting the return at a significant level. It is followed by gold and financial variables respectively.

By conducting an event study, Benbachir et al.(2022) investigate the linkages between oil prices shocks and a set of MENA countries, both oil exporting and importing countries. Their study covered eight oil shocks that occurred between 2002 and 2020. The countries covered in their study included Jordan, Morocco, Qatar, Turkey, Saudi Arabia, and United Arab Emirates. Their paper concluded that stock markets are impacted by oil shocks at a significant level, especially on the event day. Even though the direction and the length of the reaction differ from one event to another, the global financial crisis in 2008 recorded the largest impact on all markets on the event day. Their findings highlight the sensitivity of stock markets to oil shocks, which would be important to consider by financial authorities.

Over the period between 1999 and 2006 with monthly average frequency Gay (2016) examined the existence of the relationship between oil prices and exchange rates as macroeconomic variables and stock indices in Brazil, Russia, India, and China, which are known as BRIC countries. The empirical results of the Autoregressive Moving Average Model (ARMA) show a positive relationship between the exchange rates all examined indices except the Russian stock index. Regarding the relationship between oil prices and stock indices, it was only proven at a significant level in the case of the Indian stock market.

By using monthly data for the period from April 1983 to April 1994 Sadorsky (2001) used an OLS model to study the relationship between the expected return of companies in the oil and gas industry listed on the Toronto Stock Exchange and fluctuation in the global oil market. In that, the predictor variables were market returns, exchange rates, interest rates and Futures Crude oil prices. The empirical results indicate a significant impact of all these variables on the predicted variable.

#### **The Relationship Between Macroeconomic Factors and Stock Markets.**

Fama (1981) in his one of the most cited papers in the research world, proposes hypothesis that there is a negative relationship between stock returns and inflation rates. He examined the existence of this relationship for the period after 1951 at a different frequency. The empirical results of that research confirm the presence of an inverse relationship between stock returns and inflation rates. It also affirms that stock returns are more affected by real economic activities. It includes capital expenditure as a proxy for real economic activity. The study covers the period after 1953, after World War II, and to ensure consistency of the results it examines three separate samples with different frequencies.

In their research Pinem et al. (2023) examined the impact of few global stock indices and some macroeconomic variables of the Jakarta Composite index (JCI). The Global indices covered in their research are the Shanghai Stock Exchange Composite (SSE), Dow Jones Industrial Average (DJIA), Strait Singapore index, and Nikkei 225 (N225). They also use BI rate, Exchange rate index and inflation rate as macroeconomic variables. For their regression model they use monthly data for the period between January 2018 and December 2020. The empirical results of their research show that only Nikkei 225, DJIA and interest rates have an impact on JCI. They positively affect the Jakarta Composite index. On the other hand, Inflation, SSE and Strait Singapore index has no impact on JCI.

In their paper, Bayramova and Ojagverdiyeva (2010) empirically examined the impact of four macroeconomic factors through related proxies on the Kazakhstan Stock Exchange. They used Consumer Price Index (CPI) to capture the effect of inflation and the level of money supply to capture the impact of changes in monetary policy. They also used the historical exchange rates to capture the effect of the strength of the Kazakh Tenge. The last variable was the industrial production index as a proxy for economic activity. In their research, they applied the Vector Auto-Regressive (VAR) model on monthly data for the period from 2000 to 2009. The empirical results of their conclude that all the tested variables have no significant impact on the predicted variable except the exchange rate index.

Islam and Habib (2006) used monthly data for the period from April 2005 to October 2015 to examine the impact of a set of macroeconomic variables on the Indian stock market. They chose the inflation rate, the money supply, the exchange rate, the interest rates, the industrial production, and spot oil prices to be their independent variables. The results of their OLS model indicate a negative relationship between Indian stock returns and rates of inflation, exchange rates interest rates, and money supply and a positive relationship with spot oil prices and industrial production.

#### **The Saudi Stock Market.**

Through examining weekly data from 2003 to 2013 Rehman and Hazazi (2014) study the “linkages” between the TASI and other major global stock indices. All were GCC indices, Dow Jones, S& P500, NASDAQ, Nikkei 225, and FTSE 100. The period of their study divides into two equal parts. Since the cross-correlation was higher during the second phase, they concluded that the correlation between TASI and all other used indices subject to the research has increased over time.

Algahtani (, 2016) uses different variables as proxies for economic activities to examine the impact of shocks in the Brent crude oil prices on the economic activities in Saudi Arabia. His research included the following variables: real GDP, total real investments, total government expenditures, real total trade balance and the consumer price index. He overcomes the challenge of lack of quarterly data by using annual data for his research period which was between 1970 and 2015. The results of the VAR model indicate that oil shocks highly impact all variables at a statistically significant level.

Using weekly data, Wong and Massah (2017) have examined the impact of shocks in Brent crude oil prices on prices of GCC stock indices. To control for the market size and to avoid noisy data they created a weighted index based on the weekly market value for each index for the period from January 7, 2005, to December 25, 2015. All indices are presented in the form of return indices, expressed in US dollars to match the currency of the other predictor variable, Brent crude oil. They use a VAR model since they want to study the impact of volatility. They conclude that Saudi Arabia, Kuwait, and United Arab Emirates are significantly affected by changes

in Brent Crude oil prices. GCC markets also proved, according to this research, to be interconnected. However, shocks did not have a significant impact on Oman since it is not a major oil exporter like other GCC countries.

By using monthly data from January 1994 to June 2013 Kalyanaraman and Al Tuwajr (2014) examine the impact of certain macroeconomic factors on the returns of the TASI index. They use M2 as a proxy for the level of money supply and CPI index capture the impact of inflation. They also use monthly prices for the S&P 500 to examine the level of TASI's exposure to the global equity markets. Furthermore, they use nominal effective interest rates, as a proxy for exchange rates, to examine the impact of the movement of capital into the Saudi market. They conclude that there is a significant relationship between the TASI index and all studied variables except the S&P 500 index.

Mensi et al.( 2015), examine the relationship between the Saudi stock exchange and a set of different commodity futures. Those markets are gold, silver, wheat, corn, rice and WTI oil. The research deals with daily data from June1, 2005 to August13, 2014 in which the volatility of all tested markets was high. The results of their research suggested an “insignificant dynamic conditional correlation” between TASI and the studies commodity markets except for the silver futures markets Mensi et al.( 2015).

Using weekly data, Ismail et al.(2021) examined the impact of oil prices on the stock market return for GCC countries. In their research they use three explanatory variables. Brent Crude prices, geopolitical risk index for all countries, and global economic activity. They found that oil prices significantly drive stock returns in all GCC countries.

#### 4. Data & Methodology

The research covers the period from January 1995 to December 2017 with monthly frequency, thus there is a total of 276 observations. During that time the Saudi economy changes dramatically. The data of this research is summarized in Table (1-3).

	Variable	Description	Economic Rationale
The Dependent variable	TASI	Tadawul All Shares Index (Predicted variable)	The research examines the TASI index, as it is the main index in the Saudi capital market.
The Primary Predictor (Explanatory) Variables	WTI	West Texas Intermediate Spot Prices	To objectively address the impact of the oil market, both benchmarks will be used.
	BRENT CRUDE	European Brent Crude Spot Prices	
	Basis <sub>WTI</sub>	Spot Price WTI – Future Price WTI	Futures prices capture the dynamics expected to surround oil in the future. The basis is used to avoid multicollinearity with spot prices.
	Basis BRENT CRUDE	Spot Price-Brent Crude – Future Price WTI	<i>The December contract was chosen because of its liquidity, which is seen in high volumes and large number of open interests, in comparison to other active contracts.</i>
The Secondary Predictor (Explanatory) Variables	Gold	Spot Gold prices	As a commodity, it moves against Crude oil, the primary predictor variable in this research. This is combined with the level of gold reserve for Saudi Arabia.
	CPI Index	JPM Saudi Consumer Price Index (a proxy for Inflation rates)	Higher inflation lowers the value of future income from stocks such as dividends.
	Repo	Saudi Repurchase Offer Rate, SAMA policy Rate.	The level of interest rate determines the flow of capital into the economy and out of it.
	Imports	The total value of Saudi Monthly Imports.	Sectors that capture the largest percentage of total imports, have a significant impact of the largest burdens of the Saudi GDP.
	Private	The monthly funds invested in	How heavily the Private sector invest in financial

Variable	Description	Economic Rationale
sector	private securities by the private sector	instruments tells the presence of institutional investors in comparison to individual investors
Global Equity Market (GE)	FTSE 100	To counter for fundamental stock prices predictors such as dividends, a global stock Index will be used.

### Methodology

This research was conducted using an Ordinary Least Squares (OLS) regression model for various reasons. First, the primary aim of this study is examining the existence of the relationship between the chosen explanatory variables and the predicted variable. In addition, the research consists of time series data, and an OLS model is suitable for this type of data. As mentioned above, the OLS model is used in extant literature to examine the relationship between a stock market and various variables Huang et al. (2023), Islam and Habib (2006) and Sadorsky (2001).

The base model of this research consists of two main equations. Each examines the impact of a single benchmark in the global oil market, Brent Crude oil and WTI, on the TASI index. Also, both equations are examined with the FTSE 100 index as a proxy for the global equity market.

$$TASI = \alpha + B_1 \text{ oil sopt}_{WTI} + B_2 \text{ Basis}_{WTI} + B_3 \text{ CPI} + B_4 \text{ Repo} + B_5 \text{ Gold} + B_6 \text{ Imports} + B_7 \text{ PS} + B_8 \text{ GE} + \varepsilon_t \tag{1}$$

$$TASI = \alpha + B_1 \text{ oil sopt}_{QA} + B_2 \text{ Basis}_{QA} + B_3 \text{ CPI} + B_4 \text{ Repo} + B_5 \text{ Gold} + B_6 \text{ Imports} + B_7 \text{ PS} + B_8 \text{ GE} + \varepsilon_t \tag{2}$$

Where

*TASI* is the monthly closing Prices for TADAWUL All SHARES INDEX; *Oil Spot<sub>WTI</sub>* is the monthly closing prices for West Texas Intermediate Crude oil; *Oil Spot<sub>BRENT CRUDE</sub>* is the monthly closing prices for Brent Crude Oil; *Basis<sub>WTI</sub>* is the cash difference between the December future contract and the monthly close price at the year of interest.; *Basis<sub>BRENT CRUDE</sub>* is the cash difference between the December future contract and the monthly close price at the year of interest. *CPI* is the monthly Saudi Consumer Price index Computed by JP Morgan; *Repo* is the 3-months SAMA policy Rate.; *Gold* is End- of the month closing price for gold; *Imports* is the total value of the monthly imports expressed in US dollars; *PS* is the total value of the monthly investments by the Private sector in Private securities converted expressed in US dollars and *GE* is monthly closing prices for chosen global equity index, FTSE100.

### 5. Results and Discussion

The discussion of the results outlines that all the examined variables, except the spot gold prices, have a significant impact on the movement of the TASI index. Table 2 and 3 Summarize the estimation results for equations 1 and 2 respectively.

Table (2-3): The Estimation Results for Equation 1

Variable	Coefficient	Prob.
Coefficient	0.005	0.122
West Texas Intermediate Spot Price	0.359	0.0003***
Basis West Texas Intermediate	-0.001	0.0010**
Consumer Price Index	-0.007	0.0001***

Variable	Coefficient	Prob.
Repurchase Offer Rate	0.063	0.0037**
Spot Gold Prices	-0.321	0.0767
Level of Imports	-0.119	0.0303**
Investment in Private Securities by the Private Sector	0.330	0.0063**
The FTSE 100 Index	0.810	0.0002***

◆ Adjusted R-squared: 0.289702

\*\*\*, \*\*, \* represent 'alpha' values of 1percent, 5percent and 10percent 'significance' levels respectively (Rejection of Null Hypothesis )

Table (3-3): The Estimation Results for Equation 2

Variable	Coefficient	Prob.
Coefficient	0.003	0.3840
Spot Brent Crude Oil	0.302	0.0010**
Basis Brent Crude Oil	-0.001	0.0027**
Consumer Price Index	-0.007	0.0001***
Repurchase Offer Rate	0.062	0.0050**
Spot Gold Prices	-0.328	0.0710
Level Of Imports	-0.116	0.0354**
Investment in Private Securities by the Private Sector	0.330	0.0066**
The FTSE 100 Index	0.803	0.0002***
◆	Adjusted R-	squared: 0.282798

\*\*\*, \*\*, \* represent 'alpha' values of 1 percent, 5 percent, and 10 percent 'significance' levels respectively (Rejection of Null Hypothesis)

Although the spot prices of Brent Crude positively impact the TASI index at a statistically significant level, WTI spot prices have a higher impact on the TASI index. This is clearly shown in the coefficient values of 0.302 and 0.359 for Brent Crude and WTI respectively. Those coefficients also combined with a higher level of significance. This finding is critical to traders in the TASI index as it will guide their analysis toward a specific benchmark in the global oil market. On the other hand, the basis of both WTI and Brent Crude has an inverse impact on the TASI index at a significant level. However, the basis of WTI has a larger impact on the TASI index in comparison to the basis of Brent Crude oil.

As tables (2-3) and (3-3) show the CPI index maintains its inverse impact, at a statistically significant level, on the TASI index with both Brent Crude and WTI. The CPI index was included in the model as a lead variable, taking into consideration the forward-looking nature of the stock market. On the other hand, the results shows that there is a positive impact of the short-term interest rates on the TASI index at a significant level which is inconsistent with the existing literature that examined the relationship between interest rates and the TASI index Kalyanaraman and Al Tuwajr (2014). With coefficients equal -0.119 and -0.116 in equations 1 & 2 respectively, the total level of imports has an inverse relationship on the TASI index at a statistically significant level. Usually, the level of imports increases during economic growth as more funds are assigned to investment. Accordingly, investors may have a wider selection of investments to consider. As a result, many investors would choose to divest from the speculative market and move toward more stable investments. The level of investments in private securities by the private sector has a significant impact on the TASI index. The magnitude of the positive impact that this variable has on the TASI index is close to the magnitude of the impact that is caused by the primary explanatory variable, WTI. Such influence may signal the evolvement of a new sector under the Saudi capital market.

The estimation results of the base model show that the spot gold prices have insignificant impact on the TASI index. This result holds with both WTI and Brent Crude. With a coefficient closer to 1, the FTSE 100 has a significant impact on the TASI index among the other indices. The significant impact of the FTSE 100 on the TASI index could signal the existence of many dual investors in both indices.

## 6. Examining the Residuals of the Research Model

The gap between the actual and the fitted value of the model indicates the ability of the predictor variables to explain the variation in the predicted variable. Figure (1-1) illustrates the wider gap, more residuals, between the actual and the fitted values during the period prior to 2007. It is clearly shown in the nadir in 2006 where the actual values are far from the fitted value. In 2008, however, the TASI index fell sharply, and the fitted values of the model are not that far from the actual value. In addition to that, the gap between the actual and the fitted values continues to be minimized after 2008. This indicates that covariance of the TASI index with the explanatory variables increases over time.

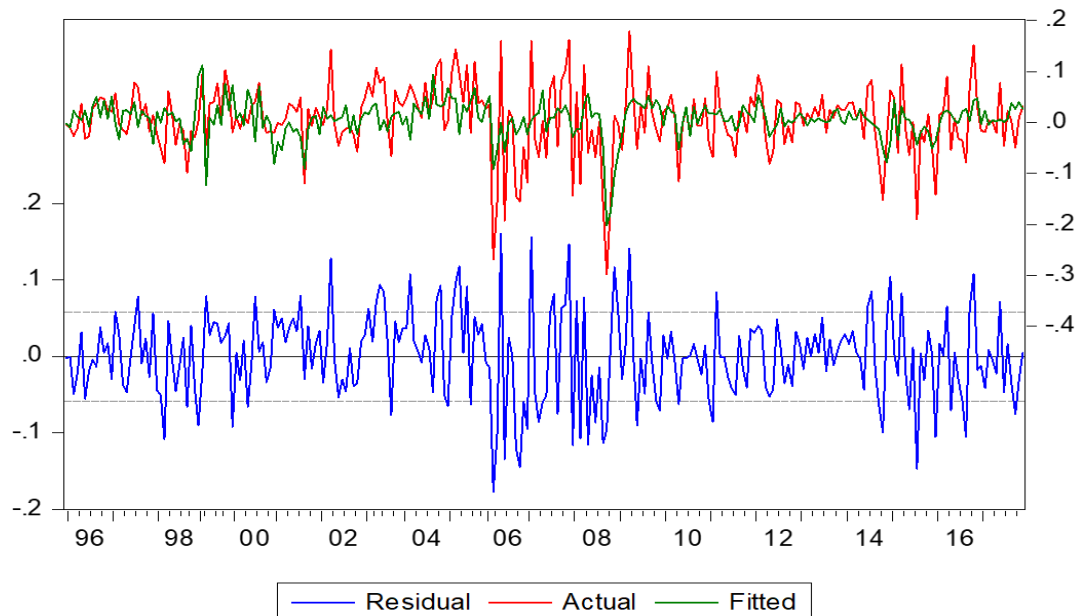


Figure (1-1): The Movement of the Actual and Fitted values over the sample period.

high trend of speculation with volatile flow of fund especially after 9/11 which drives many investors to bring their investments back to Saudi Arabia because of the rising political uncertainty AlKhaldi(2015). In February,2006 TASI dropped from more than 19 thousand points to reach 7 thousand points in December of the same year. In values this was a bleeding of two trillion Saudi riyals, more than half a billion US dollars, which was around 65 percent of the index value. Such a dramatic fall was not explained by “national economic indicators” AlKhaldi (2015).

## 7. Concluding Remarks

The results of this research show a positive impact for spot prices of both WTI and Brent Crude on the TASI index at a statistically significant level. The basis variable for both benchmarks, however, has an inverse impact on the predicted variable. Although spot prices for both WTI and Brent Crude are consistent in their directional impact on the TASI index, the magnitude of their impact is different. Changes in the WTI have more impact on the TASI index in comparison to the Brent Crude. This finding may provide a specific parameter for investors to follow when analyzing the TASI index.

Furthermore, all secondary explanatory variables have a significant impact on the TASI index except the spot gold prices. However, these variables differ in their level of impact on the TASI index. For instance, the magnitude of the funds invested by the private sector in private securities is closer to the magnitude of the oil spot price variables. Such findings may indicate that corporations avoid expanding their operational business because of the lack of supportive business environment. Regarding the examined global equity index, it has a significant impact on the TASI index.

As this research examined the impact of various factors on TASI, its findings would be useful to both policy makers and investors. As it shows the impact of major macroeconomic variables on TASI, The research will contribute to the existence research in building and implementing new polices that will improve the level of efficiency in the Saudi stock market. As mentioned above the gap between the actual and the fitted values continues to be minimized after 2008, which I would refer to as a positive movement toward a more efficient market. Furthermore, the results of this research would shed light on various aspects that need to be evaluated by portfolio managers while investing in TASI.



Based on the research findings, the global equity market has a significant impact on the variation of the TASI index. This finding may be used as base for further research in which a researcher could examine the cross- correlation between the TASI index and various global equity indices. For instance, the nature of the relationship could be examined during systematic crises, such as COVID-19, as well as during economic growth to see the level of consistency in the relationship.

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