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Contact Information

Paul Yammine

paul.yammine@blominvestbank.com

Throughout history, wars have surged in the Middle East in a repeated and regular manner. Due to its strategic location, abundance of resources and many more, the area was always subjected to foreign interest and influence. These wars mainly impact the locals with consequent humanitarian crises. In addition, such wars impact negatively the economy of the Middle-Eastern countries where war escalated first. Next, the economic challenges spread to the entire Middle East and beyond to reach a worldwide level. In this article we will be discussing the main commodities, stocks and indices that are impacted by these wars. Our analysis will be based on five recent historical wars that had/are having an impact on the Middle East and the world.

1. Introduction

Due to the ongoing/long lasting wars and tensions in the Middle East, it is crucial for us to understand the impact of these conflicts on a wider level .

The Middle East has witnessed frequent wars. To put this into numbers, since 1950, the Middle East has seen around 20 wars excluding civil wars, internal conflicts and their duration. At the time being, three ongoing wars are taking place in the Middle East.

Throughout wars, the main financial assets impacted are commodities and notably OIL & GOLD, as well as, the military defense stocks. Indices and other financial assets would follow.

For this article, we have chosen to research, and analyze data from the five most recent wars in the Middle East. The 5 wars are: First Gulf war (1990-1991), Iraq war (2003-2011), Lebanon war (2006), Syrian war (2011-Present) and Yemen war (2014 - Present). The aim is to analyze, understand and forecast the impact on the above noted financial assets from the ongoing wars based on the historically reported wars and associated events. We will be using a simple regression model, to understand the impact caused on each financial asset; however, the model is limited by the focus of the study on a restricted time frame. Future research could explore the long-term financial impacts of the conflicts and perhaps assess economic improvements or deterioration emerging after the conclusion of the conflict.

2. Context

As stated earlier, conflicts in the Middle East have been ongoing. Iraq invaded Kuwait in 1990, which led to the First Gulf War (1991). Iraq was compelled to leave by a coalition led by the US. The United States launched the Iraq War (2003–2011) in an attempt to overthrow Saddam Hussein's government, which resulted in a protracted and unstable battle. Israeli-Lebanese war (2006) was a brief war in Lebanon that caused a great deal of damage and fatalities. Numerous factions are fighting for control in the continuing civil war in Syria (2011 – present), and the war has generated extensive destruction and human losses. The Houthi rebels, the Yemeni government, and a coalition commanded by Saudi Arabia are all parties to the complicated Yemen War (2014 – present), where a serious humanitarian crisis has resulted from the fighting.

Studies examining the impact of these conflicts on financial markets are limited. This note aims to fill in the literature a gap regarding these conflicts; more specifically to understand their impact on interesting commodities and financial assets, and to be able to forecast the impact in case we face new conflicts in the future. For this study we chose to focus on WTI, GOLD and the stock market shares of Lockheed Martin (LMT), as these financial assets are directly impacted by wars in general. More precisely, this is because the Gulf area in the Middle East controls a big chunk of the world Oil supply as well as LMT is a US military defense

company and finally Gold is the safe heaven where demand usually spikes in periods of uncertainty.

3. Methodology

The methodology follows a quantitative approach using Ordinary Least Squares (OLS) regression to analyze the impact of war-related variables on asset prices, specifically as mentioned WTI crude oil, Gold, and Lockheed Martin (LMT). Below is a summary of the methodology, including the key formulas and steps implemented:

I. Variables Definition

The historical data for WTI crude oil, Gold, and Lockheed Martin (LMT) are used along with the data for variables that describe various aspects of wars and conflicts.

- The dependent variables would include:
 - Asset-Specific variables:
 - Adjusted Close at time: The closing price after adjustments for all applicable splits and dividend distributions .
 - Volume at time: The number of shares or contracts traded in an asset or security over a period of time, usually over the course of a trading day.
- The independent variables would include:
 - War-related variables:
 - War Duration: Duration of a particular conflict.
 - Intensity: A measure of conflict intensity, capturing the magnitude of war activities.
 - Global Intervention: Proxy for global powers' involvement in conflicts.
 - Dummy variables for specific wars: (Iraq War, Lebanon War, Syrian War, Yemen War) to capture war-specific effects on asset prices.

- Macroeconomic variables:
 - S&P 500: To control for general market conditions.
- Asset-Specific variables:
 - Lagged Adjusted Close: The previous day's adjusted close price to capture autocorrelation (time dependency) in asset prices.
 - Asset Type (WTI, Gold, LMT): Categorical variables to differentiate between the asset classes in the combined regression.

II. Regression Model Specification

Multiple OLS regressions were implemented to estimate the relationship between the independent variables (war-related factors, macroeconomic indicators, and asset-specific variables) and the dependent variable (adjusted close prices of WTI, Gold, and LMT).

The general formula for the OLS regression is:

$$Y_t = \beta_0 + \beta_1 \cdot X_1 + \beta_2 \cdot X_2 + \dots + \beta_k \cdot X_k + \varepsilon_t$$

Where:

- Y_t is the dependent variable (adjusted close price of WTI, Gold, or Lockheed Martin at time t).
- $X_1, \dots, X_k$ are the independent variables, including war factors (Intensity, War Duration, dummy variables for specific wars), macroeconomic factors (S&P 500, Growth), and lagged prices.
- β_0 is the intercept.
- $\beta_1, \dots, \beta_k$ are the coefficients for each independent variable, indicating their effect on the dependent variable, or how strongly the independent variables (such as war related factors...) are associated with changes in the dependent variable, like the adjusted close price for WTI, GOLD or LMT .
- ε_t is the error term, capturing unexplained variance.

III. Combined Regression of WTI, Gold, and Lockheed Martin

A combination of the asset types in a single regression was done to capture the overall effect of wars on all three asset classes. The combined regression formula was:

$$Y_t = \beta_0 + \beta_1 \cdot \text{WarDuration} + \beta_2 \cdot \text{Intensity} + \beta_3 \cdot \text{Global Intervention} + \dots + \beta_k \cdot \text{Asset Type Dummies} + \epsilon_t$$

Here, **Asset Type dummies** (WTI, Gold, and Lockheed Martin) were used to differentiate between the behavior of each asset under the influence of war and macroeconomic variables.

The model uses an OLS regression framework to quantify the influence of war-related variables, economic factors, and asset-specific characteristics on the adjusted close prices of WTI, Gold, and Lockheed Martin. The models will highlight that war intensity, duration, and global interventions have significant effects on asset prices, with war-specific and asset-specific impacts being key drivers.

4. Estimation and Results

I. Data Series

As the five recent wars were chosen, data was collected from the stock market the adjusted close on a weekly basis for every financial asset over the time frame of each war. On the other hand, the chosen independent variables include: War duration, War intensity, S&P500 change and lagged adjusted close. These independent variables were also collected on a weekly basis to fit the time frame of each war. The data collected comes from Yahoo Finance and Macro trends; specifically, global intervention quantified by 0 or 1 and the intensity is quantified from 0 to 100 depending on each war

II. Estimation

Below is the estimation output for each dependent variable along with the one for the combined model, while including as dependent and independent variables the ones defined earlier.

The Impact of Middle Eastern Wars on Selected Commodities and Financial Assets

WTI OLS

OLS Regression Results

Dep. Variable:	Adj Close	R-squared:	0.981
Model:	OLS	Adj. R-squared:	0.981
Method:	Least Squares	F-statistic:	1.517e+04
Date:	Mon, 18 Nov 2024	Prob (F-statistic):	0.00
Time:	14:30:11	Log-Likelihood:	-3147.2
No. Observations:	1199	AIC:	6304.
Df Residuals:	1194	BIC:	6330.
Df Model:	4		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
Intensity	0.0018	0.006	0.291	0.771	-0.010	0.014
Global Intervention	1.796e-05	6.17e-05	0.291	0.771	-0.000	0.000
S&P 500	0.0053	0.006	0.887	0.375	-0.006	0.017
Lagged Adj Close	0.9876	0.004	232.068	0.000	0.979	0.996
War_Iraq_War	0.8088	0.663	1.220	0.223	-0.492	2.109
War_Lebanon_War	0.0809	1.797	0.045	0.964	-3.444	3.606
War_Syrian_Civil	0.6607	0.661	1.000	0.318	-0.636	1.957

Omnibus:	162.953	Durbin-Watson:	1.983
Prob(Omnibus):	0.000	Jarque-Bera (JB):	1216.730
Skew:	-0.373	Prob(JB):	6.17e-265
Kurtosis:	7.878	Cond. No.	9.23e+18

GOLD OLS

OLS Regression Results

Dep. Variable:	Adj Close	R-squared:	0.607
Model:	OLS	Adj. R-squared:	0.606
Method:	Least Squares	F-statistic:	530.4
Date:	Mon, 18 Nov 2024	Prob (F-statistic):	0.00
Time:	14:38:21	Log-Likelihood:	-12379.
No. Observations:	1725	AIC:	2.477e+04
Df Residuals:	1719	BIC:	2.480e+04
Df Model:	5		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
Intensity	2.2344	0.583	3.831	0.000	1.091	3.378
Global Intervention	0.0223	0.006	3.831	0.000	0.011	0.034
S&P 500	9.7818	0.773	12.651	0.000	8.265	11.298
Lagged Adj Close	7.5162	0.356	21.109	0.000	6.818	8.215
War_Iraq_War	71.8294	62.145	1.156	0.248	-50.058	193.717
War_Lebanon_War	-153.0958	169.915	-0.901	0.368	-486.358	180.166
War_Syrian_Civil	796.2961	61.858	12.873	0.000	674.972	917.621
War_Yemen_Civil	880.2523	61.401	14.336	0.000	759.825	1000.680

Omnibus:	150.391	Durbin-Watson:	0.032
Prob(Omnibus):	0.000	Jarque-Bera (JB):	189.807
Skew:	0.804	Prob(JB):	6.08e-42
Kurtosis:	3.229	Cond. No.	6.35e+18

The Impact of Middle Eastern Wars on Selected Commodities and Financial Assets

LMT OLS

OLS Regression Results

Dep. Variable:	Adj Close	R-squared:	0.513
Model:	OLS	Adj. R-squared:	0.511
Method:	Least Squares	F-statistic:	361.6
Date:	Mon, 18 Nov 2024	Prob (F-statistic):	3.76e-265
Time:	14:38:58	Log-Likelihood:	-10470.
No. Observations:	1725	AIC:	2.095e+04
Df Residuals:	1719	BIC:	2.098e+04
Df Model:	5		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
Intensity	0.8606	0.197	4.359	0.000	0.473	1.248
Global Intervention	0.0086	0.002	4.359	0.000	0.005	0.012
S&P_500	2.5672	0.265	9.702	0.000	2.048	3.086
Lagged Adj Close	0.2498	0.118	2.123	0.034	0.019	0.481
War_Iraq_War	29.6429	20.540	1.443	0.149	-10.644	69.930
War_Lebanon_War	-57.5799	35.611	-1.617	0.106	-127.426	12.266
War_Syrian_Civil	144.7113	18.871	7.668	0.000	107.699	181.724
War_Yemen_Civil	293.3927	20.294	14.457	0.000	253.588	333.197
Asset_Type_Martin	-87.1228	22.066	-3.948	0.000	-130.402	-43.843

Omnibus:	10.523	Durbin-Watson:	0.021
Prob(Omnibus):	0.005	Jarque-Bera (JB):	10.584
Skew:	0.174	Prob(JB):	0.00503
Kurtosis:	3.160	Cond. No.	2.16e+19

COMBINED WTI, GOLD and LMT OLS

OLS Regression Results

Dep. Variable:	Adj Close	R-squared:	0.847
Model:	OLS	Adj. R-squared:	0.846
Method:	Least Squares	F-statistic:	3566.
Date:	Mon, 18 Nov 2024	Prob (F-statistic):	0.00
Time:	14:45:21	Log-Likelihood:	-35974.
No. Observations:	5175	AIC:	7.197e+04
Df Residuals:	5166	BIC:	7.203e+04
Df Model:	8		
Covariance Type:	nonrobust		

	coef	std err	t	P> t	[0.025	0.975]
War_Duration	30.3423	2.861	10.606	0.000	24.734	35.951
Intensity	8.2884	0.300	27.633	0.000	7.700	8.876
Global Intervention	0.0829	0.003	27.633	0.000	0.077	0.089
S&P_500	0.3479	0.239	1.456	0.146	-0.121	0.817
Lagged Adj Close	2.9174	0.164	17.786	0.000	2.596	3.239
War_Iraq_War	-178.2714	10.141	-17.579	0.000	-198.153	-158.390
War_Lebanon_War	-2.2675	78.438	-0.029	0.977	-156.039	151.504
War_Syrian_Civil	17.7451	7.713	2.301	0.021	2.625	32.866
War_Yemen_Civil	118.3576	6.020	19.662	0.000	106.557	130.159
Asset_Type_Marti	-1199.3806	12.379	-96.891	0.000	-1223.648	-1175.113
Asset_Type_Martin	-1082.7571	10.651	-101.659	0.000	-1103.637	-1061.877
Asset_Type_WTI	-1272.5019	8.615	-147.705	0.000	-1289.391	-1255.613

Omnibus:	522.567	Durbin-Watson:	0.022
Prob(Omnibus):	0.000	Jarque-Bera (JB):	1355.923
Skew:	0.577	Prob(JB):	3.67e-295
Kurtosis:	5.227	Cond. No.	1.42e+19

III. Results:

After analyzing the results of the regression models for WTI Crude Oil, Gold, Lockheed Martin (LMT), and the combined analysis, several important patterns emerge regarding the impact of war-related factors, macroeconomic indicators, and asset-specific characteristics on these asset classes .

i. WTI Crude Oil

- R-squared: 0.981 – The model explains 98.1% of the variance in WTI's adjusted close price, indicating a strong relationship between the predictors and the price of oil.
- War variables: The war dummy variables (e.g., Iraq War, Syrian Civil War) were generally statistically insignificant in the WTI model. This suggests that oil prices might not react strongly to war dummy variables in isolation but might be influenced by other factors such as economic or geopolitical forces outside the specific wars in the model.
- Intensity and Global Intervention: These variables were also insignificant, implying that war-related intensity and the degree of global involvement did not meaningfully affect oil prices.
- S&P 500: Although this was statistically insignificant, it suggests that oil prices are not heavily influenced by broad stock market movements.
- Lagged Price: Highly significant, suggesting that oil prices have strong time dependence (autocorrelation), where current prices are heavily influenced by previous prices.

WTI prices are more influenced by their own historical patterns rather than specific war-related factors in this model as they could be related to political and energy agendas of major countries or threats towards oil facilities.

ii. Gold

- R-squared: 0.607 – The model explains 60.7% of the variance in Gold's adjusted close price. This suggests that while the predictors

are relevant, other factors (not captured in this model) also influence Gold prices.

- War variables:
 - The Syrian Civil War and Yemen Civil War had strong positive effects on gold prices, showing statistical significance. This confirms that gold tends to serve as a "safe haven" during these conflicts, where investors seek it as a hedge against instability.
 - The Iraq War and Lebanon War were not significant, indicating no discernible effect on gold prices.
- Intensity and Global Intervention: Both were highly significant, with intensity having a positive impact on gold prices. This implies that higher conflict intensity and global intervention drive investors to buy gold.
- S&P 500: Positive and highly significant, suggesting that gold prices increase with the broader market, which may seem counterintuitive but could indicate a dual rise in confidence and demand for gold in certain economic environments.

Gold acts as a safe-haven asset during wars, especially in high-intensity conflicts or when global intervention is significant. Gold prices also rise in concert with broader market trends.

iii. Lockheed Martin (Defense Sector)

- R-squared: 0.513 – The model explains 51.3% of the variance in Lockheed Martin's adjusted close price. Similar to Gold, the model captures some, but not all, factors influencing defense stocks.
- War Variables:
 - Syrian Civil War and Yemen Civil War have a significant positive impact on LMT's stock price. This suggests that defense stocks benefit from prolonged or ongoing conflicts that require military supplies and technology.

- Iraq War and Lebanon War were not significant in this model, indicating less of an impact on Lockheed's stock price from these wars.
- Intensity and Global Intervention: Both were highly significant, indicating that higher intensity wars and global interventions lead to increases in Lockheed Martin's stock, likely due to increased demand for military equipment and contracts.
- S&P 500: Highly significant and positive, suggesting that Lockheed Martin's stock generally moves with the broader market.

Lockheed Martin's stock tends to rise during high-intensity wars and with global intervention, likely due to increased demand for defense products and services. Its performance is also positively correlated with the overall stock market.

iv. Combined Regression (WTI, Gold, Lockheed Martin)

- R-squared: 0.847 – The combined model explains 84.7% of the variance across the three assets (WTI, Gold, and Lockheed Martin).
- War Duration: Significant and positively correlated, meaning longer conflicts generally increase asset values across the board. This might reflect prolonged market uncertainty or demand for defense and safe-haven assets like gold.
- Intensity and Global Intervention: Both highly significant, indicating that high-intensity wars and substantial global intervention boost the underlying asset prices.
- Specific Wars:
 - Iraq War: Negative and significant. It appears to have had a detrimental effect across assets, likely due to specific market reactions at the time.
 - Syrian Civil War and Yemen Civil War: Significant and positive. These wars boosted the underlying asset prices, likely due to their protracted nature and geopolitical implications, which increased demand for both safe-haven and defense assets.

- Asset-Specific Effects:
 - Lockheed Martin: Strong negative coefficients for the asset type dummies suggest that the performance of LMT was more sensitive to other factors beyond just war-related variables.
 - WTI: The largest negative coefficients imply that WTI crude prices generally react negatively to war and global instability, consistent with fears of disrupted oil supply or demand destruction.

5. Conclusion

To conclude, wars in the Middle East are a main pillar in the volatility and instability of many commodities and financial assets where if the conflicts grow regionally and intensify involving other leading countries, it would lead to a bigger impact and instability. Moreover, these wars highly impact the volatility of Oil prices and their fluctuation. Oil prices are directly driven by geopolitical decisions. On the other hand, Gold is always a safe haven with increasing demand in periods of war and uncertainty. Nonetheless, it is impacted by the purpose/intensity of each war and its geopolitical goals and/or global intervention, which can be demonstrated in particular by the Syrian war. Lastly, LMT' s change in price is mainly led by the start of each war and its involvement in each war. It is impacted by the intensity and length of each, which explains the big impact made by the Syrian war on its stock price. Finally, through this model we are able to understand the future trends of each financial asset discussed depending on the war' s future events, whether they would lead to geopolitical escalations or to a de-escalation thus to the end of the conflict.

For your Queries:

BLOMINVEST BANK s.a.l.

Research Department

Zeituna Bey

POBOX 11-1540 Riad El Soloh

Beirut 1107 2080 Lebanon

Paul Yammine

paul.yammine@blominvestbank.com

Research Department

Tel: +961 1 991 784

research@blominvestbank.com

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