

The analyses of positive or negative effects of low or high crude oils' productions prices on the prices of its' gas prices overall outcomes on Houstonians & surroundings areas' residences

Abstract

This quantitative research study investigated the relationships/correlations between the actual prices of the barrel of oil and its' relationships/correlations with the actual prices of a gallon of gasoline between February 2023 and February 2024. This study used "Non-Experimental Descriptive Statistics" quantitative methodology to examine the secondary collected data. This study used "Social Construction of the Ideology of Reality Theory" to review why the prices of a barrel of oil and the prices of a gallon of gasoline were inconsistently made by OPEC. This study also used the conceptual formula Atatah known as Atatah's "Statistical Significant Differences Multiplier" (SSDM). This study finds that One-Sample Tests' Sig (2-tailed) is the same as the P. Value; which showed a statistical significance at 100% between the dependent and independent variables. This study suggests that OPEC needs to implement more consistent pricings between a barrel of oil and a gallon of gasoline which should bring some positive social changes to all Houstonians and surrounding areas' residences.

Keywords: OPEC, prices, oil, gasoline, barrel, gallon, transspecies, inconsistencies, Houston, Houstonians, surrounding areas' residences

Volume 8 Issue 2 - 2024

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Received: April 14, 2024 | **Published:** May 28, 2024

Introduction

Evidence had shown that the relationship between how much the actual daily prices of a barrel of crude oil was/is and the actual prices of its cumulative frequencies' prices outcomes such as a gallon of gasoline prices in the Houston Harris County, Texas and surrounding areas were/are never defined.^{1,2} As previously stipulated and pinpointed by Kisavi-Atatah and Atatah in prices effects investigation, majority of oil producing and exporting countries (OPEC) lack the marginal propensities to effectively, efficiently, and proficiently control and stabilize the prices of oil worldwide; and sometimes, the prices of oils and volumes of productions daily were/are USED as political weapons at wills. As such, the focus of this critical research study was to investigate the correlations/relationships between the actual daily costs of a barrel of oil and the actual prices Houstonians and surrounding areas' residences actually pay for a gallon of gasoline in the fueling stations.

Methodology

Previous research study investigated the roles of hydraulic fracking in Houston Harris County, Texas and surrounding areas by using Non-Experimental Descriptive Statistics measurements design concentrating on Houston data between 2010 and 2013. Also, this follow-up research study investigated the correlations/relationships between the actual daily costs of a barrel of oil and the actual prices Houstonians and surrounding areas actually pay for a gallon of gasoline in the fueling stations. "Non-Experimental Descriptive Statistics" examines all secondary data and makes some social scientific senses out of the outcomes of data analyses.^{3,4} Hence this methodology was selected over other quantitative methodologies for this research study.

Theoretical framework

This study used "Social Construction of the Ideology of Reality Theory" in making decisions about the prices of oils in general in the

OPEC countries in general; and the actual realities seen by the world as a result of over productivities, under productivities of oil and the effects of the US hydraulic fracking impacts overall. This study also used the conceptual formula Atatah known as Atatah's "Statistical Significant Differences Multiplier" (SSDM) as a way of 95% accuracies in estimating actual future occurrences and outcomes as a result of lack of transparencies in many organizations worldwide.^{5,6}

The design of the research study

The research study used a quantitative secondary data collected from Reporter Linker and Statista.com^{7,8} in 2024 to analyze two major data that statistics that posed two major hypotheses. This study collected secondary data statistics from both avenues that posed the actual two Alternative hypotheses as pinpointed below;

Alternative hypothesis 1: *H1*

There were/are significant correlations/relationships between the actual prices of a barrel of crude oil and the actual prices of a gallon gasoline prices Houstonians pay at the gasoline fueling stations.

Null hypothesis 1: *H0*

There were/are no significant correlations/relationships between the actual prices of a barrel of crude oil and the actual prices of a gallon gasoline prices Houstonians pay at the gasoline fueling stations.

Collections of secondary data in this research study

Variable, valid, reliable, and current secondary data was collected from Reporter Linker and Statista.com^{7,8} about the actual prices of a barrel of oil and the actual prices Houstonians and surrounding areas residences actually paid for a gallon of gasoline at the fueling stations between February 2023 and February 2024. The secondary collected data were fed into SPSS Version 27 for statistical analyses.

Interpretations of the results and the findings of the study

The study found that there were direct corrections/relationships between the actual prices and the actual prices Houstonians and surrounding areas' residences pay at the gasoline fueling stations. For example, whenever the prices of a barrel of oil drops, the prices of a gallon of gasoline remain the same; however, whenever there is a small insignificant increase in the price of a gallon of oil, the price of a gallon of gasoline increases almost immediately. Between February 2023 and March 2023, the price of a barrel of oil was up at 8%; and between March 2023 and April 2023 the price of a barrel of oil rose at 10.2% respectively. However, during same months, the gallon of gasoline in the fueling stations in Houston and surrounding areas rose at 5.9% and 2.3% respectively see Tables 1–6 and Figures 1–4 for more details. It should be noted that this was a slow driving months immediately after Christmas Holidays when everybody are tired of driving around aimlessly. Furthermore, the study found statistical significant differences of 100% for the prices of a barrel of oil between February 2023 and February 2024 and 100% for the prices of a gallon of gasoline Houstonians and surrounding areas' residences pay at the fueling stations; as such, the study accepted the Alternative Hypothesis and rejected the Null Hypothesis. The One-Sample Tests' Sig (2-tailed) is the same as the P. Value; which showed a statistical significance at 100% between the dependent and independent variables for the market standard price of a barrel of oil from February 2023 to February 2024, and the average price of a gallon of gasoline in Houston areas from February 2023 to February 2024. The Alternative Hypothesis stipulated and pinpointed that "There were/are significant correlations/relationships between the actual prices of a barrel of crude oil and the actual prices of a gallon gasoline prices Houstonians pay at the gasoline fueling stations." This means that regardless of how cheap the price of the barrel of oil was/ is the price Houstonians and surrounding areas' residences will pay higher at the fueling stations due to unchanged gasoline's prices.

Table 1 The market standard price of a barrel of crude oil & the average price of a gallon of gasoline in Houston and surrounding areas

	The market standard price of a barrel of crude oil from February 2023 to February 2024	The average price of a gallon of gasoline In Houston areas from February 2023 to February 2024
N Valid	13	13
Missing	0	0
Mean	82.3738	3.1062
Std. Error of Mean	1.54635	0.07128
Median	82.59	3.17
Mode	74.84a	3.29
Std. Deviation	5.57543	0.25699
Variance	31.085	0.066
Skewness	0.667	-0.795
Std. Error of Skewness	0.616	0.616
Kurtosis	0.081	0.04
Std. Error of Kurtosis	1.191	1.191
Range	18.88	0.88
Minimum	74.84	2.57
Maximum	93.72	3.45
Sum	1070.86	40.38

a, Multiple modes exist. The smallest value is shown

Showed maximum of 93.72 and 3.55, minimum of 74.84 and 2.6, in the prices of oil and gasoline with a Std. deviations of 5.6 and .26 respectively.

Table 2 The market standard price of a barrel of crude oil from February 2023 to February 2024

Valid	Frequency	Percent	Valid percent	Cumulative percent
74.84	1	7.7	7.7	7.7
75.47	1	7.7	7.7	15.4
77.63	1	7.7	7.7	23.1
78.43	1	7.7	7.7	30.8
80.11	1	7.7	7.7	38.5
80.12	1	7.7	7.7	46.2
82.59	1	7.7	7.7	53.8
82.9	1	7.7	7.7	61.5
83.48	1	7.7	7.7	69.2
84.64	1	7.7	7.7	76.9
86.15	1	7.7	7.7	84.6
90.78	1	7.7	7.7	92.3
93.72	1	7.7	7.7	100
Total	13	100	100	

Showed 100% cumulative frequency percentage with no missing numbers in the collected and analyzed data statistics.

Table 3 The average price of a gallon of gasoline in Houston areas from February 2023 to February 2024

Valid	Frequency	Percent	Valid percent	Cumulative percent
2.57	1	7.7	7.7	7.7
2.73	1	7.7	7.7	15.4
2.93	1	7.7	7.7	23.1
3	1	7.7	7.7	30.8
3.01	1	7.7	7.7	38.5
3.04	1	7.7	7.7	46.2
3.17	1	7.7	7.7	53.8
3.25	1	7.7	7.7	61.5
3.29	2	15.4	15.4	76.9
3.3	1	7.7	7.7	84.6
3.35	1	7.7	7.7	92.3
3.45	1	7.7	7.7	100
Total	13	100	100	

Showed 100% cumulative frequency percentage with no missing numbers in the collected and analyzed data statistics.

Table 4 One-sample statistics

	N	Mean	Std. deviation	Std. error mean
The Market Standard Price of A Barrel of Crude Oil From February 2023 to February 2024	13	82.3738	5.57543	1.54635
The Average Price of A Gallon of Gasoline In Houston Areas From February 2023 to February 2024	13	3.1062	0.25699	0.07128

Showed N is equal to 13, 13 and the mean of 82, 3.1 and Std. Deviation of 5.6 and .26.

Table 5 One-sample test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean difference	95% Confidence interval of the difference	
					Lower	Upper
The Market Standard Price of A Barrel of Crude Oil From February 2023 to February 2024	53.27	12	0	82.37385	79.0046	85.743
The Average Price of A Gallon of Gasoline In Houston Areas From February 2023 to February 2024	43.58	12	0	3.1065	2.9509	3.2614

Showed confidence Interval of the Difference lower levels of 79 and 3, upper levels of 86 and 3.3 with Sig. (2-tailed) of .000 and .000. The One-Sample Tests' Sig (2-tailed) is the same as the PValue; which showed a statistical significance at 100% between the dependent and independent variables for the market standard price of a barrel of oil from February 2023 to February 2024, and the average price of a gallon of gasoline in Houston areas from February 2023 to February 2024.

Table 6 One-sample effect sizes

	Standardizer ^a	Point estimate	95% confidence interval	
			Lower	Upper
The Market Standard Price of A Barrel of Crude Oil From February 2023 to February 2024	Cohen's d	5.57543	14.774	20.626
	Hedges' correction	5.95703	13.828	19.305
The Average Price of A Gallon of Gasoline In Houston Areas From February 2023 to February 2024	Cohen's d	0.25699	7.288	16.884
	Hedges' correction	0.27458	11.313	15.802

a, The denominator used in estimating the effect sizes.

Cohen's d uses the sample standard deviation. Hedges' correction uses the sample standard deviation, plus a correction factor. Showed standardizers of 5.6 for Cohen's and 6 for Hedges price of a barrel of oil and .26 for Cohen's and .27 for Hedges' no correction needed for the sample effects sizes.

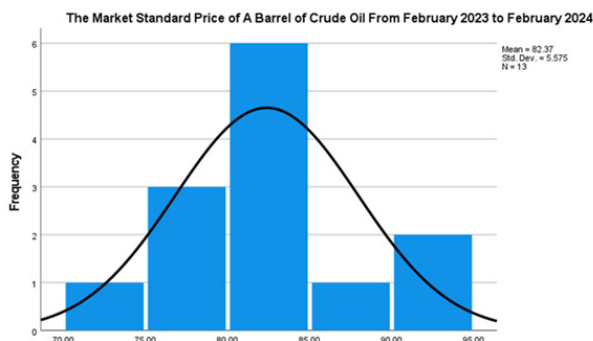


Figure 1 The market standard price of a barrel of crude oil from February 2023 to February 2024. Showed the mean of 82.4 for the actual market price of a barrel of oil, Std. Dev of 5.6 and no missing numbers.

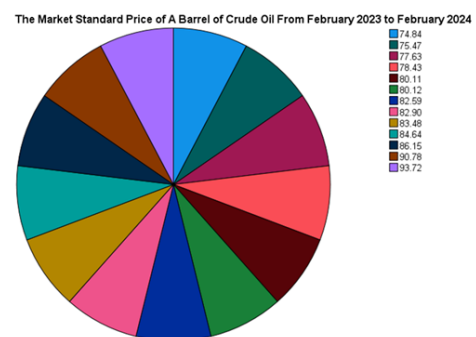


Figure 3 Color coded pie chart of the market standard price of a barrel of crude oil from February 2023 to February 2024. Color Coded example of a mean of 82.4 for the actual market price of a barrel of oil, Std. Dev of 5.6 and no missing numbers.

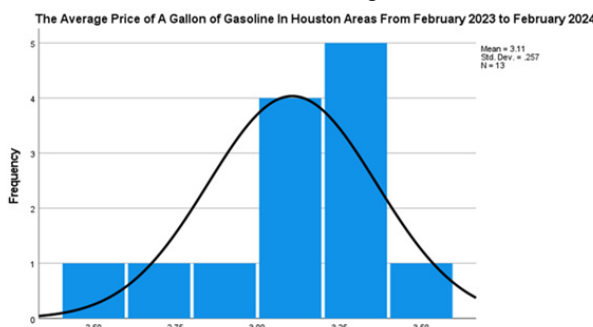


Figure 2 The average price of a gallon of gasoline in Houston areas from February 2023 to February 2024. Showed the mean of 3.11 for the average prices of a gallon of gasoline in Houston areas from February 2023 and 2024, with Std. Dev of .26 and no missing numbers.

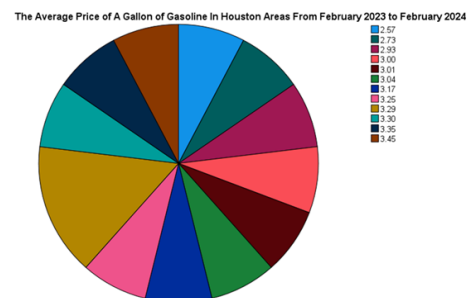


Figure 4 Color coded pie chart of the price of a gallon of gasoline in Houston areas from February 2023 to February 2024. Showed the mean of 3.11 for the average prices of a gallon of gasoline in Houston areas from February 2023 and 2024, with Std. Dev of .26 and no missing numbers.

Discussion and conclusion

Since 2020 when the relationships between the prices of a barrel of oil and the prices Houstonians and surrounding areas' residences pay at the fueling stations was investigated, there has been absolutely no change in the financial mentalities of OPEC policies' decisions-makers. This simply means that regardless of how cheap the price of the barrel of oil was/is the price Houstonians and surrounding areas' residences will pay at the fueling stations remain absolutely unchanged. For example, during the shutdown of exporting oil overseas between mid-2020 and early 2022 due to the effects of COVID-19 pandemic, the OPEC leaderships along with other international oil producing countries stored trillions upon trillions of barrels of oil in storages TANKS, hoping that the quarantines will end very soonest; however, the quarantines did not end as soon as they anticipated. As sad as it maybe, the quarantines anticipated ends' periods exceeded the oil companies decisions-makers assumptions, perceptions, and presumptions and they all abandoned the trillions upon trillions of barrels of stored oil, because it practically costs them more to pay for the storages fees that the contents and the contexts of the stored TANKS' oil. This is a good lessons learned and insights gained by the financial decisions-makers of all oil companies to analyze very closely.

This study will holistically cited the 2020 study by Kisavi-Atatah and Atatah's¹ discussions and conclusions for the OPEC countries as a yardstick to learn from because the minorities especially Blacks/African Americans in the Houston and other minorities in the surrounding areas are always affected harder than any other populations because the prices of every items increase daily and the salaries remain unchanged.¹ The OPEC countries along with other oil producing countries have yet again shown some forms of "Lack of Transparencies" which is detrimental to ordinary people worldwide.^{9,10} During the cause of this critical research study, we made a point of duty to visually investigate the differences in a gallon of gasoline in major four cities using Houston, Texas as the critical study's city. We found that a gallon of "Regular Unleaded" gasoline sold for \$3.25 in Richmond, Texas, \$3.15 in Sugarland, Texas, \$2.90 in Stafford, Texas, \$2.82 In Cypress, Texas, and \$2.72 in some fueling stations in Houston, Texas. More interestingly, all these cities are less than one mile apart from Houston, Texas. Also, these were the same popular fueling stations such as Shell, Exxon/Mobile, 7 Eleven, Kroger, Walmart, and Valero just to mention a few. The fundamental pressing question now becomes exactly how, when, and where do they generate these sick prices statistical significant indifferent prices from? This question may be answered in another follow-up research study in the future to come. In summing up and hopefully, this research study may bring some positive social changes to all Houstonians and surrounding areas' residences and possibly be young.

Recommendations to OPEC countries

Beside the recommendations of Atatah & Kisavi-Atatah to the OPEC countries the following recommendations should be considered as well as to refurbish the current OPEC entities.

- A. OPEC should know that no countries will survive excessively by simply dealing with one singularly item; as such, multiple investments diversifier is a must as to be financially sustainable.
- B. OPEC should learn from the lessons learned and insights gain in 1983 in Houston, Texas during the first historic oil failure; and Houstonians vowed never to make its source of revenues singular; thereafter, Houstonians developed some overwhelming diversities across the board.

- C. OPEC should and must learn how to use these trillions upon trillions of dollars earned or gained from oil to develop other financial entities that maybe financially overcoming and long-lasting.
- D. OPEC and petroleum engineers should and must learn how to "cut their coats according to their sizes" because overly spending in industries that are not yours, does not mean that you are successful; it only means that you may be riding on the shoulder of the successful owner of your company.
- E. OPEC should use the success of United Arab Emirates success, which was able to transform a previously desert by the seaside city Dubai into an international destination worldwide.
- F. OPEC should learn from the history and discoveries of hydraulic fracking in the USA which overnight made US the second largest oil producing country worldwide. This means US is no longer the largest oil importing country in the world; but, instead, China became number one importer, in this area of financial sustainability's competition.
- G. Finally, OPEC countries need to know that the world is changing; and, oil is discovered everyday worldwide, and as such, they should learn how to diversify their oil revenues into other profitable areas as to stay financially sustainable for a longer time to come.
- H. In summary, if majority of the OPEC countries review the Atatah & Kisavi-Atatah⁷ publication's recommendations, along with the newly recommended above items above about how to be systematically financially sustainable, OPEC should overcome its current financial in-sustainability issues if they are carefully implemented.
- I. Finally, OPEC countries should and must not use any misfortune created by natural or manmade disasters as yardstick of raising the price of oil immediately. Instead, these countries should and must study the general of these occurrences and use the lesson learned and insights gained from them as guidelines and moving financially forward systematically; as a way of permanently stabilizing the price of oil worldwide.

This quantitative research study strongly suggests that OPEC leaderships should and must learn from their previously failed economical financial applications which were/was/is historic; above all, OPEC should and must know that the prices of oil and gasoline were/are not permanent across the board. In fact, OPEC leaderships need to know that there are massive pushes for the manufacturing of Electric Vehicles (EV) among other machines just tom mention a few, and very soon GRUDE OIL will no longer be as valuable as OPEC leaderships assumed, presumed, and reassumed anymore and anywhere internationally.

Acknowledgments

None.

Conflicts of interest

The authors declare that there is no conflicts of interest.

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