Validity of CFTC COT Data for Trader Positioning in Oil Derivatives

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Executive Summary

The CFTC COT Report serves as a cornerstone in the oil industry, offering traders insights into market positioning on a weekly basis, with data reflecting activity from three days prior. While its reporting format following the disaggregation of the counterparties in 2009 remains instrumental in understanding market signals and differentiating between physical and financial flows, the dataset is insufficient to allow for accurate quantitative predictions.

The CFTC is limited in the information it reports, lagging in the coverage of evolving complexities of modern derivatives markets. For example, the Report only covers futures contracts and options on U.S. exchanges, excluding ICE RBOB Futures, OTC swaps from foreign exchanges and 1st line futures which represent an important part of the futures market risk, consequently leading a fragmented analysis. Furthermore, breaking down money managers' positions is crucial for understanding speculation within trading volumes. Money managers can be categorised into three main groups: CTAs, risk parity, and discretionary managers. By discounting CTAs, we can analyse the open interest volumes of the other two categories. Change in Net CTA positions accounts for approximately 28.3% of the change in net money manager positions, with a correlation of 0.58 from February 2022 to the present (Onyx CFTC, 2024).

To have an up to date, expansive interpretation of current trader positioning for the whole oil market, a more comprehensive dataset is required using supplemental third-party data. This white paper proposes integrating three datasets in combination with the CFTC COT Report: (1) ICE COT for European futures, (2) Managed Money breakdown into CTA positions using a 3rd party model (Bridgeton/INAS/Onyx), and (3) Onyx for OTC swaps.

We use Onyx's COT dataset, which classifies counterparties into 8 types and includes entry levels for short and long positions, to validate the usefulness of third-party data integration. Three case studies are examined covering EBOB crack May 2024, Naphtha crack May 2024, and Dubai swap July 2024. A classification model is also adopted to analyse the relationship between trader entry levels and price movements. The results show that an increase in the distance to entry prices correlates with higher volatility over the following 7 days.

CFTC Data

The Commodity Futures Trading Commission (CFTC) is a U.S. federal regulatory body which issues the Commitment of Traders (COT) report weekly. Released every Friday at 3:30 p.m. EST, this publication provides a snapshot of open interest positions for futures and options contracts as of the preceding Tuesday across various asset classes including commodities, FX, and equity (Hanna, 2023). The COT dataset, which began with a rudimentary classification of three counterparties, evolved in September 2009 to include five categories: Producer/Merchant/Processor/User, Swap Dealers, Managed Money, Other Reportables, and Non-Reportables.

While this structured data dissemination has been instrumental in understanding market signals and differentiating between physical and financial flows in market trading, it lags in the coverage of the evolving complexities of modern derivatives markets. For example, the dataset only covers futures contracts and options on U.S. exchanges, excluding ICE RBOB Futures and OTC swaps from foreign exchanges. While futures trading volumes are higher, swaps often surpass futures in open interest, revealing unreported market risk and sentiment. 1st line futures are also not present in the COT report despite representing a big part of the futures market risk, consequently suggesting a fragmented analysis.

Breaking down money managers' positions is increasingly crucial for understanding speculation within trading volumes. However, the CFTC COT lacks this insight. Money managers can be categorised into three main groups: Commodity Trading Advisors (CTAs), risk parity, and discretionary managers. CTAs, which include hedge funds managing various asset classes (including oil), are predominantly systematic or algorithmic traders. By discounting CTAs (trend followers with no directional bias), we can discern the tendencies in open interest volumes of other categories.

Through their trading activities in futures contracts CTAs impact market sentiment, liquidity, and price discovery. Although they might not directly trade oil swaps, their actions indirectly influence pricing dynamics in related markets, including OTC oil swaps, which the CFTC acknowledged of significant importance. They noted that non-commercial position open interest increased from 2.8 million to 5.03 million between July 1, 2014, and July 6, 2023 (Newman, 2023 – Page 219). This surge was largely driven by the pivotal event in 2012 when oil swaps were first listed on exchanges, leading to the rapid global adoption of exchange trading for oil derivatives.

While the CFTC COT report is indisputable useful in giving an overall picture of market positioning, it's predictive quality regarding price movements is limited. Studies for aggregated data, later followed by studies for disaggregated data have shown that little or no significant relation between positioning changes and price movements.

For example, Büyükşahin et al. (2011) argue on WTI crude oil futures that swap dealers can have net long positions in short-dated futures while being net short in longer-dated contracts, a complexity not captured in aggregate COT data (Büyükşahin et al., 2011). Further limitations are also noted by Robe and Roberts (2019), arguing that classifying counterparties into only five categories obscures important distinctions among trader types, hindering accurate analysis of speculative versus hedging behaviours. (Robe & Roberts, 2019).

Proposed Solution

Although the regulator provides a foundational picture of market positioning, it only goes so far.

Bridging the gap in differentiating between hedging and speculative positions in the professional oil community, we propose combining third party data with the CFTC COT report to quantify market psychology and predict future market conditions. The dataset we suggest utilising are:

1. CFTC COT Report for US futures.
2. ICE COT Report for European futures.
3. Bridgeton/ INAS /Onyx for Managed Money breakdown into CTA positions.
4. Onyx COT Data for OTC oil swaps.

Combining datasets offers a powerful analysis tool, enabling market participants to have an up to date, expansive interpretation of current trader positioning for the whole oil market.

Onyx COT Data

Onyx is a leading financial oil trading company and service provider specialising in oil swaps, with a 20% market share globally, and 34% in areas like Gasoline and Naphtha [for other products Onyx trades please see Appendix 1]. In 2023, Onyx traded $1.9 trillion worth of futures and derivatives.

While Onyx doesn't cover the futures and options market, it generates a proprietary dataset in oil swaps, which behaves like futures. This data, updated T-2 days, covers five oil products Onyx trades with counterparties via ICE, SGX, and CME: Crude, Gasoline, Naphtha, Fuel Oil, and LPG. Categorisation of the positioning is equivalent to the CFTC COT Report for easy comparison.

Onyx offers additional benefits with granular counterparty breakdowns into 8 categories: Majors/National Oil Companies, Trade Houses, Refiners, Producers, End Users, Banks, Hedge Funds, and Market Makers/Prop Traders. It also includes positioning by tenor, covering outright contracts, geographical spreads, time spreads, and entry prices for longs and shorts. This allows for a more precise view of market positioning by showing the price levels at which players entered trades. If prices diverge significantly from these levels, it indicates potential profit-taking or stopping out.

How to use Onyx

Below is the recommended general principle for using Onyx's COT data. By following these guidelines, one can maximise the utility of the data in capturing market psychology.

A Step-by-Step Guide to Analysing Trader Positioning Using Onyx's COT Dataset
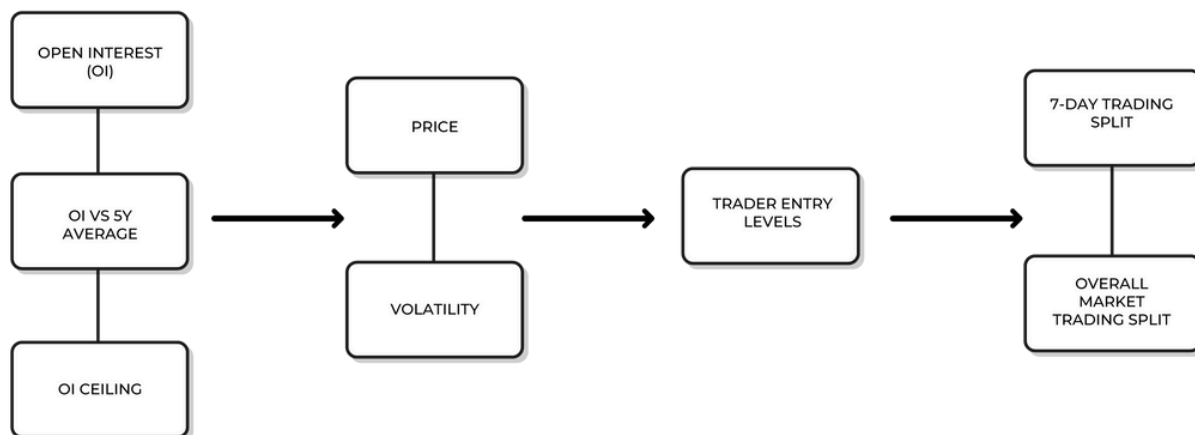
(Source: Onyx COT)

While OI provides an initial insight into the risk capacity cycle, comparing it to the 5-year average and OI Ceiling (comparison of current OI to maximum OI across prior 5 years) allows us to understand seasonal dynamics and saturation points. Analyzing price action and volatility as functions of price, reveals their link to risk capacity and historical trends. When these two blocks of data are combined to model trader entry levels, it simplifies the process of distinguishing stop outs and profit-taking behaviors of market participants. Lastly, analysing long/short ratios adds further context. Looking at the last 7 days trading split can indicate the first steps towards predicting a behavior, while the overall market trading split helps identify market directional risk and potential actions in physical pricing or vulnerabilities.

Analysis/Evidence

To confirm these claims, we have isolated three key examples as evidence: EBOB crack, Naphtha crack, Dubai flat price. The case studies are further validated through empirical evidence, focusing on variables such as entry prices, volatility, and positioning.

Case Studies

Case Study 1: Gasoline - EBOB Crack

The gasoline market is generally viewed as bullish, primarily driven by seasonal trends like summer driving season. However, from mid-April onwards, a notable sell-off was observed in RBOB, the US Gasoline benchmark. As macro-economic inflation fears were weighing managed money trimmed their long positions by 29,847mbbls, whereas shorts added lengths of 6,350mbbls from April 9th to May 7th.

We suspect that since commodities constitute only a portion of their portfolio, this was likely a rebalancing act. However, this action prompted CTAs to accelerate the downward trend hammering RBOB futures -please see appendix 2 (ONYX CFTC Report, Apr 29, 2024, Page 18). In addition, in line with the summer demand expectations we saw that the market was heavily skewed to the long side which let bearish sentiment to weigh in as market got quite vulnerable.

As RBOB futures prices began to decrease, bearish sentiment similarly affected EBOB (the European Gasoline benchmark), with paper players covering short positions as the physical arbitrage closed. The resulting buy side flows in the arb (the differential between RBOB and EBOB) therefore contributed to weakness in EBOB.

Nevertheless, there remains optimism. Despite the bears driving prices downward, continued buying flows suggest an anticipation of summer demand.
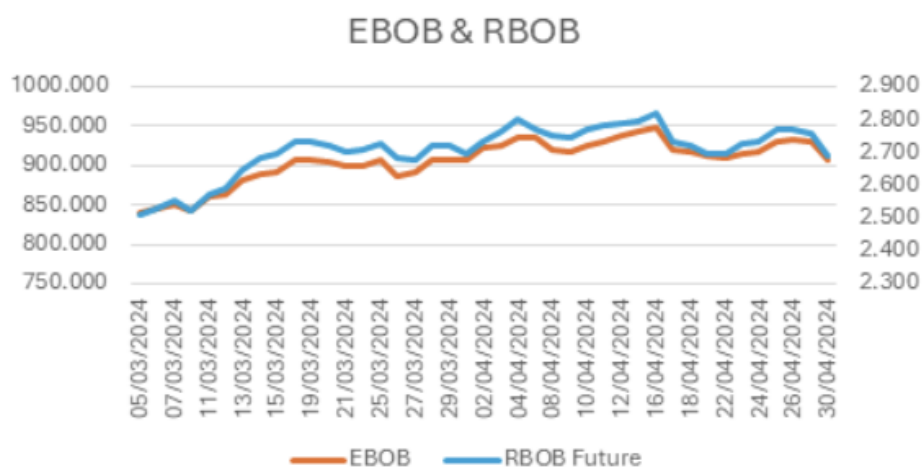
(Source: Onyx COT)

Contract analysed: EBOB Crack May24. Time frame: from April 1st, 2024, to April 30th, 2024

Given RBOB's typical correlation with EBOB, we noted corresponding selloffs in EBOB. Looking into the crack, we observed that before April market was positioned as long and it was getting longer. However, with May becoming the prompt contract Onyx Commitment of trader's data shows that selling flows overwhelmed the bullish sentiment. Though in the beginning the selling flow mostly came from refiners to hedge, with trade houses and hedge funds piling in their short positions the overall market trading split skewed to sell side.

Investigating this trend further, we observed OI starting to pick up and the market getting even shorter, suggesting players were re-entering the market and increasing their short positions. However, we continue seeing buying flows in Q3 in line with summer demand anticipation.

Where are we with the trend?

With the macroeconomic outlook impacting the futures market and RBOB being hammered through screen selling, we witnessed a reversal in prices, driving them lower. Anticipating ongoing inflationary concerns alongside a weak macroeconomic backdrop and further weakness in EBOB, we believe we may be witnessing the start of a downward trend. However, we advise monitoring incoming buying flows for Q3 demand. While Brent weakness also factors into this equation, we anticipate that the weakness in EBOB will outweigh any impact from Brent, particularly as hedging flows exacerbate the downward trajectory.

Physical Outlook

Considering the bearish sentiment influenced by refinery margins coming under pressure as inventories deplete slower than normal for this time of the year, we expect the sentiment to persist in May. Consequently, selling time spreads for a safer view is suggested.
However, with the continued buying flow in Q3 which corresponds in the summer months, we advise we advise being vigilant against a possible sentiment shift.

Conclusion

Onyx's COT dataset, with its detailed breakdown of counterparties and entry levels, has significantly enhanced our ability to construct a clearer and more nuanced understanding of the Gasoline market. CTA model, coupled with access to granular datasets—including detailed spreads and cracks—has been instrumental in accurately assessing the depth of the market sell-off and determining our position within the prevailing trend.

Case Study 2: Naphtha – Naphtha Crack

Since the inclusion of WTI in the Dated Brent complex, the US crude export grade has often set the price for Dated Brent. Due to its light sweet properties and yielding more Naphtha, the Naphtha market has become increasingly connected to the dynamics of the Dated Brent market.

Although the Naphtha market has typically been overshadowed by bearish trends, the first half of April 2024 saw this sentiment intensify even further. This was primarily driven by weak Chinese petrochemical demand and an oversupply in Europe, where strong gasoline cracks led refineries to favour gasoline output in the Middle East and US Gulf Coast (USGC). Concurrently, the return from refinery maintenance and strong Brent performance contributed to poor cracking margins. Furthermore, a dramatic $4/bbl drop in prices in a single day triggered stop-outs, pushing naphtha prices even lower. As a result, physical and paper traders—including trade houses, majors, and funds—increasingly took short positions.

However, in the second half of April, we witnessed a turnover as the simple refinery margin went into negative and straight run products like naphtha more bid. Furthermore, ADNOC's shift in its Ruwais refinery operations from refining naphthenic Murban crude to heavier, sourer Upper Zakum crude also contributed to bullish sentiment. This transition reduced the production of naphtha as a byproduct, constricting its market supply.
Since market players got too short too soon, they found themselves covering their positions as the anticipated supply in the East did not materialise (Onyx Trader Meeting Notes, May 2024, Page 10).

This shift in sentiment supported prices, leading to a rally in Naphtha cracks. This rally, however, lost momentum as substantial selling emerged. It is important to note that despite the selling activity causing price volatility, its overall impact on prices remained marginal due to robust buying in Q3 and Q4.

Contract analysed: Naphtha Crack May24 from April 1st, 2024 to April 30th, 2024

Further investigation revealed that the selling flow for May Naphtha cracks was present starting from the beginning of the month. Though we saw refiners flipping their net positions from short to long towards mid-April. Majors, trade houses and hedge funds continued to add length to their short positions. This highlights a possible battle lead by trade houses and majors, whilst hedge funds trying to take profit.

Despite this selling pressure, prices rebounded starting from mid-April increasing from - $12.70/bbl to -$9.25 /bbl, strengthened by refinery buying activity (416,400bbl). Refiners secured Naphtha for Q3 in anticipation of rising cracking demand while trade houses continuously added length to their positions in Q4, outweighing front-month selling and maintaining price support. The bullish sentiment was also supported with Majors weighing in the buyside for NWE (Northwest Europe Naphtha benchmark) and MOPJ (Asian Napha benchmark) suggesting a potential shortage of a cracker grade.

Where are we with the trend?

Considering significant selling pressure observed at the front end of the curve, a decline in prices was anticipated. However, an upward trend in prices was observed. Starting mid-April prices rose from -$12.70/bbl to -$9.15/bbl. Although Q3 and Q4 cracks initially drove prices up, the recent decrease to -$9.25 on April 30 indicates a possible trend reversal. Selling flows in the last seven days for Q3 suggest that bearish sentiment may now outweigh buying activity at the back end of the curve.

Physical Outlook

Despite initial strength led by a supply tightness, the rally seems to have reached an apex moving towards a downtrend in line with positive CDU refinery margins. Consequently, it is suggested shortening time spreads. In this instance, time spreads represent a more optimal trading strategy compared to an outright crack spread since time spreads are explicitly linked to the fundamentals of the refined product itself, while crack spreads are influenced by crude.

Conclusion

Having a breakdown tenor by tenor and more extensive counterparty type data enabled us to identify the sources of price support by examining the flows by month in the forward curve showing how granularity can be incremental to have a clearer understanding of the market. Being able to differentiate between flows allowed us to determine where we were with the trend as it signalled that as hedging flows would diminish, and the support would not be persistent.

Case Study 3: Crude – Dubai Swap

The Dubai crude oil market is pivotal in reflecting the medium-sour crude dynamics between Asia and the Middle East. Since its rise to prominence in 2009, Dubai crude has become a crucial benchmark for Asian refineries, aligning with the region's increasing energy demands. Historically, medium-sour crude grades like Dubai were priced lower than light-sweet crudes such as Brent due to their higher sulphur content and lower quality. However, following OPEC's production cuts in 2023, this spread reversed, entering an unprecedented negative territory.

Two key events have driven the Brent/Dubai spread into this unusual territory: OPEC cuts and the inclusion of WTI Midland in the Dated Brent benchmark. A narrow Brent/Dubai spread implies open arbitrage between the Atlantic Basin (US and North Sea crude) and Asia, making these crude grades competitive for Asian refineries, which reflects the global sweet-sour crude dynamics between Asia and Europe.

Between May 20th and June 19th, 2024, the Dubai crude market experienced notable fluctuations, shaped by complex interactions of supply and demand dynamics along with financial flows. Open interest trends revealed shifts in trader sentiment, while price volatility reflected the market's response to both regional and global events. This case study aims to provide a comprehensive analysis of the Dubai crude oil market, highlighting the intricate mechanisms that drive its pricing.

Contract analysed: ICE Dubai July 24 - Time frame: from May 20th , 2024, to June 19th , 2024

Until the beginning of June, the Dubai crude market remained rangebound, outperforming Brent in terms of relative value. This relative strength was underpinned by fundamental support from OPEC+ amid rumours of continued output cuts extending into the third quarter. Additionally, ADNOC's Ruwais refinery shifted from sweeter Murban to sourer Upper Zakum crude, tightening sour crude market fundamentals as ADNOC aimed to increase exports of its flagship Murban crude. Consequently, the official selling price for Upper Zakum in June was set at a 60-cent premium to Murban, the highest level ever recorded.

However, this upward trajectory was subsequently reversed due to a general weakening in the crude oil market, compounded by OPEC+'s announcement to extend production cuts until September 2024. The announcement also included indications of a possible production increase in the fourth quarter, contributing to the decline in crude prices.

After the 4th of June market sentiment for crude grades improved, alongside with OPEC+ suggesting they might not be bringing barrels back, which created an additional support for Dubai. Despite seeing significant selling by trade houses from mid-June, a closer examination of Onyx's COT data reveals these were likely profit-taking actions.

Where are we with the trend?

We are approaching the end of an upward trend. With Dubai spreads being offered amid arbitrage opportunities to the East, the Dubai complex appears to be reaching a resistance level. While the indication of not bringing barrels back supports Dubai prices, we expect the momentum to slow down, resulting in more rangebound trading.

Physical Outlook

OPEC+ signalling that they might not bring barrels back keeps the pressure on supply. However, the availability of cheaper cargoes from the Atlantic Basin, which allows for arbitrage opportunities to the East, has decreased the demand for Dubai crude. Despite the ongoing supply pressure, we expect Dubai to maintain its strength, though with reduced momentum, as Asian refinery margins remain relatively weaker compared to those in Europe.

Conclusion

Access to more granular data has allowed us to gain a clearer understanding by distinguishing stop-outs. Furthermore, with a breakdown by tenor, we have been able to identify the specific sources of market support. Having detailed information on counterparty types for both Dubai and Brent/Dubai contracts also helped us to better quantify the market sentiment in determining the trend and physical outlook.

Empirical Analysis

The following section examines how the distance between entry levels and current prices can signal an upcoming move in 7-day future volatility using a scatter plot with a fitted linear regression. This approach provides insights that cannot be derived from the CFTC reports alone, as they do not include entry prices and real-time-data, potentially influencing market psychology.

Data Analysed: M1 to M4 starting from 2018 for EBOB Crack, Naphtha Crack, Naphtha East West, Brent/Dubai.

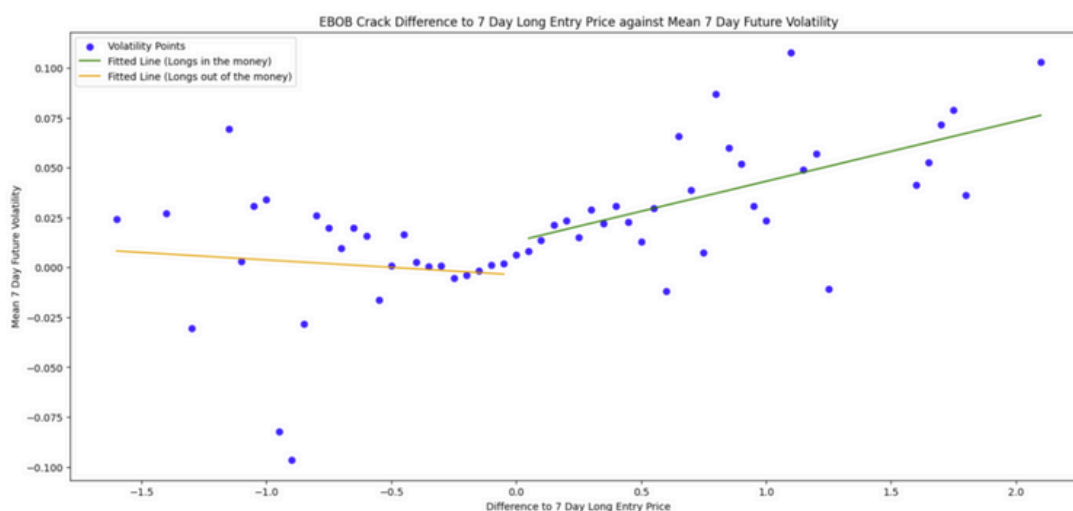Figure 1: M1 to M4 starting from 2018 for EBOB Crack

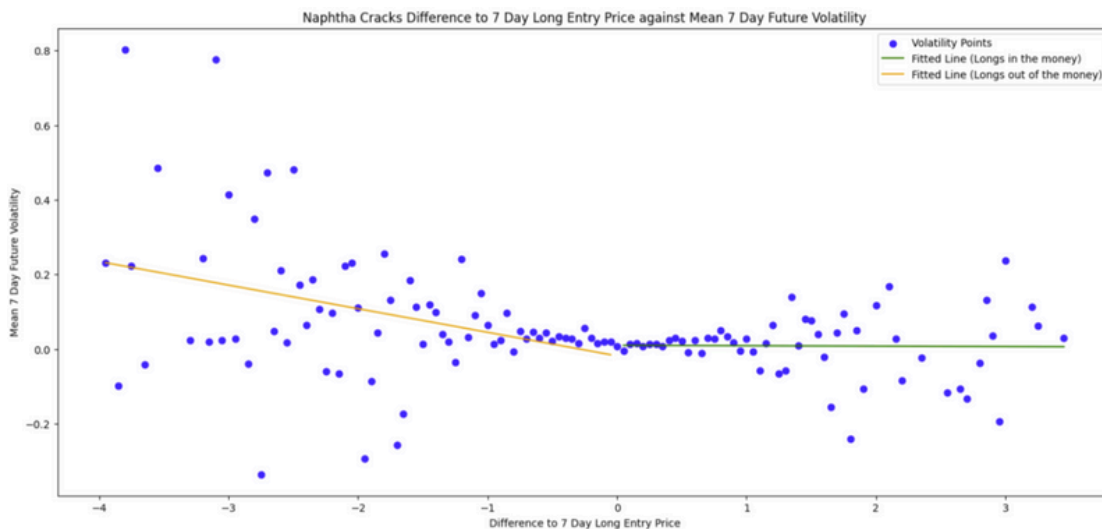## Figure 2: M1 to M4 starting from 2018 for Naphtha Crack

Naphtha Cracks Difference to 7 Day Long Entry Price against Mean 7 Day Future Volatility

Figure 3: M1 to M4 starting from 2018 for Naphtha East West

Naphtha EW Difference to 7 Day Long Entry Price against Mean 7 Day Future Volatility
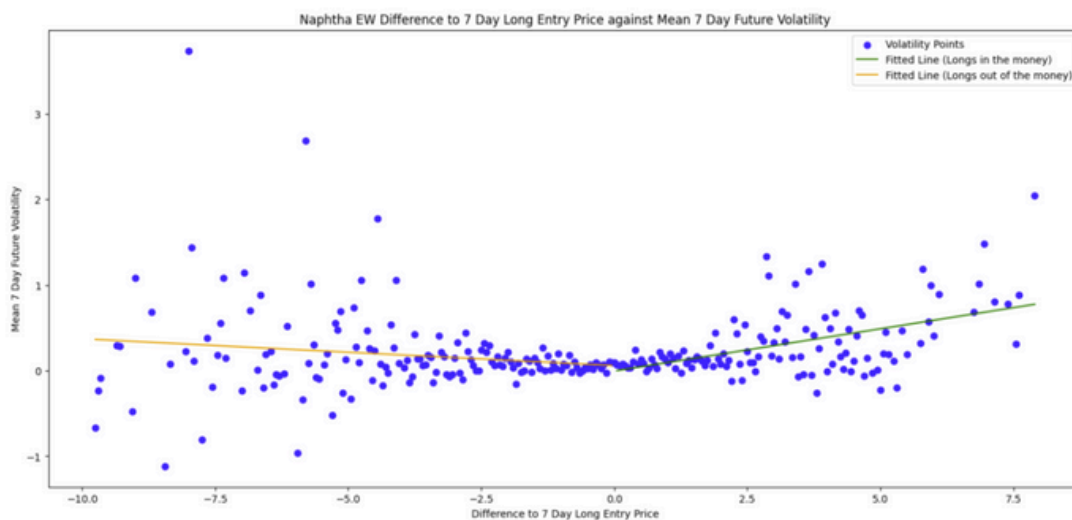
Figure 4: M1 to M4 starting from 2018 for Brent/Dubai

Brent Dubai Difference to 7 Day Long Entry Price against Mean 7 Day Future Volatility

Data Methodology

A classification model has been utilised, using entry prices and volatility as input metrics. The model was trained on data from January 1st, 2020, to January 1st, 2023. It was then run on data from January 1st, 2023, to May 29th, 2024, covering M1 to M4 contracts for EBOB Crack, Naphtha Crack, Naphtha EW, and Brent/Dubai.

The formulas used for calculating entry prices and volatility are as follows:

$$Entry\ Price = \frac{Mean\ Long\ Value}{Mean\ Long\ Volume}$$

$$Volatility = \frac{7-day\ Rolling\ Volatility}{25-day\ Returns}$$

Steps for Calculating Entry Prices

1. Filter Volume Where OI is Decreasing:
Discard the volume of contracts where the open interest (OI) is decreasing.

2. Calculate Positive OI Volume:
Identify the volume where OI is positive, indicating that people are entering the market.

$$Positive\ OI\ Volume = \sum(Volume\ of\ Contracts\ where\ OI\ is\ increasing)$$

3. Determine Long/Short Volume Proportion:
Calculate the volume of transactions where you are long (long volume) and where you are short (short volume). This is done based on the proportion of OI corresponding to long and short positions.

$$Long\ Volume = Position\ OI\ Volume \times Proportion\ of\ Long\ Positions$$

$$Short\ Volume = Position\ OI\ Volume \times Proportion\ of\ Short\ Positions$$

4. Adjust by Price
For the long volume, multiply the positive OI volume by the transaction prices where you are long.

$$Value\ of\ Long\ Positions = \sum(Long\ Volume\ x\ End\ of\ Day\ Price)$$

$$Value\ of\ Short\ Positions = \sum(Short\ Volume\ x\ End\ of\ Day\ Price)$$

5. Calculate Averages

Compute the average change in volume and the average change in value (total value of transactions).

$$\text{Average Change in Volume} = \frac{\sum(\text{Change in Volume})}{\text{Number of Periods}}$$

$$\text{Average Change in Value} = \frac{\sum(\text{Change in Value})}{\text{Number of Periods}}$$

6. Compute Mean Values

Calculate the mean value for long positions and short positions.

$$\text{Average Change in Value} = \frac{\sum(\text{Change in Value})}{\text{Number of Periods}}$$

$$\text{Mean Short Value} = \frac{\text{Total Value of Short Positions}}{\text{Number of Short Positions}}$$

7. Calculate the Entry Price:

Compute the price using the mean long value and mean long volume.

$$\text{Entry Price} = \frac{\text{Mean Long Value}}{\text{Mean Long Volume}}$$

Findings

Our analysis shows a clear correlation between the distance from entry prices and future volatility for both long and short positions. Specifically, as the distance from entry prices increases—whether in the money or out of the money—future volatility tends to rise. This trend is prominent in the Naphtha crack example and Brent/Dubai spread.

We observed that when market participants are significantly away from their entry prices on an aggregate basis, it implies higher volatility. This relationship is consistent for both long and short entry prices. However, this effect is most pronounced at the extreme ends of the data distribution, where volatility increases substantially with greater distances from entry prices. Although data in these tails are sparse, the trend is clear when aggregated on a large scale.

Additionally, we focused on the relationship between the distance to 7-day entry prices and future volatility. The data reveals a small but significant trend: an increase in the distance to entry prices correlates with higher volatility over the following 7 days. This effect is most evident in the extreme ends of the data, where noise is present, but the trend remains discernible.

Moreover, we examined the connection between the distance to entry prices and the time to expiry, given that volatility is known to be a strong function of time to expiry. Our review found little correlation between these two variables, suggesting that the distance to entry prices is a more critical factor in predicting future volatility.

In summary, while the CFTC COT data provides foundational insights into market positioning, incorporating entry prices and real-time data enhances our understanding of market psychology and potential future volatility. This granular approach enables more precise forecasting, especially in highly volatile markets.

Limitations of Onyx's Dataset

The historical data on market positioning provided by Onyx is confined to records commencing from 2020, with classifications of counterparties only being introduced in June 2023. The limited data history poses challenges for running comprehensive models. Our model tends to perform better in predicting market movements when prices deviate significantly from entry points, indicating a bias towards higher volatility the further the prices move from these initial levels.

Onyx's dataset does not fully represent the entire market, it only reflects the activities of participants trading with Onyx. To provide a broader market outlook, we have combined this data with that of other market makers, extrapolating based on the assumption that their trading styles are similar [for total market makers' market share for each product basket, see the appendix 1].

Conclusion

This white paper assessed the CFTC COT Report's effectiveness in analysing market positioning in the oil derivatives complex. While counterparty desegregation improved clarity, the Report remains limited in the information it presents, lagging in the coverage of evolving complexities of modern derivatives markets.

To improve predictive accuracy related to price and volatility, a more comprehensive dataset is required using supplemental third-party data. Analysis showed that integrating Onyx's proprietary COT data, which classifies counterparties into 8 types and includes entry levels for short and long positions, strengthens overall trader positioning analysis while providing
provides a fuller picture of differentiating between physical and financial flows.

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Appendix

1. MARKET MAKERS - PERCENTAGE OF MARKET SHARE OF OTC SWAPS

North Sea Crude
- Onyx – 25%
- Others – 44%

Total = 69%

Dubai Crude
- Onyx – 15%
- Others – 28%

Total = 43%

Gasoline
- Onyx – 34% (Strong in EBOB, 35%; EBOB crack, 38%; 92 Crack, 40%, Gasnaph, 66%).
- Others – 15% ~25%

Total = 59% European contracts
Total = 49% Asian contracts

Naphtha
- Onyx – 33% (Strong in MOPJ crack, 52% and Gasnaph, 66%).
- Others – 33%

Total = 66%

Fuel
- Onyx – 9.4% (Strong in 180 = 27%)
- Others – 43%

Total = 52.4%

LPG
- Onyx – 26%
- Others – 30%

Total = 56%

Appendix

2. CTA NET POSITIONING (bbls) - ONYX CFTC REPORT, APRIL 29, 2024, PAGE 18

Onyx's in-house CTA positioning model determines the net positioning of CTAs in a range of futures benchmarks.

CTA Net Positioning (bbls)