Milestone Report Draft

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TABLE OF CONTENTS

[1. Identify Influential Variables / Factors 1](#_Toc93440478)

[1.1. Price Movement & Volume as a Result of the Event 1](#_Toc93440479)

[1.2. Implied Volatility Change As a Result of The Event 2](#_Toc93440480)

[1.3. Limitation & Challenges 2](#_Toc93440481)

[2. Analyse the Effect of Influential Variables Over Time 2](#_Toc93440482)

[2.1. Variable’s Effect Over time 2](#_Toc93440483)

[2.2. Limitation & Challenges 2](#_Toc93440484)

[3. Summary & Moving Forward 3](#_Toc93440485)

[3.1. Summary 3](#_Toc93440486)

[3.2. Suggestions & Considerations 3](#_Toc93440487)

[3.3. Moving Forward 3](#_Toc93440488)

[4. References 3](#_Toc93440489)

# 1. Identify Influential Variables / Factors

## 1.1. Price Movement & Volume as a Result of the Event

The figure 1.1. shows that variables like FOMC Press Conference, OPEC Meeting, ISM PMI Manufacturing reporting day, and Black Friday and Cyber Monday period seem to play an influential role on specific sector ETFs.

The t-score we used to measure price change doesn’t take direction into account as we are only interested in the magnitude of price change and not the market sentiment on the outcome whether it’s positive or negative. And we only measure the effect on the day the event occurs, not including the day after. Here are some of the findings we have garnered.

First is FOMC Press Conference. The primary objective of the conference is to continually optimise the monetary policies to address the current economic challenges related to employment, inflation, growth, demand, and money supply (APA, …). We find that all the 11 sectors are quite sensitive to the outcome of the FOMC Conference on that particular day with an average magnitude of 1.0 t-score (one standard deviation) on price change (figure 1.2.). The volume also tends to rise above the median on this day according to figure 1.3., which means more participants tend to involve in the market during the specific event.

Second comes the OPEC Meeting. The objective of OPEC is to coordinate petroleum policies among countries that are chosen to be part of OPEC member, to ensure optimal production and supply, hence stable oil price (APA, …). And, according to our findings, the outcome of the OPEC Meeting on that day seem to have an influence on sectors like materials, energy, financial, technology, utilities, and staples with an average magnitude of 0.9 t-score (figure 1.2.). It is not surprising to see the influence of petroleum policies on sectors like materials, energy, and utilities since they are related to oil production, equipment, transportation of materials, shipping, and power supply. However, it’s would be interesting to investigate sectors like staples, financial, and technology to validate the effect. Similar to FOMC, the volume tends to rise above the median on this day (figure 1.3.).

The ISM PMI manufacturing reporting day also tends to have greater price movement for materials and industrial sectors with an average of 0.9 t-score (figure 1.2). ISM PMI report is a leading indicator that surveys the future prospect related to manufacturing. The effect is less about the reliability of the survey, but more on the response of the market towards the report. It’s not difficult to map the relationship here since materials and industrials sectors are related to manufacturing by nature.

Another interesting variables / factors are Black Friday and Cyber Monday. Our expectation is that events are more likely to affect retail, staples, and discretionary sectors although the findings show an otherwise result. However, this is just a high level analysis using t-score to measure the price movement. Furthermore, energy sector tends to have higher beta or price movement than other sectors. Nonetheless, supply chain and logistics do play a major role during events like these, thus the effect on the energy sector could be due to the demand and supply for oil, plus market reaction on those days.

## 1.2. Implied Volatility Change As a Result of The Event

We also validate the price change by measuring the changes in VIX (implied volatility index) to see if the price movement is also supported by a significant change in implied volatility. Based on (figure 1.4.), we find that only FOMC Conference tend to move the VIX by around 1 standard deviation on average (0.9 t-score), followed by OPEC with 0.8 of t-score, while the rest is below 0.8.

## 1.3. Limitation & Challenges

We are aware, however, that the variables we identified above based on the t-scores are only around 0.2 higher than the rest, which can likely be due to random effect. Likewise for VIX. And, some events have limited sample size since they occur once a year.

Also, since the data can only measure the price change between the previous and current day closing price, we have essentially ignored the narrower timeframe such as price change between the market hours. Price can fall or rise a lot after the result is released or an announcement, and retract after the market has cooled down within hours. Hence, the effect can be watered down. Likewise for VIX.

Furthermore, the analysis doesn’t take omitted variables, uncertainty measure, and confounding variables into account. Plus, some variables / factors might allude to an uptrend or downtrend with longer days as a result of the outcome even though the price movement is small, but we are only measuring the price movement on a very short duration.

It is purely a high level scanning and analysis for variables that seem to stand out among the rest for further investigation in the future. Hence we decide to emphasise them.

# 2. Analyse the Effect of Influential Variables Over Time

## 2.1. Variable’s Effect Over time

We are interested to observe the effect over time to analyse the sustainability of the effect across time and impact during specific period such as recession after narrowing down our focus to specific variables.

As we observe figure 2.1., we find that the price movement on the ISM PMI Manufacturing reporting day tends to be larger a few years before and during the recession as most of the dots fall outside the t-score range between -1 to 1. We highlight the range with rectangular boxes. This outcome could be due to materials and industrials sectors becoming more reactive to the ISM PMI result (leading indicator for manufacturing) as the economy is falling from the peak or approaching a recession.

The same scenario occurs for Black Friday (figure 2.3.), where the price movement seems to increase during the recession (refer to the grey box) while the other periods have narrower movement.

## 2.2. Limitation & Challenges

Since we can only gather data from a very limited time range for both the ETFs and events, we aren’t able to compare the price movement on multiple recessionary period to observe the consistency. However, when we compare it with other sectors for ISM PMI, materials and industrial sectors seem to show an increasing price movement during the recessionary period compared to other sectors (figure 2.2.).

Also, the volatility is generally higher during the recessionary period, so the movement is likely to be magnified for other observances or events, which makes effect from ISM PMI and Black Friday less impactful.

# 3. Summary & Moving Forward

## 3.1. Summary

We narrow down to FOMC Press Conference, OPEC Meeting, ISM PMI Manufacturing reporting day, and Black Friday and Cyber Monday period after identifying the variables with high average price movement.

As we analyse the effect over time, we find that price movement during the FOMC, OPEC, and Black Friday event day is magnified during the recession. Likewise for ISM PMI. However, materials and industrials sectors seem to become more reactive to ISM PMI with increasing price movement as the economy is falling from the peak or approaching a recession.

## 3.2. Suggestions & Considerations

Days like FOMC Conference, OPEC Meeting, ISM PMI Manufacturing reporting day, and Black Friday and Cyber Monday period tend to be more volatile. With that, we have 3 considerations.

1. Traders can exit their position days before the event occurs to avoid volatile period if the market reaction and price movement is unpredictable.
2. If traders were to hold their position during those period, they may consider hedging to protect profits or mitigate losses until the dust is settled.
3. Volatile days can be a profitable also if traders aren’t trading the direction but price movement. Meaning prices can either move up or down as long as the movement is large enough to secure an attractive profit. However, if the movement is small, trades might suffer losses due to example like time decay if it’s an option trade.

## 3.3. Moving Forward

We look forward to analyse the hourly price movement for specific variables / factors mentioned above. As mentioned, certain events may cause significant price movement within hours, but retract after the market has cooled down. If the result does present a significant movement, it might offer an opportunity to trade the volatility depending on the context for that day.

To measure the hourly movement, we need to get our hand on hourly market data and compare the movement over multiple years, period, or economic cycle. After identifying the period and average price movement, we can then find out the context to construct the narrative and reasoning.

# 4. References

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