Volatility Arbitrage & Hedging

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Agenda

❖Equities

❖Thesis

❖Strategy

❖Prices of Our Positions

❖Greeks

❖Data Collection

❖Reflection/Future Improvements

❖Q&A

The Underlying Equities

- Walmart & Dollar General (WMT/DG)

  o Minimal volatility

  o Within the same sector ("On the Shelf Stocks")

- Diverging Fundamentals

  o DG has been falling for the past 2 years

  o WMT continues to beat earnings expectations

- Earnings Report Timing

  o DG Reports Earnings on 12/5/2024

  o WMT Reported on 11/19/2024 and we are projecting it will continue to rise
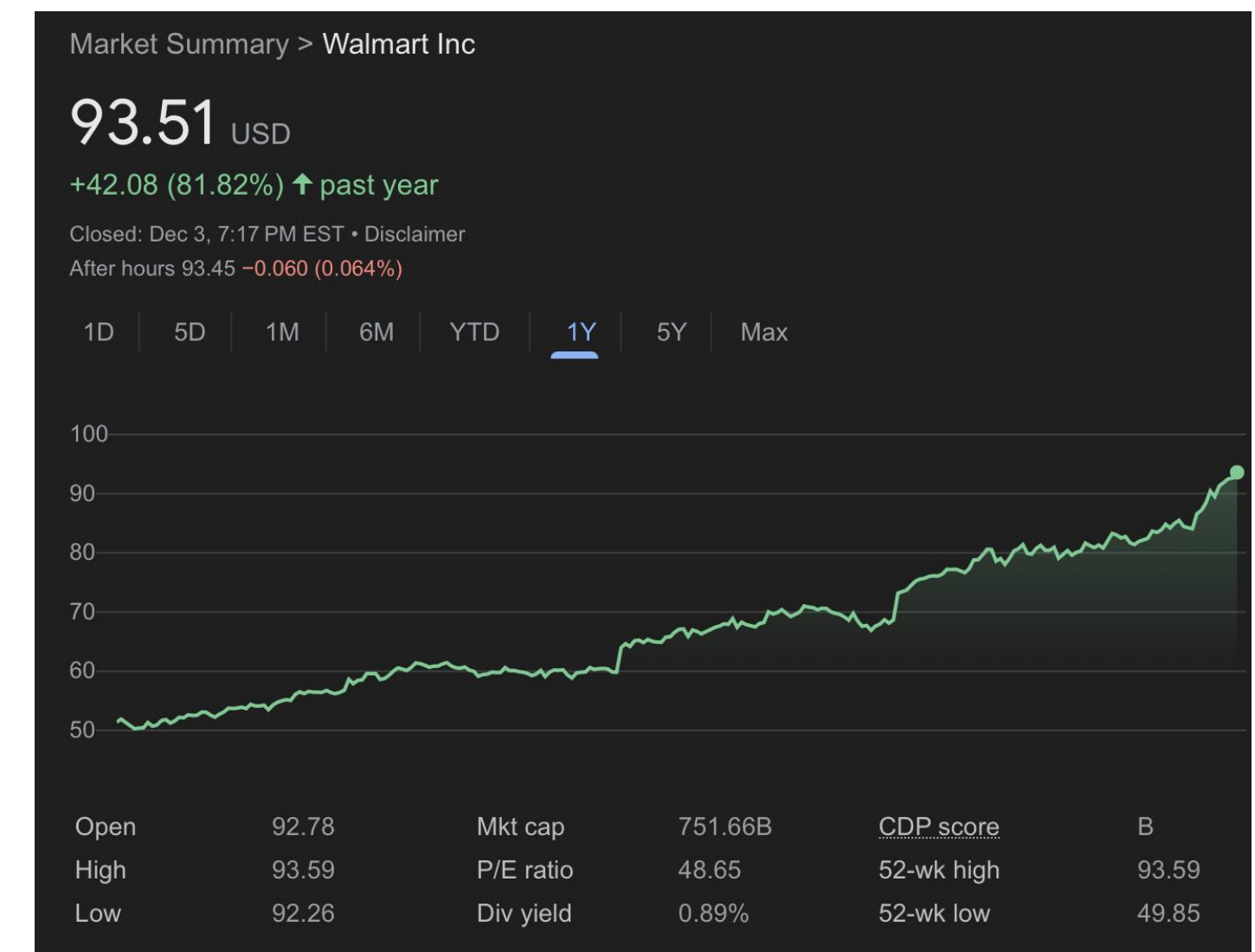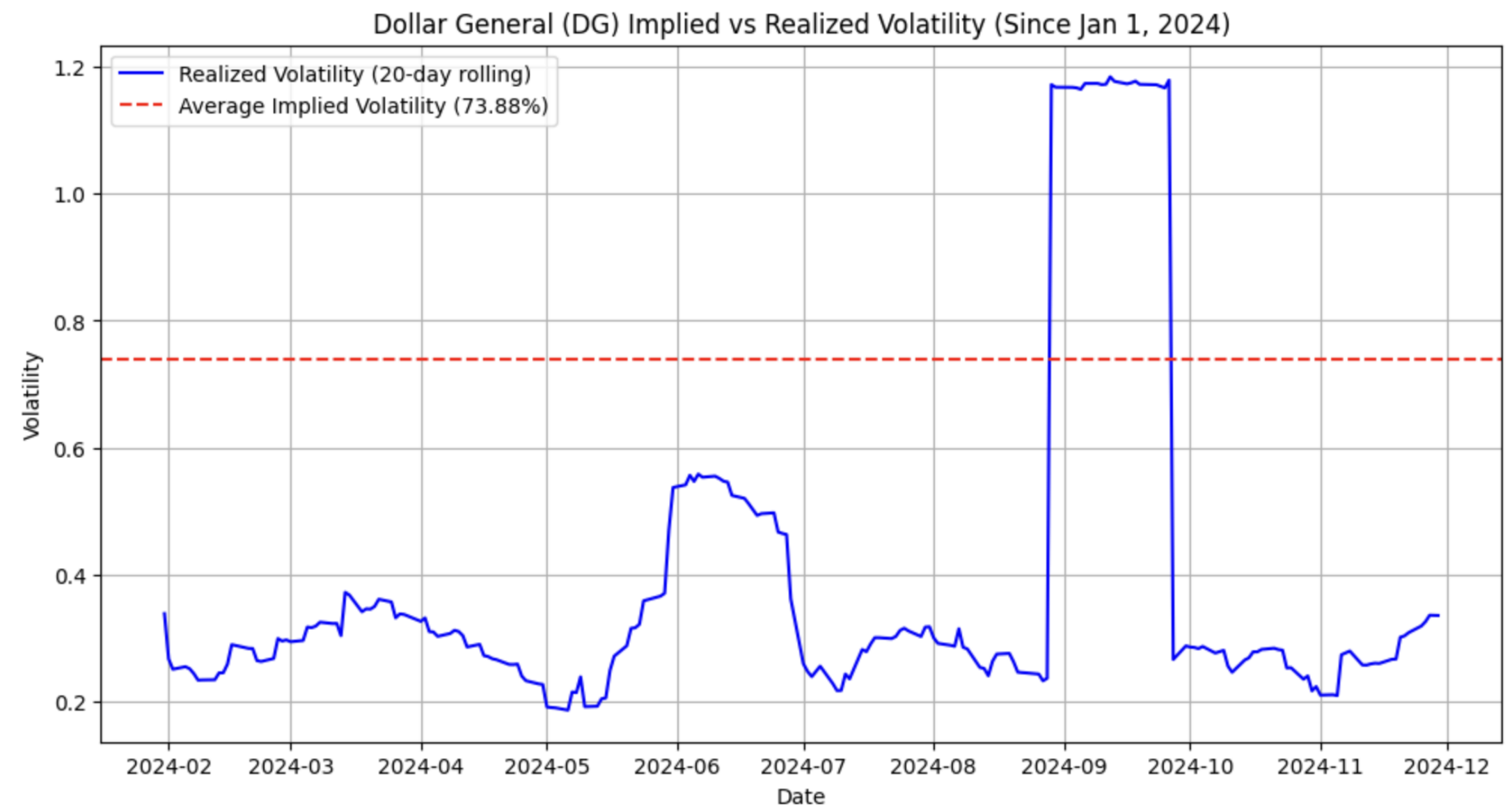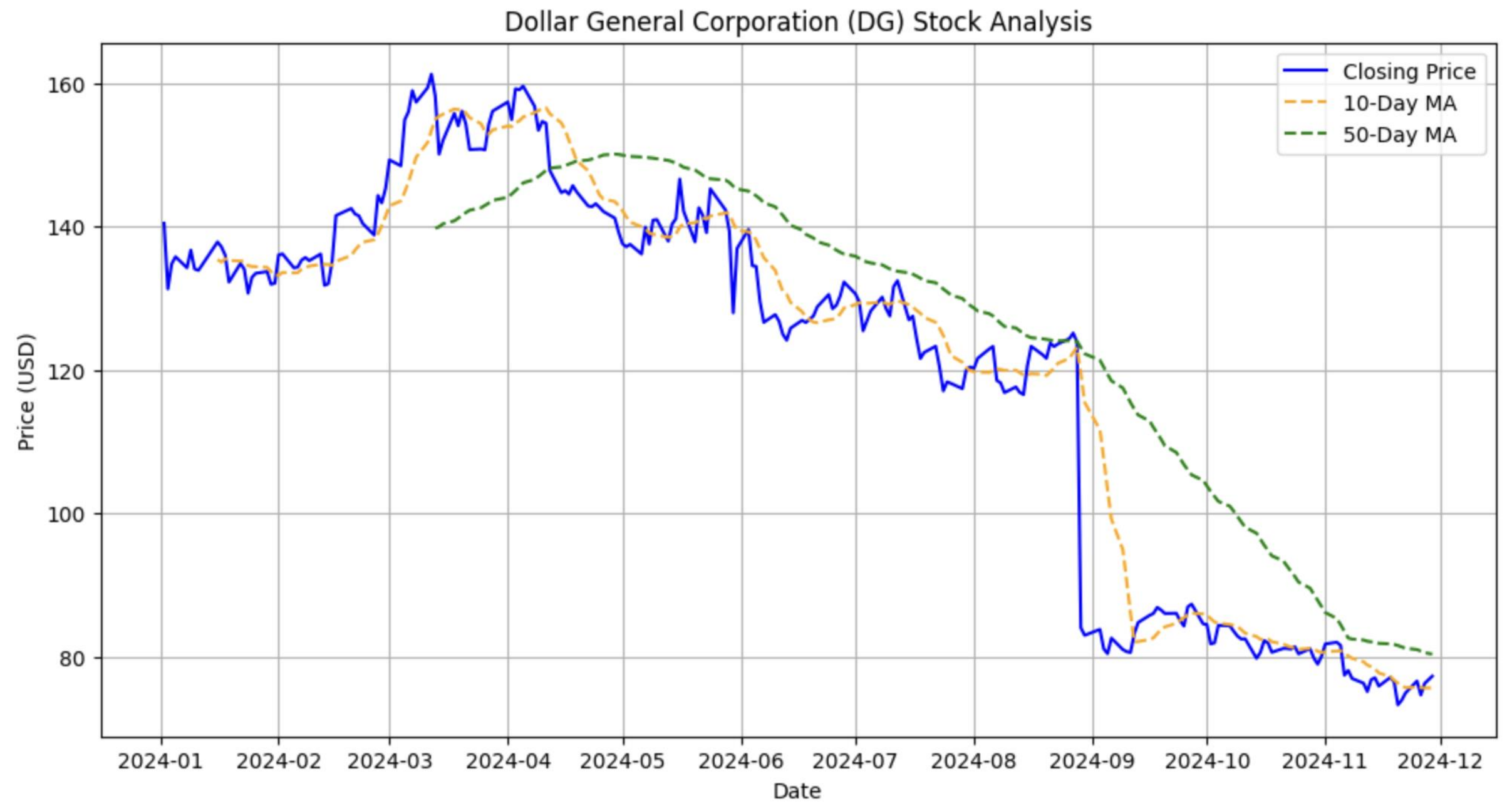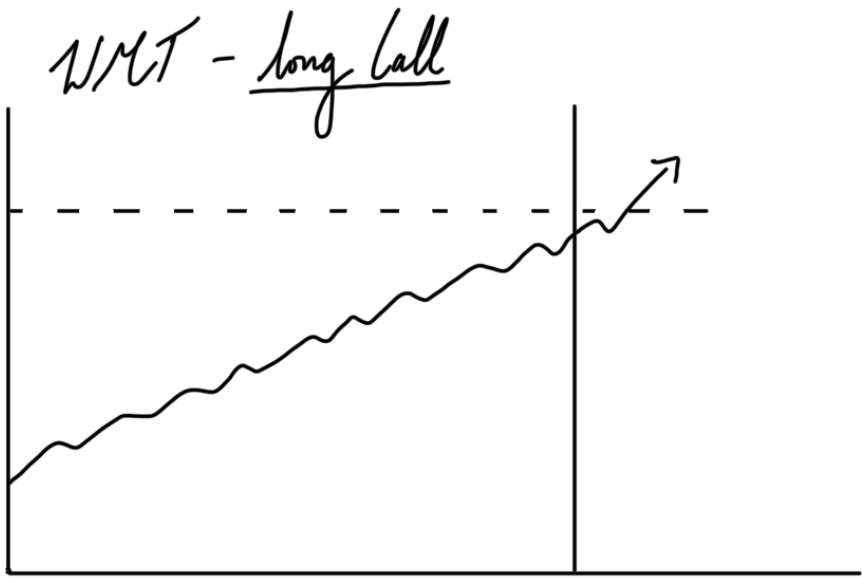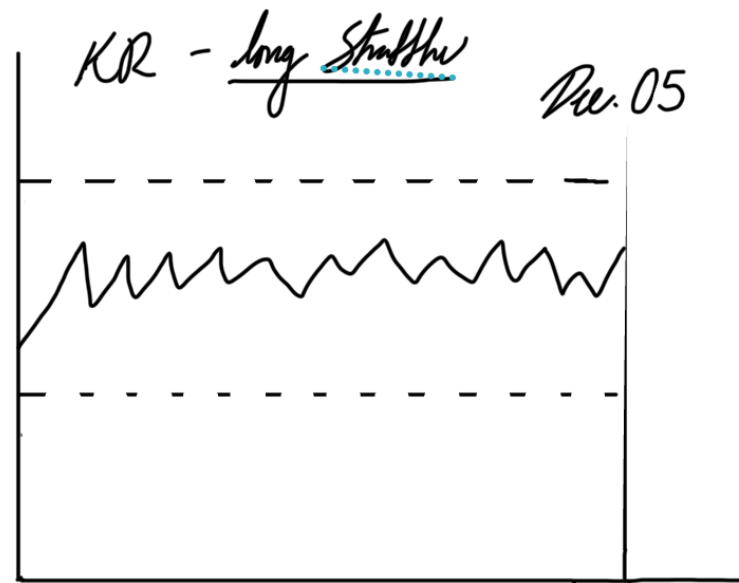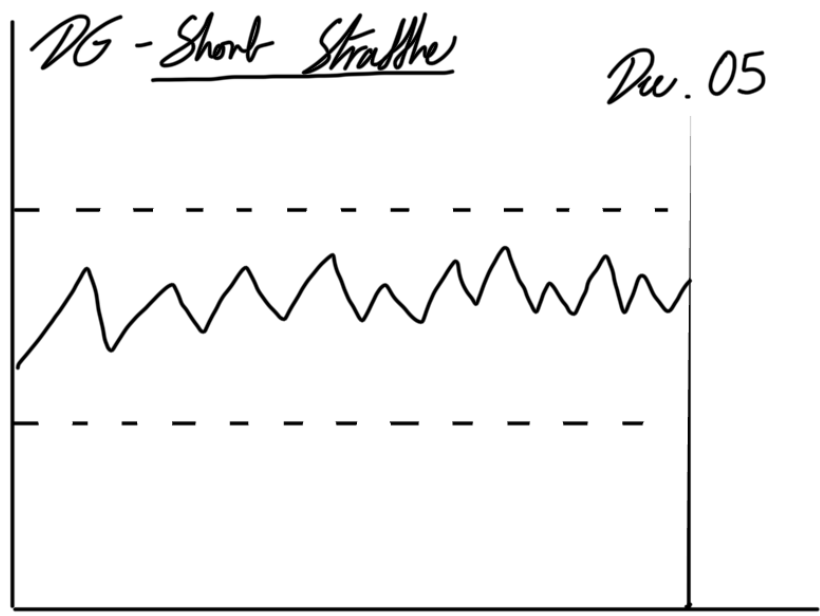
Investment Thesis

- Profit from decreased implied volatility post-earnings report for Dollar General (DG)
- Mitigate potential losses on DG by doing a long call on Walmart (WMT)

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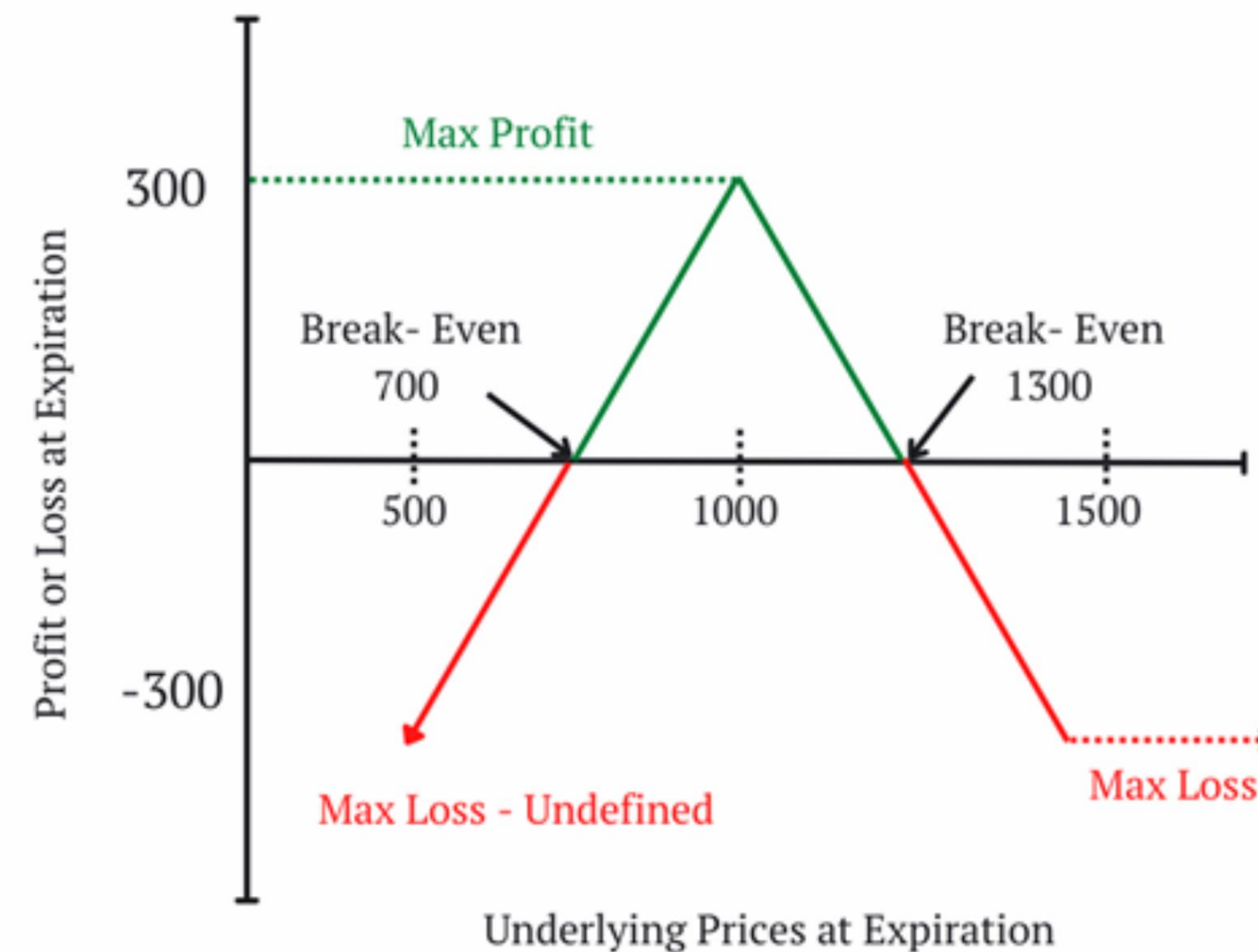
Strategy

- Pairs Trading Strategy (Earnings reports Dec. 5)

  o Short straddle on Dollar General (DG) – Naked

    - SELL equivalent number of calls and puts at a strike price like the trading price

    - BUY the straddle at a lower price (Sell high, buy low)

    - Profit, if stock does not have significant movement (Potential risks - unlimited)

- Long call on Walmart (WMT) - Risk mitigation

  o Profits from the continued, steady increase in the share price

  o Buy calls at a strike price slightly above the current trading price

  o Mitigates possible loss if DG goes beyond the limits of the straddle

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DG - Short Straddle   Dec. 05

KR - Long Straddle   Dec. 05

WMT - Long Call

Dollar General Corporation (DG) Stock Analysis

Dollar General (DG) Implied vs Realized Volatility (Since Jan 1, 2024)

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Model: Random Forest Regressor

- DG
  - Call Premium = 3.92
  - Put Premium = 5.12
    - Strike Price: $81.11
    - Upper Bound: $85.03
    - Lower Bound: $75.99
- WMT
  - Call premium = 0.42
- Mean Absolute Error
  - UB: 0.39
  - LB: 0.36

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The Greeks

- Vega- estimates how much an option premium may change with each 1% change in implied volatility
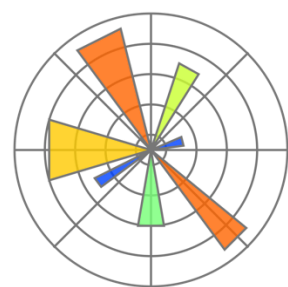 - Useful for: calculating risk within contracts

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Data Collection

Yahoo Finance

- Used to collect data on stock prices, volume and volatility

Matplotlib

- Used to chart and compare stock price movements and volatility

Earnings Hub

- Used to pick companies' and filter through their earnings

Google Colab

- Used to perform data analysis and code an algorithm using python

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Reflection

- Strategic Challenges

  o Original Approach: long straddle on Kroger to hedge our position with DG

  o Issues: Kroger had legal issues with their ongoing merger with Albertsons

  o Solution: Conservative long call with Walmart instead as a better approach

- What Worked Well

  o Effective communication early on

  o Task delegation according to skills

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Future Improvements

- Use more tools to pick stocks that have the behavior we are looking for in earnings season

- Find a method to automate stock screening more efficiently

- Effectively translate our strategy to code early on

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Q&A

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Thank You!

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