# Greeks Market Sentiment

**1. Introduction**

In intraday options trading, reading **real-time shifts in Delta, Vega, and Theta** can offer a powerful edge in determining **market sentiment**. Traditional Open Interest (OI) data arrives with a short delay and can be backward-looking, whereas **Greeks**—particularly Vega—react instantly to **changes in option premiums**. By aggregating the changes in Greeks across a defined set of strikes (e.g., Δ=0.5\Delta = 0.5Δ=0.5 to 0.10.10.1), traders can gain a **leading indicator** of institutional flows (buying vs. writing) for both **calls and puts**.

**2. Data Requirements**

1. **Timeframe**: 1-minute bars (or ticks, if available) for options.
2. **Fields Needed**:
   * **Option Price**: Open, High, Low, Close (OHLC) per minute (or per tick).
   * **Option Greeks**: Delta, Vega, Theta (and optionally Gamma) per strike/expiry.
   * **Open Interest (OI)**: 1-minute updates are typical (some platforms update every 3 minutes; use whatever is available).
   * **Underlying Price Data**: Nifty/BankNifty (or whichever underlying) to identify ATM strikes.
3. **Strike Range**:
   * **From ATM (~0.50 Delta) to 0.10 Delta** on both call and put sides.
   * Include **current week, next week, and current month** expiries to capture near-term flows.

**3. Selecting Relevant Strikes**

1. **Identify ATM Strike**:
   * ATM = the strike whose **Delta ≈0.50\approx 0.50≈0.50** (for calls) or −0.50-0.50−0.50 (for puts), or simply the strike closest to the underlying’s spot price.
2. **Move to OTM Strikes**:
   * For **calls**: go **above** the spot price until Delta ≈0.10\approx 0.10≈0.10.
   * For **puts**: go **below** the spot price until Delta ≈−0.10\approx -0.10≈−0.10.
3. **Organize by Expiry**:
   * **Current week** (weekly)
   * **Next week** (weekly)
   * **Current month** (monthly)
4. **Maintain a Strike List**:
   * E.g., 6–10 strikes on the call side and 6–10 on the put side, for each of the three expiries (adjust based on your preference/liquidity).

**4. Calculating (or Collecting) the Greeks**

1. **Delta**: Already given by the data provider or computed via Black-Scholes/Binomial model.
2. **Vega**: Reflects sensitivity of the **option premium** to changes in implied volatility.
3. **Theta**: Time decay per day (or per unit time—your platform may display annualized or per-day measures).
4. **Consistency Check**:
   * Verify the source or formula used by your broker/data platform (Black-Scholes inputs: Spot, Strike, Days to expiry, IV, Interest Rate, etc.).
   * If computing yourself, ensure consistent interest rates and annualization factors.

**5. Step-by-Step Implementation for Intraday Sentiment**

Below is the core workflow to build a **Greeks Market Sentiment** model in **real time** (every 1 minute).

**Step A: Initialize and Capture Baseline (Market Open)**

1. **At Market Open (say 9:15 AM)**:
   * For each selected strike (Calls & Puts from ~0.50 to ~0.10 Delta range), capture:
     + **Opening Vega (VopenV\_{open}Vopen​)**
     + **Opening Delta (Δopen\Delta\_{open}Δopen​)**
     + **Opening Theta (Θopen\Theta\_{open}Θopen​)**
   * Store these as your **baseline** (or reference) for that day.
2. **Handle Gap-Up/Gap-Down**:
   * The market might open significantly higher or lower; this **new open** already **discounts** overnight news/volatility.
   * These baseline values (VopenV\_{open}Vopen​, Δopen\Delta\_{open}Δopen​, Θopen\Theta\_{open}Θopen​) become the reference against which future changes are measured.

**Step B: Live Data Updates (Every 1 Minute)**

1. **At Each 1-Minute Bar** (e.g., 9:16 AM, 9:17 AM, …):
   * Retrieve **current Vega** (VcurrentV\_{current}Vcurrent​), **Delta** (Δcurrent\Delta\_{current}Δcurrent​), **Theta** (Θcurrent\Theta\_{current}Θcurrent​) for each strike.
   * Compute **Change** in each Greek relative to the **Baseline** or the **previous 1-min bar**. You can do either:
     + **vs. Baseline**: ΔV=Vcurrent−Vopen\Delta V = V\_{current} - V\_{open}ΔV=Vcurrent​−Vopen​
     + **vs. Previous Bar**: ΔV=Vcurrent−Vprevious\Delta V = V\_{current} - V\_{previous}ΔV=Vcurrent​−Vprevious​
   * Choose one method for consistency. Often, **comparing with the open** helps track overall intraday sentiment. Comparing with the **previous bar** helps detect micro-trends in momentum.
2. **Aggregate Across Strikes**:
   * **Sum** the Greek changes for **ATM to OTM** calls separately, and **ATM to OTM** puts separately.
     + Example: SumVegaCall=∑strikes(Vcurrent−Vopen)Call\text{SumVega}\_{\text{Call}} = \sum\_{\text{strikes}} (V\_{current} - V\_{open})\_{\text{Call}}SumVegaCall​=strikes∑​(Vcurrent​−Vopen​)Call​ SumVegaPut=∑strikes(Vcurrent−Vopen)Put\text{SumVega}\_{\text{Put}} = \sum\_{\text{strikes}} (V\_{current} - V\_{open})\_{\text{Put}}SumVegaPut​=strikes∑​(Vcurrent​−Vopen​)Put​
     + Similarly for **Delta** and **Theta**.
3. **Do This for Each Expiry**:
   * Current week, next week, and monthly.
   * Optionally, you can **combine** them or **keep them separate** to see where the biggest build-up occurs.

**Step C: Ranking or Sentiment Scoring**

1. **Define Thresholds**:
   * Typical approach: Identify numeric ranges that signify “high,” “medium,” or “low” changes in Vega.
   * For instance, if ∣SumVegaPut∣|\text{SumVega}\_{\text{Put}}|∣SumVegaPut​∣ exceeds **+10** or **-10** (absolute scale), that might indicate a strong sentiment shift. (Exact values will depend on your data’s scale and historical testing.)
2. **Interpretation** (Vega Focus):
   * **If SumVegaPut\text{SumVega}\_{\text{Put}}SumVegaPut​ is Large Negative**:
     + Means put Vega is **increasing** in real-time (you are subtracting bigger negative from baseline, which shows aggressive buying) → **Bearish Sentiment**.
   * **If SumVegaPut\text{SumVega}\_{\text{Put}}SumVegaPut​ is Large Positive**:
     + Means put Vega is **decaying** (aggressive put writing) → **Bullish Sentiment**.
   * **If SumVegaCall\text{SumVega}\_{\text{Call}}SumVegaCall​ is Large Negative**:
     + Means call Vega is **increasing** (aggressive call buying) → **Bullish Sentiment**.
   * **If SumVegaCall\text{SumVega}\_{\text{Call}}SumVegaCall​ is Large Positive**:
     + Means call Vega is **decaying** (aggressive call writing) → **Bearish Sentiment**.

**Note**: The sign interpretation can feel counterintuitive. Always confirm your sign convention. One easy check is: if call premiums are going **up** abnormally, the “change in Vega” aggregated from open to now should be in a direction that indicates **call buying** (often a negative aggregated value if your baseline reference is set a certain way). You may need to adjust the sign logic to match your data feed.

1. **Delta & Theta Confirmation**:
   * **Delta**: Tells you whether the probability of these calls/puts expiring ITM is going up or down.
     + E.g., ∑(Δcurrent−Δopen)Call\sum (\Delta\_{current} - \Delta\_{open})\_{\text{Call}}∑(Δcurrent​−Δopen​)Call​ large negative → calls’ deltas are **increasing** in actual probability terms → bullish.
   * **Theta**: Typically always decays with time, but if there is a huge **negative** shift in Theta (i.e., an increase in that day’s “time decay” reading), it may signal a strong directional move just occurred (since theoretical models can show “negative decay” intrabar for large re-pricings).
2. **Combine or Rank**:
   * You can produce a final “Market Sentiment Score” by weighting vega, delta, and possibly theta: SentimentScore=wV×(SumVegaCall+SumVegaPut)+wΔ×(SumDeltaCall+SumDeltaPut)\text{SentimentScore} = w\_V \times (\text{SumVega}\_{\text{Call}} + \text{SumVega}\_{\text{Put}}) + w\_\Delta \times (\text{SumDelta}\_{\text{Call}} + \text{SumDelta}\_{\text{Put}})SentimentScore=wV​×(SumVegaCall​+SumVegaPut​)+wΔ​×(SumDeltaCall​+SumDeltaPut​)
   * Adjust **weights** (wV,wΔw\_V, w\_\DeltawV​,wΔ​) based on which factor you trust more from backtesting.
   * Alternatively, keep them separate and label each as “Bullish,” “Bearish,” or “Neutral,” then combine them with simple rules (e.g., majority, or big differences in magnitudes).

**6. Practical Example of Intraday Sentiment**

Imagine at **10:00 AM**:

* **SumVega\_Put (relative to 9:15 AM)** = **+15**
  + Interpretation: Put Vega is decaying →\rightarrow→ put options are being **sold** →\rightarrow→ typically a **bullish** sign.
* **SumVega\_Call** = **-6**
  + Interpretation: Call Vega is increasing (modestly) →\rightarrow→ some call buying →\rightarrow→ also hints **bullish** or partial hedge.
* **Net Sentiment** = predominantly **Bullish** (because of the large **+15** in put vega decays).

You might respond by:

* **Writing (selling) puts** more aggressively if you see the put side continue to decay.
* Or building **bullish calendar** spreads if implied volatility is still rising in calls, etc.

**7. Additional Considerations & Tips**

1. **Live vs. Aggregated Data**
   * You can **refresh** your calculations every minute or every few seconds (if you have tick data). The more frequent, the more “noise”—so test your refresh interval.
2. **Volatility Regime (India VIX)**
   * Overlay your results with the broad market volatility index (e.g., India VIX).
   * If **VIX is above a pivot** or uptrending, option premiums may expand quickly → favor buying or hedged spreads.
   * If **VIX is declining**, premiums compress → favor option writing.
3. **Strike Liquidity**
   * The deeper OTM you go, the less volume/liquidity.
   * Focus on “active” strikes with tight bid-ask to avoid misleading Greek calculations.
4. **Gamma Consideration**
   * If the market makes a **large** directional move, “Gamma” will shift Delta quickly. This can also manifest in big, sudden changes in Vega.
   * Keep an eye on volatility spikes or big price bars to see if your aggregated Greeks jump.

**8. Risk Management & Execution**

1. **Position Sizing**
   * Always define your **maximum risk**. Option greeks analysis helps with direction but does not guarantee immediate profitability.
2. **Stop-Loss vs. Hedge**
   * Instead of a strict stop-loss, consider **rolling** or **hedging** if your Greek-based sentiment flips. For instance:
     + If you sold puts (bullish) and see a sudden reversal in the **Vega for puts** (turning from +15 to -10), the data indicates put buying → hedge or exit.
3. **Algos & Automation**
   * Many traders automate this Greek-sentiment scanning. You can feed the final signals into an API-based execution or a semi-automatic system.

**9. Conclusion**

By **tracking Vega, Delta, and Theta changes** across **ATM to OTM** strikes in real-time, you can build a **dynamic sentiment gauge**. This approach provides **immediate visibility** into who’s dominating the market flow (buyers vs. writers) **well before** the open interest or slower data sets confirm it. The key steps are:

1. **Collect** high-quality 1-min Greeks data.
2. **Define** your strike/expiry universe.
3. **Calculate** minute-to-minute changes in Vega, Delta, Theta.
4. **Aggregate** those changes for calls vs. puts.
5. **Establish** threshold or scoring logic to interpret Bullish, Bearish, or Neutral.
6. **React** by deploying strategies (option buying, writing, spreads) consistent with that sentiment.

Armed with these **step-by-step guidelines**, you can experiment, backtest, and refine a robust **Greeks Market Sentiment** model for intraday trading in Nifty, BankNifty, or any other highly liquid derivative.

**Final Note**

* Always **validate** sign conventions (whether negative or positive changes indicate increased or decreased Vega) based on your calculation method.
* **Practice in paper trading** or small size first; the most powerful Greek-based signals often require thorough testing and **position management rules**.
* A well-structured Greeks sentiment model—especially focusing on **Vega**—can become a **leading indicator** of intraday market direction.