When the Options Market Disagrees
Fournier, Goyenko, and Grass

Discussion by Travis L. Johnson

The University of Texas at Austin
Paper constructs two disagreement measures using data on option orders by customers (not firms/prop trading desks):

- **DIS**: is volume concentrated in buys/sells or evenly mixed?
  - Min when 100% buys or 100% sells, max when 50/50
  - Computed for calls and puts separately, then averaged

- **DIS-CP**: is volume concentrated in +/− bets or mixed?
  - + bet = buy call or sell put, − bet = buy put or sell call
  - Min when 100% positive or 100% negative, max when 50/50

Weekly $DIS_t$ and $DIS-CP_t$ negatively predict weekly $r_{t+1}$

1. Regardless of whether there is good, bad, or no news in week $t$
2. 4× stronger among top 10% of stocks by loan fees
3. Up to 5 weeks into future
Disagreement and future returns

Authors interpret their results as indicating:

- *DIS* and *DIS-CP* are good measures of **disagreement**
- High disagreement $\Rightarrow$ stock overpriced $\Rightarrow$ low future returns

Prior evidence on disagreement and future returns:

- **Measures**: analyst forecast dispersion, volume, breadth of institutional ownership, dispersion in institutional holdings
- **Results**: some positively predict returns, some negatively predict returns

Advantages of an options-based measure:

- Actual trades, available daily/weekly
- Natural venue for speculation by leverage-constrained investors, can cleanly measure active side of trade
Authors ask an important question that is unresolved empirically: does disagreement correlate with high or low future returns? Why?
- Have theories for both directions

Given prior empirical results, they contribute to the extent their disagreement measure cleaner than alternatives

My goal today: help understand if they succeed
- Spoiler: they do, but further tests would improve their case
Disagreement and asset pricing

Disagreement and **short-sale constraint** (Harrison and Kreps (1978))

- Optimists over-value stock, over-weight it in their portfolio (levering up if necessary)
- Pessimists under-value stock, under-weight it in their portfolio (but cannot short)
- Deep-pocketed arbitrageurs fully match any imbalance created by excess demand by pessimists, but cannot do the same for optimists because not allowed to short

⇒ overpricing whenever sufficient disagreement, future returns **negatively** related to disagreement
Disagreement and risk aversion (Banerjee (2011))

- Optimists over-value stock, over-weight it in their portfolio (levering up if necessary)
- Pessimists under-value stock, under-weight it in their portfolio (short-sell if necessary, borrowing shares from optimists)

Risk aversion channel:

- Agree to disagree: if investors don't condition on prices, private information reduces subjective risk ⇒ higher prices
- Rational expectations equilibrium: if investors condition on prices, concern about other investor's information increases subjective risk ⇒ lower prices

⇒ future returns positively or negatively related to disagreement depending on whether investors condition on prices
Disagreement and **share lending constraint** (e.g. Duffie (1996))

- Optimists over-value stock, over-weight it in their portfolio (levering up if necessary) but do not lend their shares
  - Hold all shares outstanding at inflated price, don't sell or lend
- Pessimists under-value stock, hold short positions, pay non-trivial lending fee to borrow shares from arbitrageur
- Deep-pocketed arbitrageurs buy shares and lend them to the pessimists to capture non-trivial lending fee

Think of lending fees like dividends: you receive them when you long, pay them when you short, prices decline in proportion

⇒ overpricing whenever sufficient disagreement, lending fee proportional to mispricing so there’s no after-fee arbitrage
⇒ future returns **negatively** related to disagreement, but fee-inclusive future returns **unrelated**
Distinguishing between theories

Direction of relation with future returns helps

- **Positive**: consistent with rational expectations equilibrium or increased subjective risk
- **Negative**: consistent with reduced subjective risk, short-sale constraint, or share lending constraint

Further distinguish among “negative” stories using lending fees

- **✓ Reduced subjective risk**: should work, perhaps more weakly, when lending fee = 0
- **✓ Short-sale constraint**: disagreement negatively related to future returns when short-selling ‘constrained,’ (top 10% of lending fee/utilization) not otherwise
- **? Share lending constraint**: future returns = $-1 \times$ lending fee, no incremental role for disagreement
Distinguishing between theories

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Empirical evidence on distinguishing between theories

New tests the authors could use to help distinguish between disagreement theories:

- Add lending fee as linear control
  - *Share lending constraint* story implies this will drive out disagreement proxy
  - If result goes away, it’s OK! Just means disagreement simultaneously causes lending fees and poor future returns

- Use 2008 short-sale ban as a direct test (small-sample, admittedly) test of the *short-sale constraint* story

- Some more-direct test of the *reduced subjective risk* story?
Do $DIS$ and $DIS-CP$ measure disagreement?

**Definition**

- **$DIS$**: is volume concentrated in buys/sells or evenly mixed?
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- **$DIS-CP$**: is volume concentrated in $+$/$-$ bets or mixed?
  - $+$ bet = buy call or sell put, $-$ bet = buy put or sell call
  - Min when 100% positive or 100% negative, max when 50/50

**My interpretation**

- Measures of disagreement among options ‘customers’

- But they may be *inversely* related to disagreement between options and stock traders, and disagreement between option customers and firms

  - When option volume is 100% buys, or 100% $+$ bets, this means all options traders seem to agree with each other but disagree with whoever sets current price
Do \textit{DIS} and \textit{DIS-CP} measure disagreement?

Theories pertain to disagreement among stock investors

- Need this to be correlated with disagreement among options customers but \textit{not} disagreement between options customers and options firms/stock investors

- Control for |put-call parity deviation| as measure of stock-option disagreement?

Mechanical link from \textit{DIS} and \textit{DIS-CP} to option volume

- Low volume means more likely to (by chance) have high concentration in buys/+ bets \Rightarrow lower \textit{DIS} and \textit{DIS-CP}

- High volume means law of large numbers makes \% of buys/+ bets converge towards 50\% \Rightarrow higher \textit{DIS} and \textit{DIS-CP}

\textit{DIS} and \textit{DIS-CP} \sim 60\% correlated with log(Option Volume)

- Linear control in regressions, but mechanical link isn’t linear

- Problematic given evidence in Johnson and So (2012) that Option Volume/Stock Volume negatively predicts returns
Using options data to measure disagreement is a good idea

- Authors execute it well
- Current evidence indicates disagreement leads to overpricing
- Further evidence could help disentangle possible stories
- Separate measures for disagreement among options traders and disagreement between options and stock traders?