

Discussion of “Option Returns: A Tale of Two Expiration Rollover Days” by Garcia-Ares and Muravyev

Vincent Bogousslavsky

Boston College

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Summary

- Daily-delta-hedged call option returns are
 - 0.19% from end of month to expiration-1
 - -0.43% from expiration-1 to expiration+2
 - 0.04% over rest of month
- Application: 18 option return anomalies can be mostly attributed to rollover days
- Explanation: demand pressure and intermediary frictions
 - As opposed to “generic market inefficiency or behavioral biases”

Methodology

- Enter into option (> 1 month to expiration) at end of month, close at end of following month
- Compute monthly profit

$$\Pi_{t+\tau} = C_{t+\tau} - C_t - \sum_{n=0}^{N-1} \Delta_{C,t_n} [S(t_{n+1}) - S(t_n)] - \sum_{n=0}^{N-1} \frac{a_n r_{t_n}}{365} [C(t_n) - \Delta_{C,t_n} S(t_n)]$$

- Return = profit scaled by the absolute value of the initial investment ($|\Delta_t S_t - C_t|$)
- Decompose monthly return into expiration/rollover days and other days
 - Not equivalent to separately computing rollover return and non-rollover return

$$\frac{P_c}{P_{c-1}} - 1 = \frac{P_o}{P_{c-1}} \times \frac{P_c}{P_o} - 1 = \frac{P_o - P_{c-1}}{P_{c-1}} + \frac{P_c - P_o}{P_{c-1}}$$

Methodology: adjust the delta hedge daily

- Daily delta hedging matters: for 8/13 overlap anomalies, average delta-hedged return is statistically insignificant in Duarte et al (2025)
- Hence, 1) “resurrect” anomalies, 2) explain them
- For completeness, the paper should report everything with one-time delta hedging (Table A1 is not for anomalies)
- Magnitudes seem larger with one-time delta hedging (Table A1), however
 - “Daily delta hedging does not affect average returns, but greatly decreases their volatility” (p.6)
- This could affect the interpretation: why do intermediary frictions imply *stronger/weaker* daily-delta hedged anomaly return?

Anomaly returns

Daily Delta-Hedged Monthly Call Option Returns						
	Full Month Ex-rollover			Rollover		
	D1	D10	D10-D1	D1	D10	D10-D1
AVERAGE ANOMALIES	0.46 (4.87)	0.18 (1.33)	-0.28 (-3.90)	-0.29 (-13.20)	-0.66 (-16.51)	-0.36 (-13.69)
CFV	0.50 (4.78)	0.24 (1.76)	-0.25 (-2.34)	-0.27 (-11.79)	-0.56 (-14.68)	-0.29 (-9.37)
CH	0.54 (4.96)	0.09 (0.63)	-0.46 (-4.20)	-0.28 (-9.93)	-0.70 (-17.95)	-0.42 (-13.27)
DISP	0.41 (4.47)	0.46 (3.67)	0.04 (0.70)	-0.25 (-10.78)	-0.54 (-14.56)	-0.28 (-11.01)
ISSUE ₁ Y	0.41 (4.19)	0.29 (2.21)	-0.12 (-1.63)	-0.28 (-11.19)	-0.60 (-15.36)	-0.33 (-10.12)
ISSUE ₅ Y	0.45 (4.57)	0.16 (1.22)	-0.29 (-4.10)	-0.26 (-11.48)	-0.55 (-13.48)	-0.30 (-8.57)
-PM	0.51 (4.70)	0.11 (0.74)	-0.40 (-4.46)	-0.38 (-12.87)	-0.74 (-17.96)	-0.35 (-9.68)
-Ln(PRICE)	0.36 (3.51)	0.21 (1.24)	-0.15 (-1.07)	-0.22 (-9.74)	-0.78 (-14.82)	-0.56 (-11.35)
-PROFIT	0.37 (3.54)	0.35 (2.86)	-0.02 (-0.27)	-0.34 (-12.42)	-0.57 (-14.99)	-0.24 (-9.40)
TEF	0.43 (4.88)	0.27 (1.90)	-0.16 (-1.68)	-0.30 (-12.34)	-0.69 (-14.72)	-0.39 (-9.51)
-ZS	0.31 (2.32)	0.21 (1.37)	-0.10 (-0.76)	-0.56 (-13.34)	-0.64 (-13.92)	-0.08 (-1.76)
-VOL DEVIATION	0.95 (6.96)	-0.55 (-3.63)	-1.51 (-8.92)	-0.38 (-12.45)	-0.64 (-14.32)	-0.25 (-7.20)
IVOL	0.35 (4.48)	0.15 (0.96)	-0.21 (-1.92)	-0.19 (-9.04)	-0.75 (-16.75)	-0.57 (-15.35)
Ln(AMIHU)	0.33 (3.31)	0.55 (3.23)	0.22 (1.40)	-0.26 (-10.84)	-0.57 (-11.18)	-0.31 (-6.49)
Ln(ME)	0.33 (3.48)	0.37 (2.18)	0.04 (0.24)	-0.24 (-10.24)	-0.64 (-11.71)	-0.40 (-7.83)
MF SKEW	0.62 (6.35)	0.54 (3.87)	-0.09 (-1.13)	-0.24 (-9.45)	-0.48 (-10.65)	-0.24 (-6.54)
CALL IV ATM	0.50 (5.79)	-0.47 (-2.66)	-0.98 (-6.37)	-0.14 (-7.54)	-1.01 (-18.08)	-0.87 (-17.13)
-IV TERM	0.52 (4.58)	0.05 (0.33)	-0.47 (-4.46)	-0.49 (-14.92)	-0.72 (-13.71)	-0.22 (-5.93)
MAX(1)	0.35 (3.86)	0.25 (1.69)	-0.11 (-1.10)	-0.21 (-9.50)	-0.66 (-16.74)	-0.44 (-14.33)

Negative returns for *all* portfolios on rollover days

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Positive returns for *all but two* portfolios on ex-rollover days

Anomaly returns: interpretation

- The long-short spread becomes more extreme (per day) around rollover days
- This is unlike many “seasonality patterns” in stock returns where the spread *switches* sign
 - January vs other months (Keloharju, Linnainmaa, and Nyberg, 2016; Bogouslavsky, 2015)
 - Day of the week (Birru, 2018)
 - Day and night (Lou, Polk, and Skouras, 2019)
 - Intraday intervals (Bogouslavsky, 2021)
- An “amplified” spread seems consistent with intermediary frictions (perhaps less so with behavioral explanations based on mood or other clientele effects)

Do we see anything for stock return anomalies?

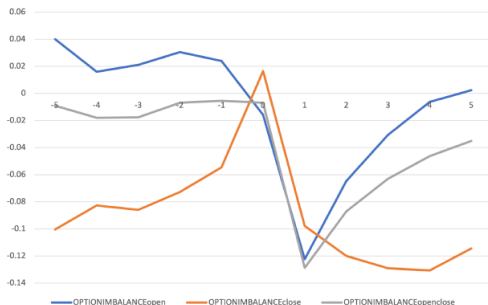
	average anomaly daily return (bps)		
	Baseline	DoW	DoW + 3rd Friday/Monday
constant	1.73** (0.84)		
Monday		6.82*** (2.17)	6.97*** (2.39)
Tuesday		2.23 (1.92)	2.23 (1.92)
Wednesday		0.79 (1.88)	0.79 (1.88)
Thursday		0.77 (1.82)	0.77 (1.82)
Friday		-1.63 (1.58)	-3.23* (1.84)
3rd_friday			6.84* (3.53)
opex_monday			-0.66 (5.56)

Sample: 1996-2024; 'Cash_ret', 'ShareIss1Y_ret', 'ShareIss5Y_ret', 'VarCF_ret', 'ForecastDispersion_ret', 'Price_ret', 'OperProf_ret', 'IdioVol3F_ret', 'Illiquidity_ret', 'RealizedVol_ret', 'MaxRet_ret' from open source asset pricing library (Chen and Zimmermann, 2022)

⇒ suggestive of an option-specific explanation

Smoking gun: order imbalance

Figure 3. *Option Order Imbalances around the standard monthly expiration day*



- Imbalance persistently negative, but no effect on r_{t+2}
 - Price impact of anticipated imbalance should be lower
 - Nonlinear return-imbalance relation (Table 3)
- In standard inventory model, reversal compensates liquidity providers, but there is no reversal here
 - More discussion from the perspective of the market maker would help

Additional suggestions

- How related are the option anomalies? Show the correlation matrix on all days, rollover days, and other days
- For a trader, would it make sense to roll the position earlier to incur less price impact?
 - Is the traders' behavior “rational” given the pattern?

In summary

- Nice paper with a striking finding!
- The intermediary friction explanation is intuitive
- It would help to dig deeper into the order imbalance evidence and the prediction of inventory models
- Good luck!