

Reversals and the returns to liquidity provision

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Short-run reversals

- Recent losers outperform recent winners
 - On average
- Well documented
 - Fama (1965), Roll (1984), Jegadeesh (1990), Lehmann (1990)
- Fairly weak outside microcaps
 - Modest spreads, marginal significance
 - Gotten weaker

Why are there reversals?

“The returns of short-term reversal strategies in equity markets can be interpreted as a proxy for the returns from liquidity provision”

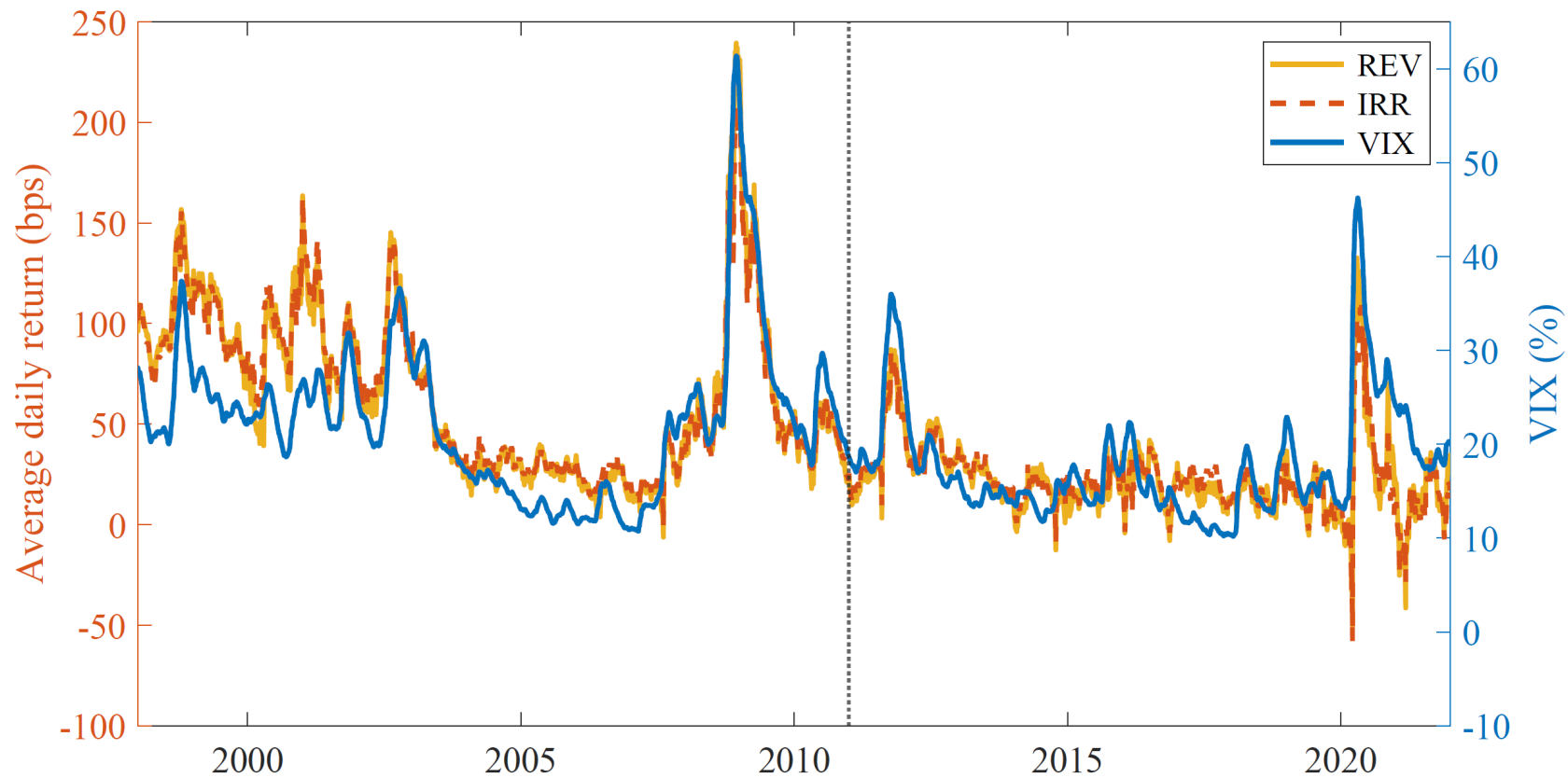
□ Nagel, JF 2012

Basic intuition

- To accommodate sellers' demands...
 - ...Liquidity providers must buy
 - While selling pushes prices down
- Liquidity providers expect compensation
 - Unwind (sell) later for more (on average)
 - As liquidity replenished and prices recover
 - I.e., as “losers” rise

Evidence (Nagel 2012)

- Trading more costly in volatile markets
 - So high vol → more profitable reversals

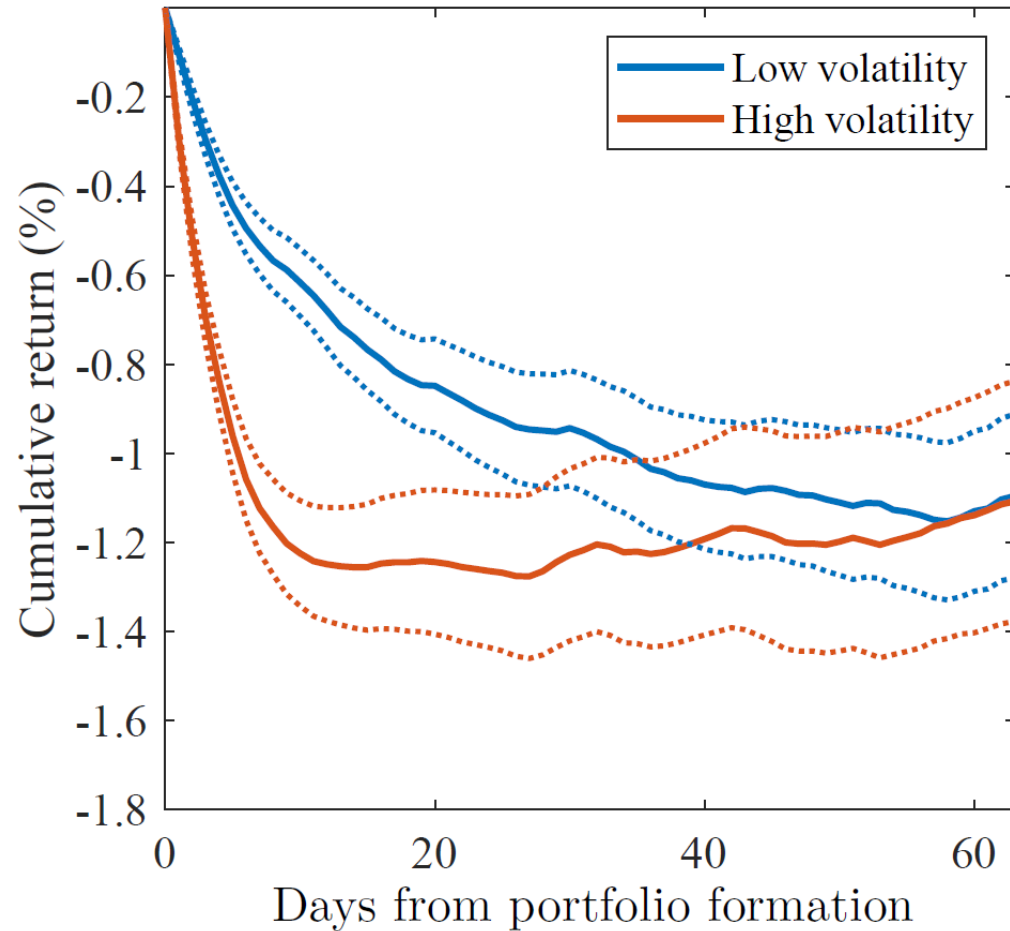


This paper

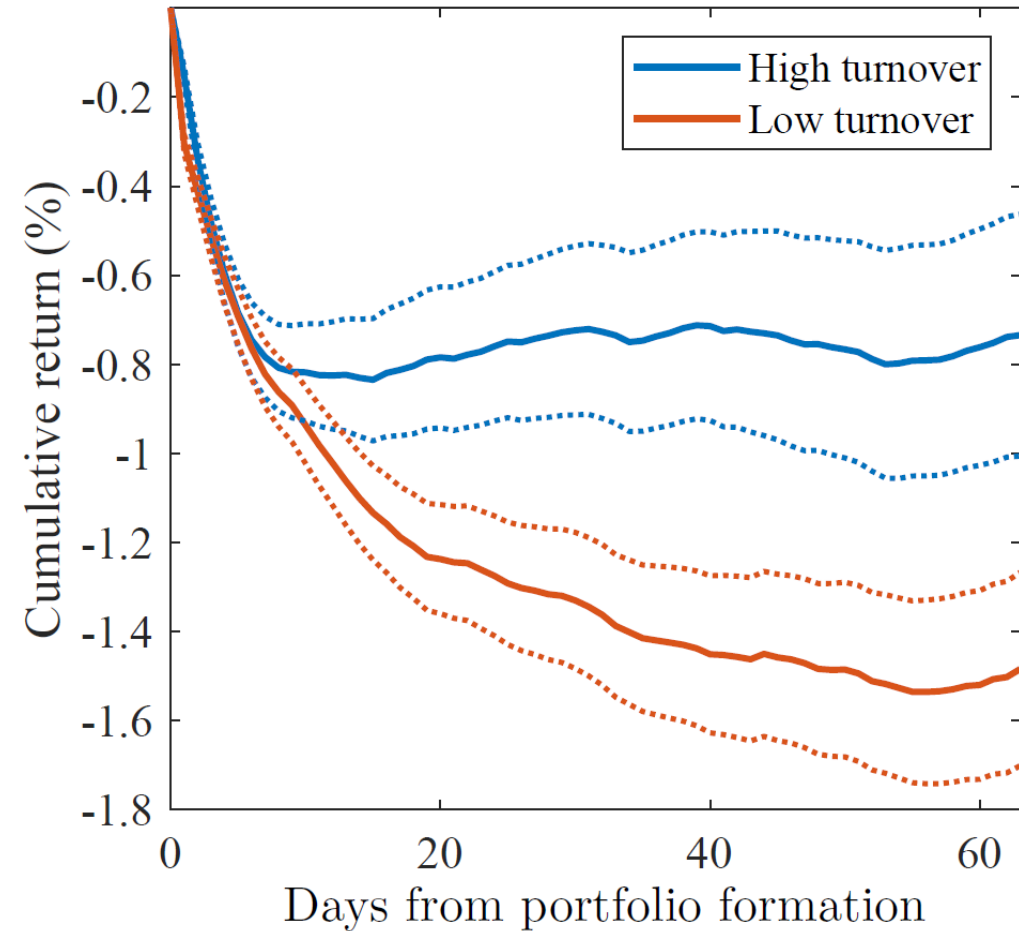
- **Cross-sectional** implications
- If reversals proxy for the returns to liquidity provision...
 - ...Then illiquidity differences should matter!
 - Across stocks
 - How should we even measure illiquidity?
- Should obviously look at magnitudes
 - Also **persistence!**

WML spread from formation

Reversals by volatility



Reversals by turnover



Illiquidity

- Size (small stocks are less liquid)
- Volatility
 - Strongly correlated with t-costs
 - In both the cross-section and the time-series
 - Drives market maker **inventory risk**
- Turnover
 - Less liquidity should imply less trading
 - And longer **inventory durations**

Reversals facts

- Bigger for micro-caps
 - Known...but **surprisingly concentrated**
- **Strong** among high-vol. stocks
 - Which expose MMs to more inventory risk
- **Persistent** for low-TO stocks
 - Where inventory durations are longer
 - Huge variation in persistence!
 - “Business time” or “trade time”

Reversal refinement

- Reversals as a lens to study liquidity
- Theory: Price moves **unrelated** to news → reversals
- Common reversals trade against news
 - Earnings announcements
 - Post-earning announcement drift (PEAD)
 - News about industries
 - Short-term industry momentum (IMOM)

Reversal decomposition

Panel A: Strategy average monthly excess return (%)

REV	PEAD	IMOM	IRR	IRRX
0.31 [1.68]	0.53 [5.45]	0.68 [3.57]	0.74 [5.40]	1.08 [9.35]

Panel B: Results from $REV_t = \alpha + \beta_{IRRX} IRRX_t + \beta_{PEAD} PEAD_t + \beta_{IMOM} IMOM_t + \epsilon_t$

α	β_{IRRX}	β_{PEAD}	β_{IMOM}	Adj. R^2 (%)
0.13 [1.73]	0.76 [27.8]	-0.54 [-17.4]	-0.53 [-30.4]	87.0

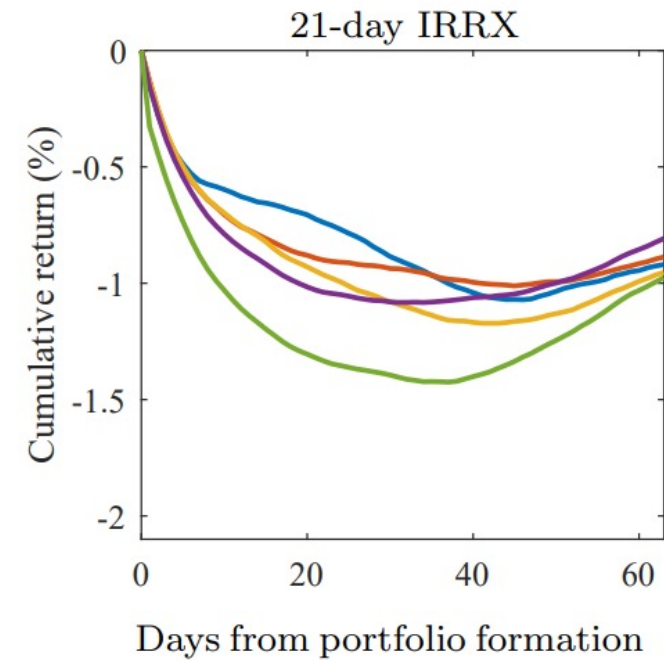
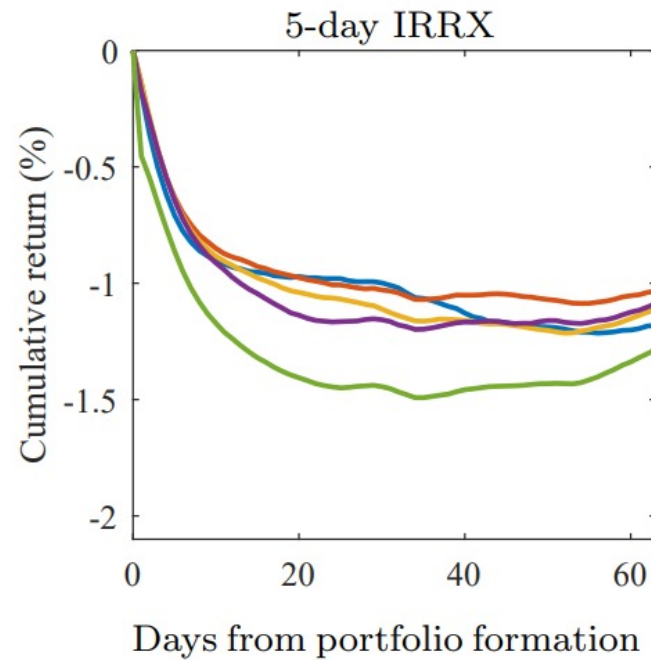
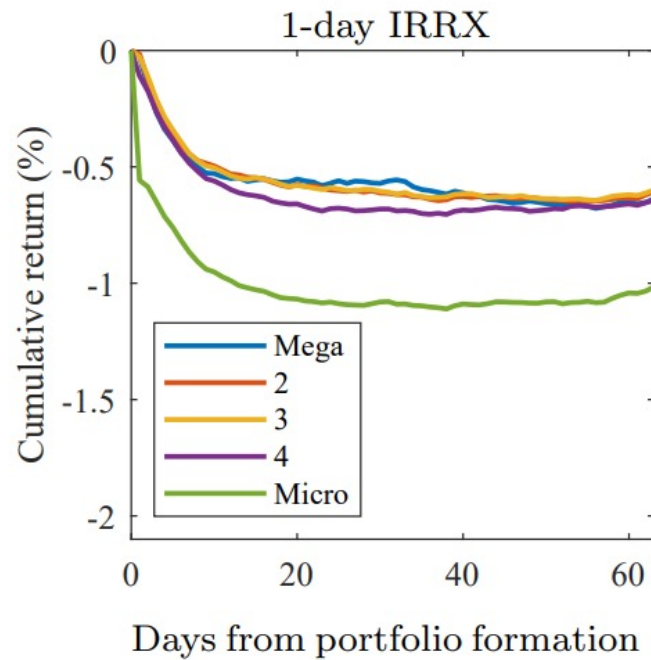
- We mostly use IRRX
 - Results robust to using REV

Illiquidity and reversals

- How do reversals vary with different aspects of illiquidity?
 - Evolution over time
 - From portfolio formation
- Use size, volatility, and turnover
 - Look at 1-, 5-, and 21-day past performance
 - Will focus mostly on 5-day
 - 1-day has clean interpretation, but noisy results
 - 21-day is least noisy, but interpretation is harder

Reversals by size

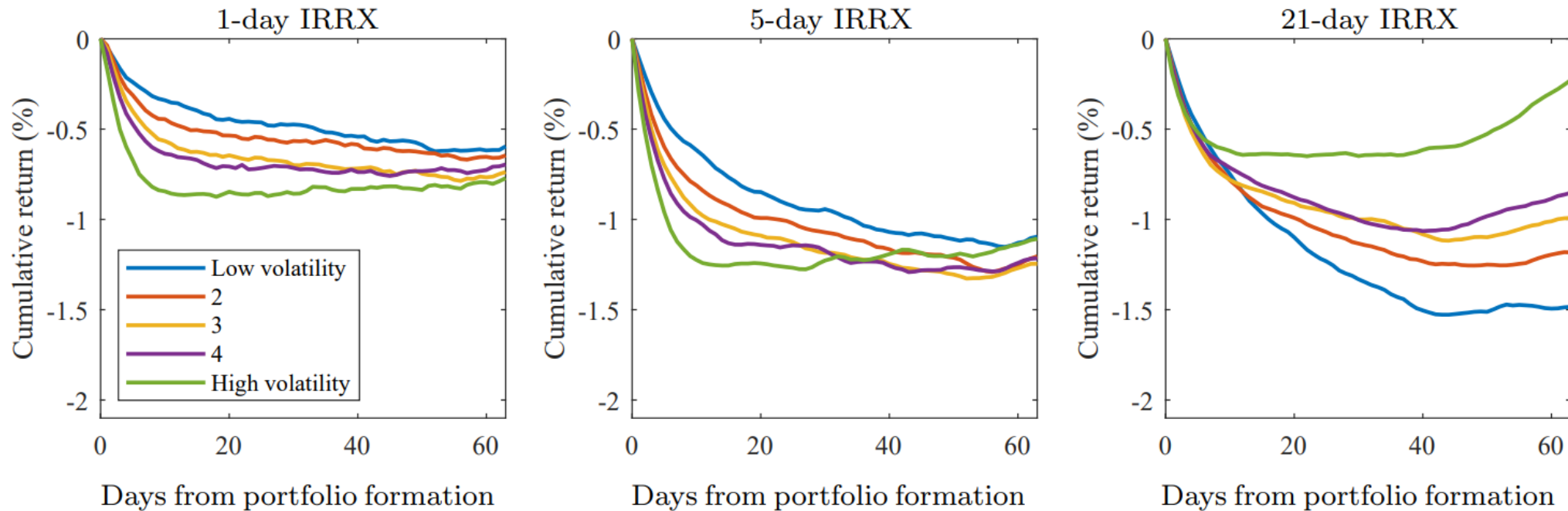
- Average WML spread from formation



- Stronger for microcaps (~3% of the market)
 - More limited market-making

Reversals by volatility

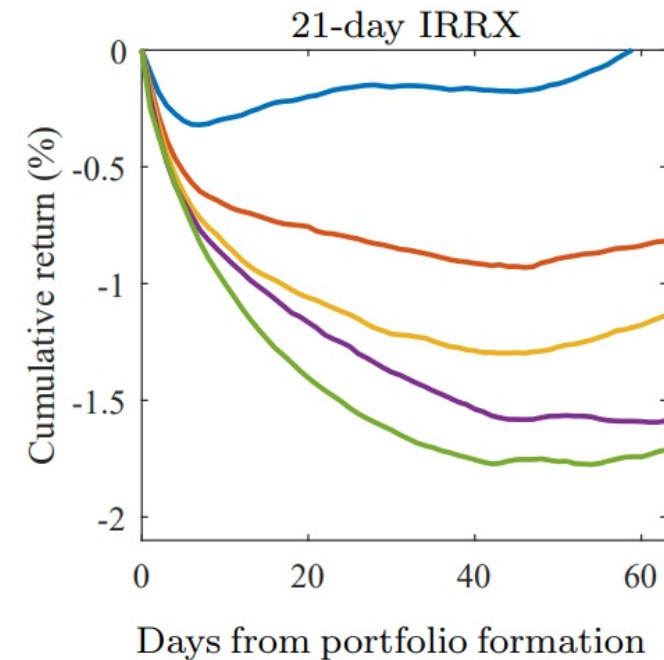
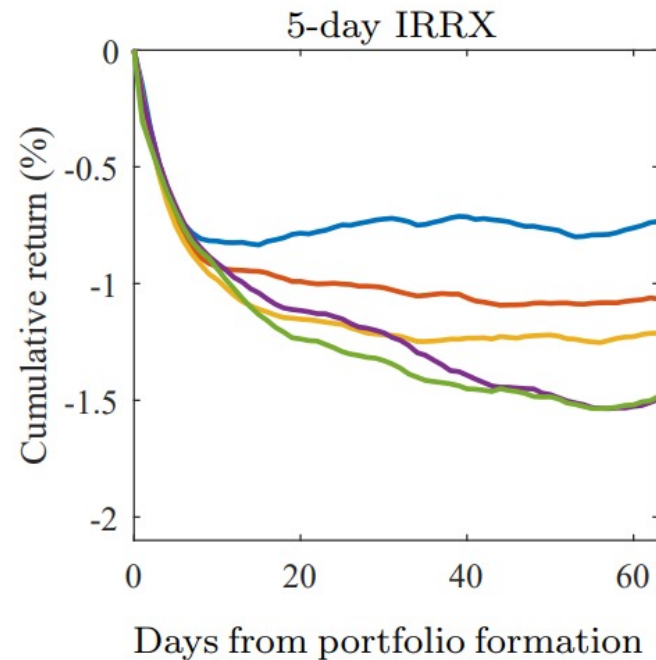
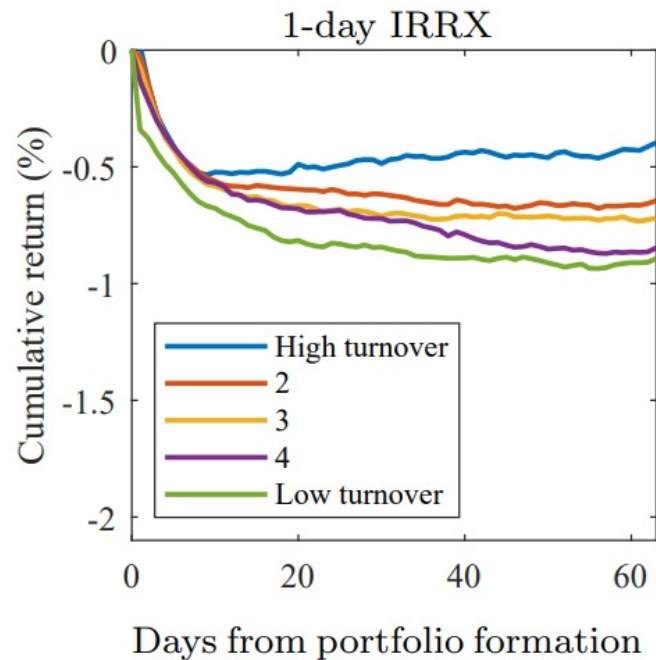
■ Average WML spread from formation



- High vol associated w/ stronger, initially faster revs
 - More vol → greater inventory risk

Reversals by turnover

- Average WML spread from formation



- Low TO → longer-lived, more persistent reversals
 - Less turnover → longer inventory durations

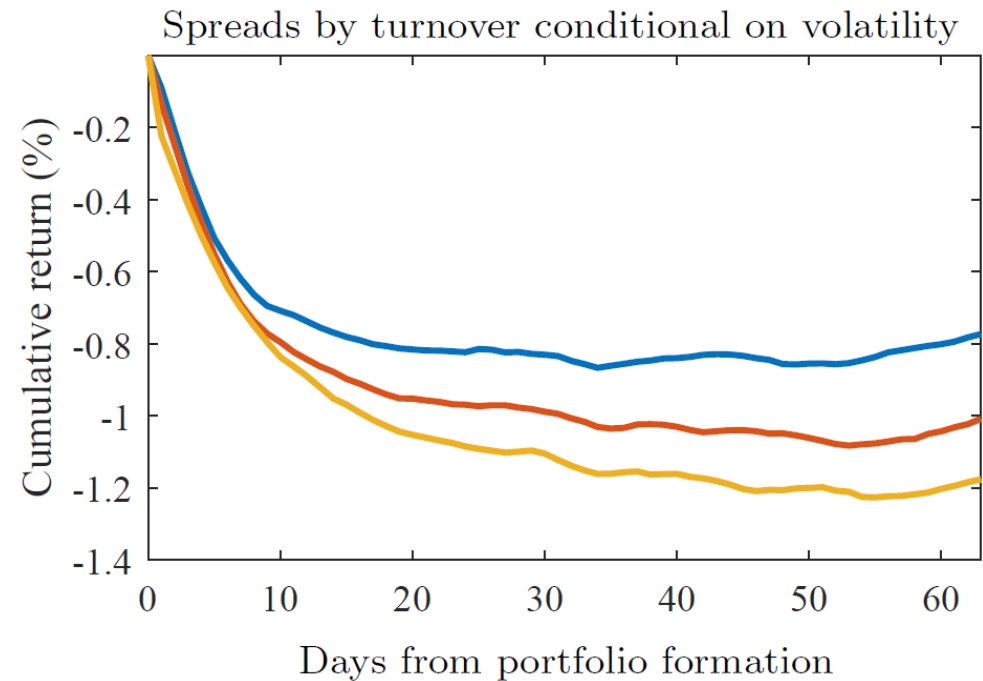
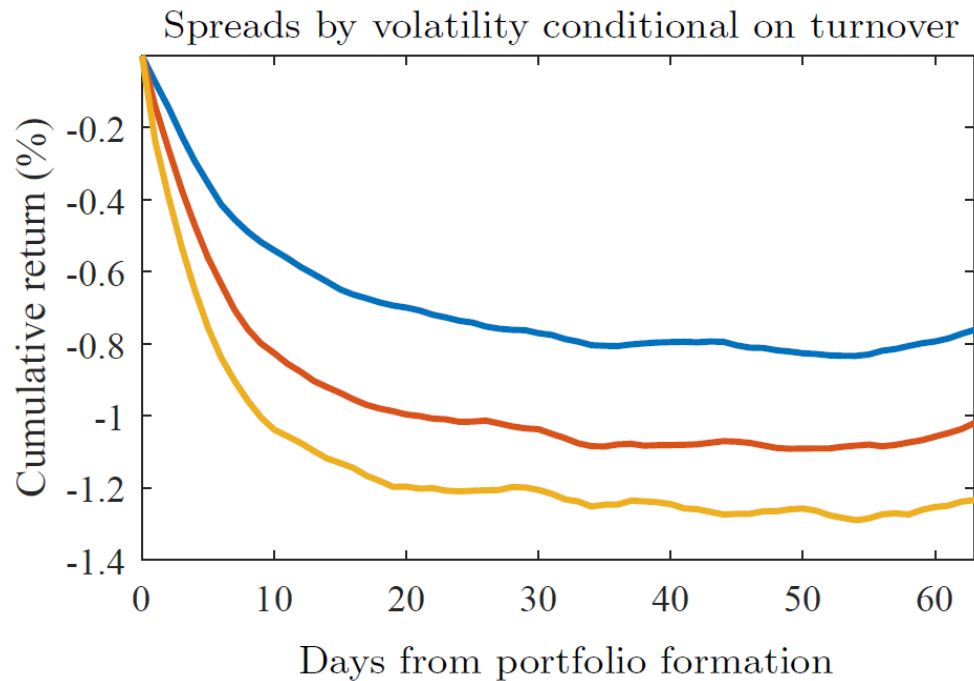
Holding all else equal

- When studying impact of illiquidity...
 - ...Should control for other measures
 - Our measures are correlated
 - Volatility and turnover are positively correlated
 - Small stocks tend to be more volatile and trade less
- Use propensity-matched sorting procedure of Novy-Marx (2015)
 - Within three FF (2016) size universes

Results with controls

- Consistent (even cleaner) results
 - Though less variation in past performance

Panel B: Small cap conditional winner-minus-loser spreads by volatility (left) and turnover (right)



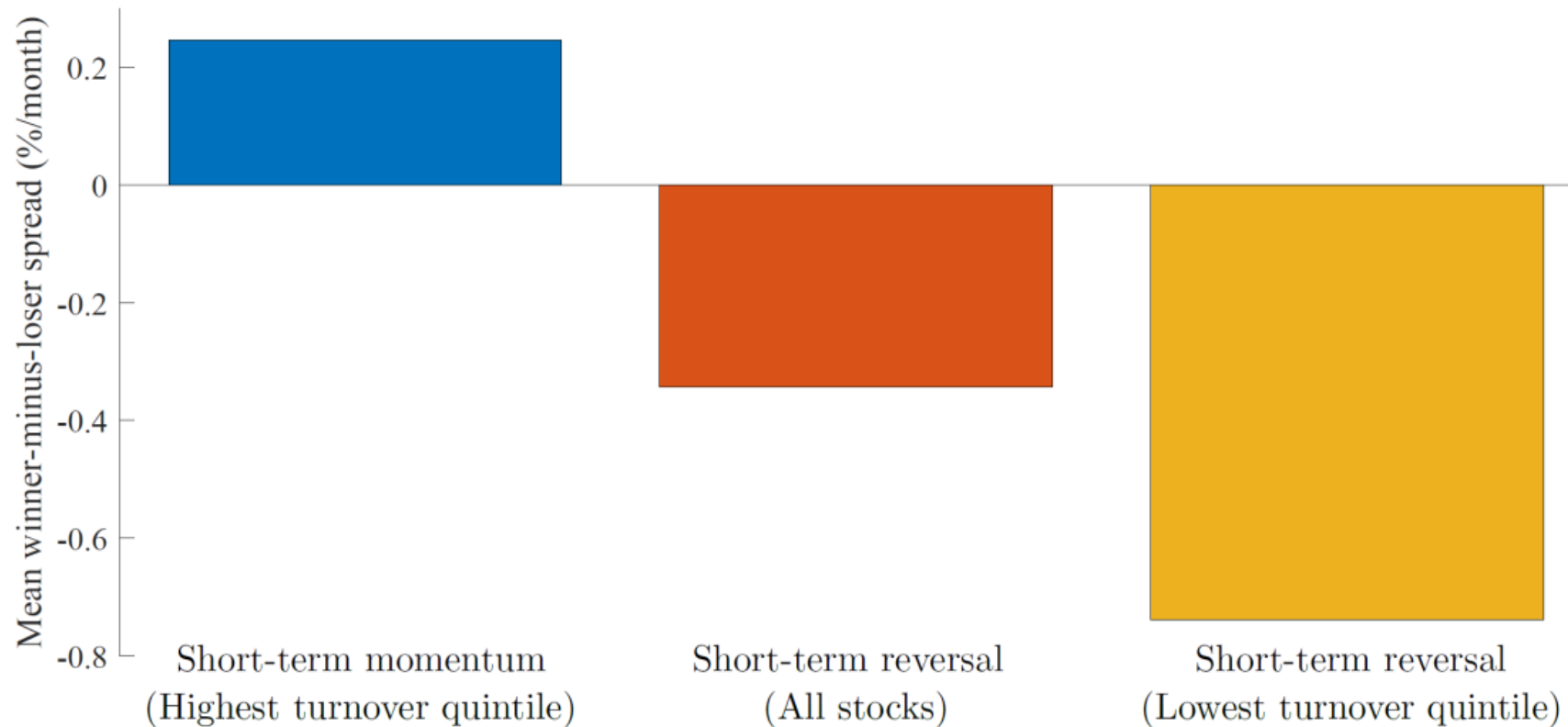
Implications

- These patterns explain several results in the literature
 - Connecting results that were seemingly unrelated...
 - ...And also yield different, more nuanced interpretations
 - Some of which are very different from current common understanding

Related results I

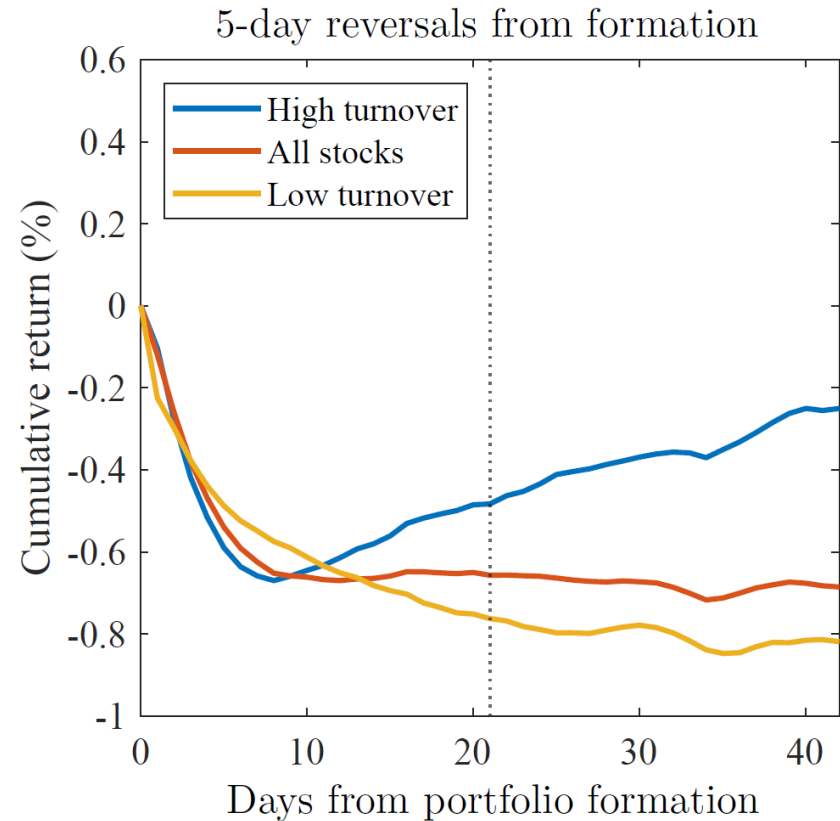
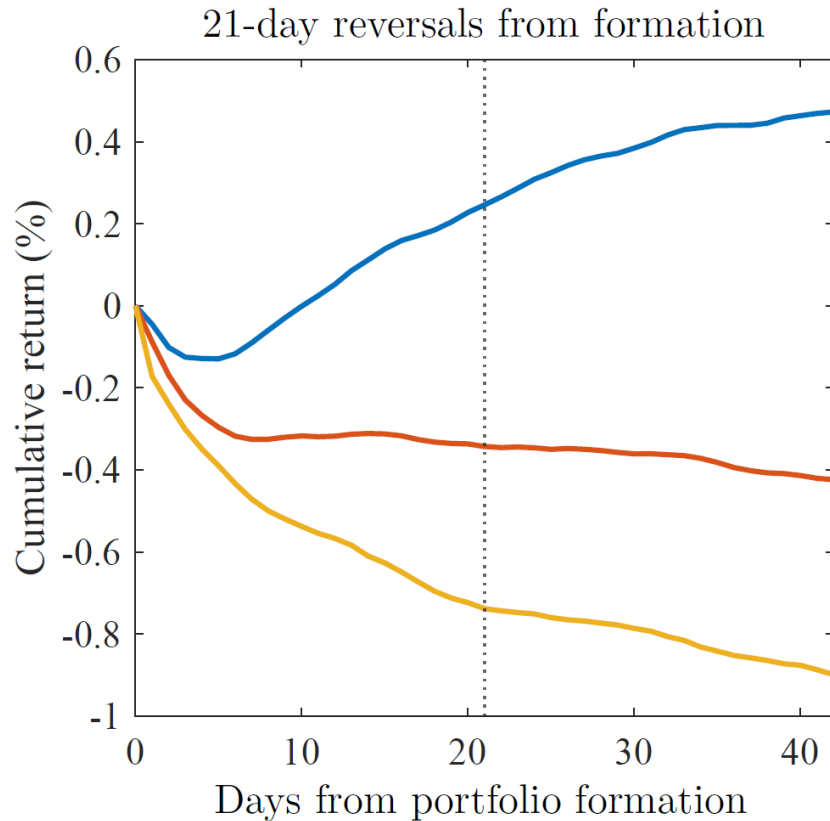
■ Medhat and Schmeling (RFS 2022)

Panel A: Coexistence of reversal and momentum in one-month returns



Days from formation

Panel B: Reversal performance from formation by turnover

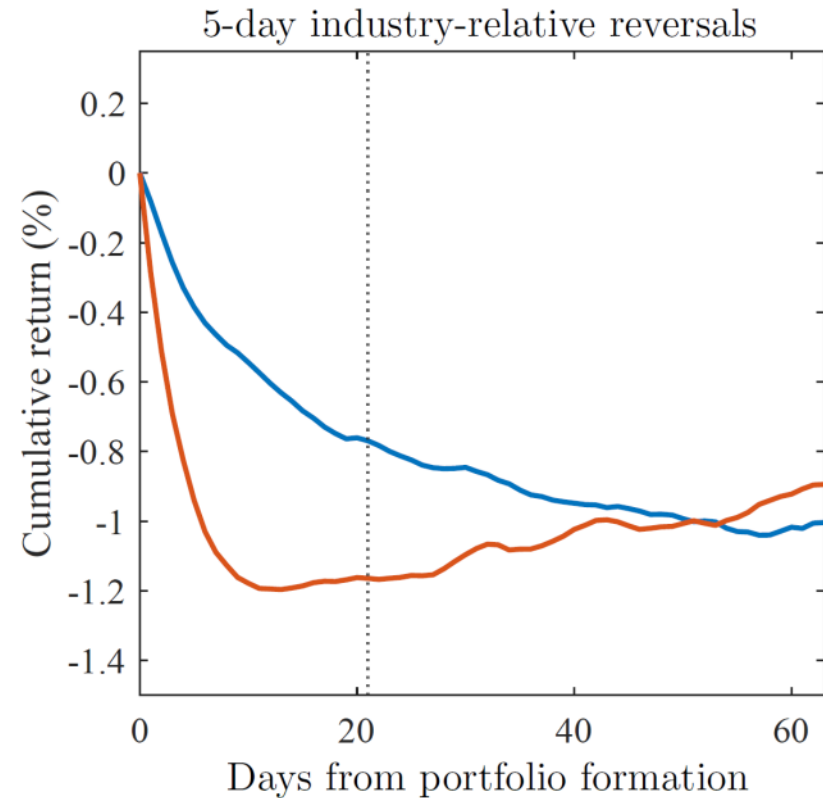
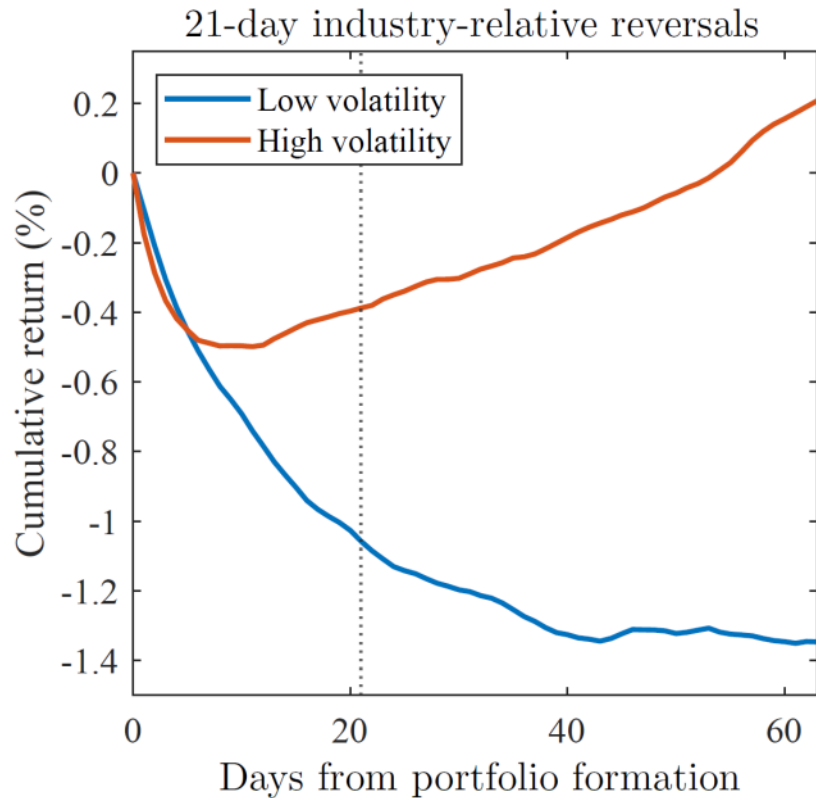


- Also related results of Avramov, Chordia, and Goyal (2006)

Related results II

- Novy-Marx and Velikov (2016)
 - Strong 1-month industry-relative reversals among low-volatility stocks
 - Much stronger than in high-vol.
 - Surprising because they are more liquid, and much cheaper to trade
- Kozak, Nagel, and Santosh (2020)
 - Single most important anomaly for a stochastic discount factor identified by machine learning techniques

Days from formation



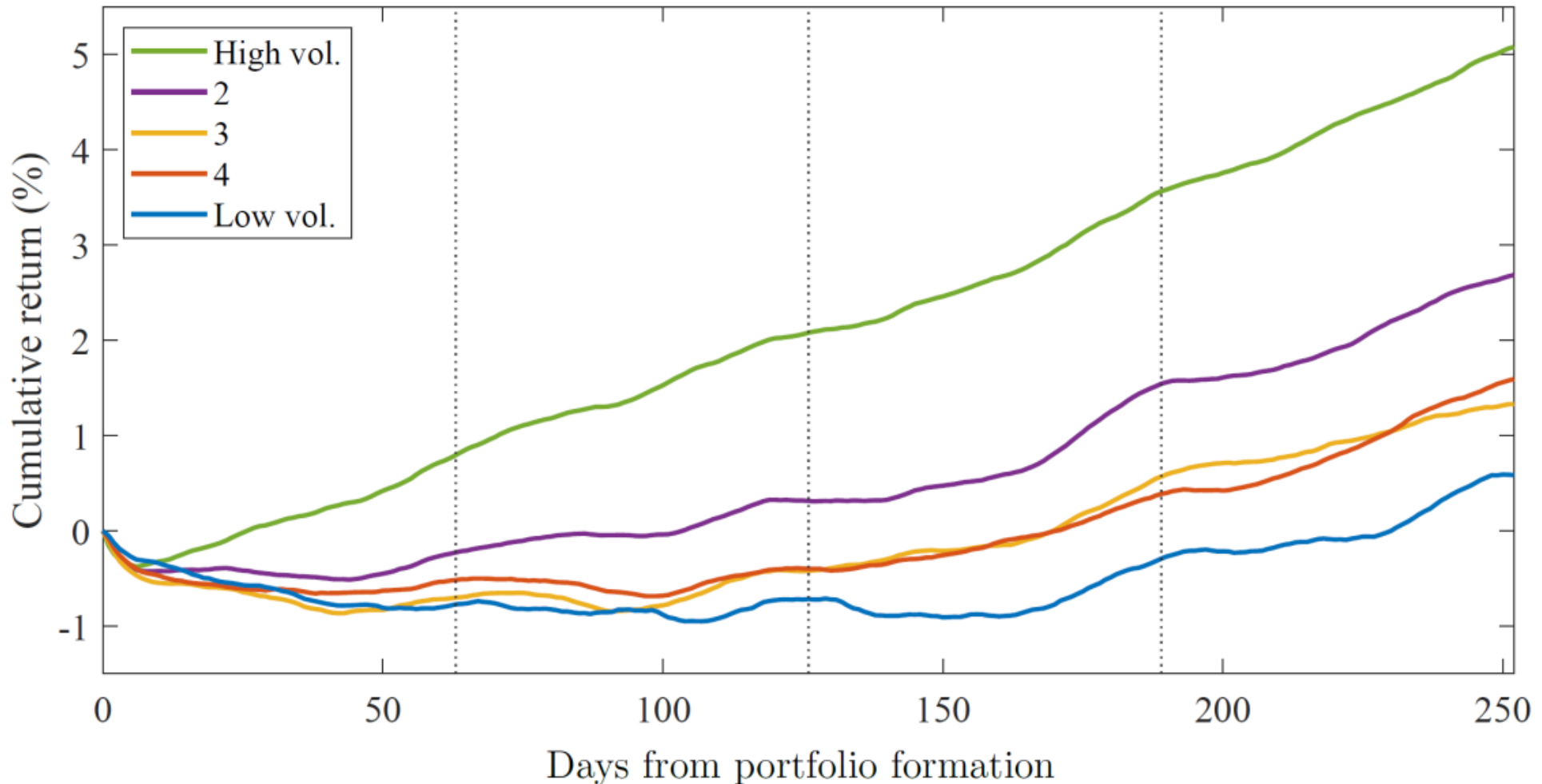
- ❑ Actually stronger for high-vol.!
- Just at a higher frequency, hard to see monthly

Related results III

- Arena, Haggard, and Yan (2008)
 - Momentum stronger for high-volatility stocks
- Novy-Marx (2012)
 - Momentum primarily driven by intermediate horizon past performance
 - Stock returns over the **first half** of the preceding year
 - Not short-run past performance
 - Recent six months matter much less

Long run WML spreads

- Based on one month of stock performance



Connection/refinement

- Figure suggests results of Novy-Marx (2012) should be concentrated in low volatility stocks
 - High vol: Performance over the next six months similar to six months after
 - Low vol: No momentum for six month, momentum after
 - Prediction: Disparity decreasing with volatility

Differences by volatility

	All	NYSE volatility quintile					H-L
		Low	2	3	4	High	
MOM _{12,7}	0.87 [4.57]	0.68 [3.54]	0.77 [4.01]	0.73 [3.68]	1.01 [4.32]	0.96 [4.59]	0.28 [1.16]
MOM _{6,2}	0.22 [1.03]	-0.30 [-1.10]	-0.25 [-1.18]	0.14 [0.57]	0.49 [2.01]	1.17 [5.07]	1.48 [4.66]
Diff.	0.65 [2.86]	0.98 [3.06]	1.02 [3.80]	0.60 [2.11]	0.53 [1.92]	-0.21 [-0.89]	-1.20 [-3.27]

- Unconditional difference in Novy-Marx (2012) driven by low-volatility stocks
 - Strong short-run momentum is high vol

Conclusion

- Cross-sectional implications of illiquidity on the returns to liquidity provision
 - Small → Stronger reversals
 - High volatility → Strong initial reversals
 - Low turnover → Long-lived reversals
 - These three illiquidity variables also capture basically all the cross-sectional variation in Amihud's (2002) popular illiquidity measure

Conclusion

- Accounting for predictable variation in reversal **magnitudes** and **persistence**:
 - Helps explain seemingly disparate results in the literature on reversals and momentum
 - Importance of looking at phenomena at the **appropriate frequency**
 - Should **reduce cost** of demanding liquidity, increase compensation for providing it

Conclusion

- Reversals commonly studied greatly attenuated by trading against two news-related effects: industry momentum and post-earnings-announcement drift
- Basic results all hold beyond the US