



Are You Ready for the Volatility Jumps?

Global Experiences with Leveraged ETFs

A Presentation at the 30th Annual Northfield Research Conference

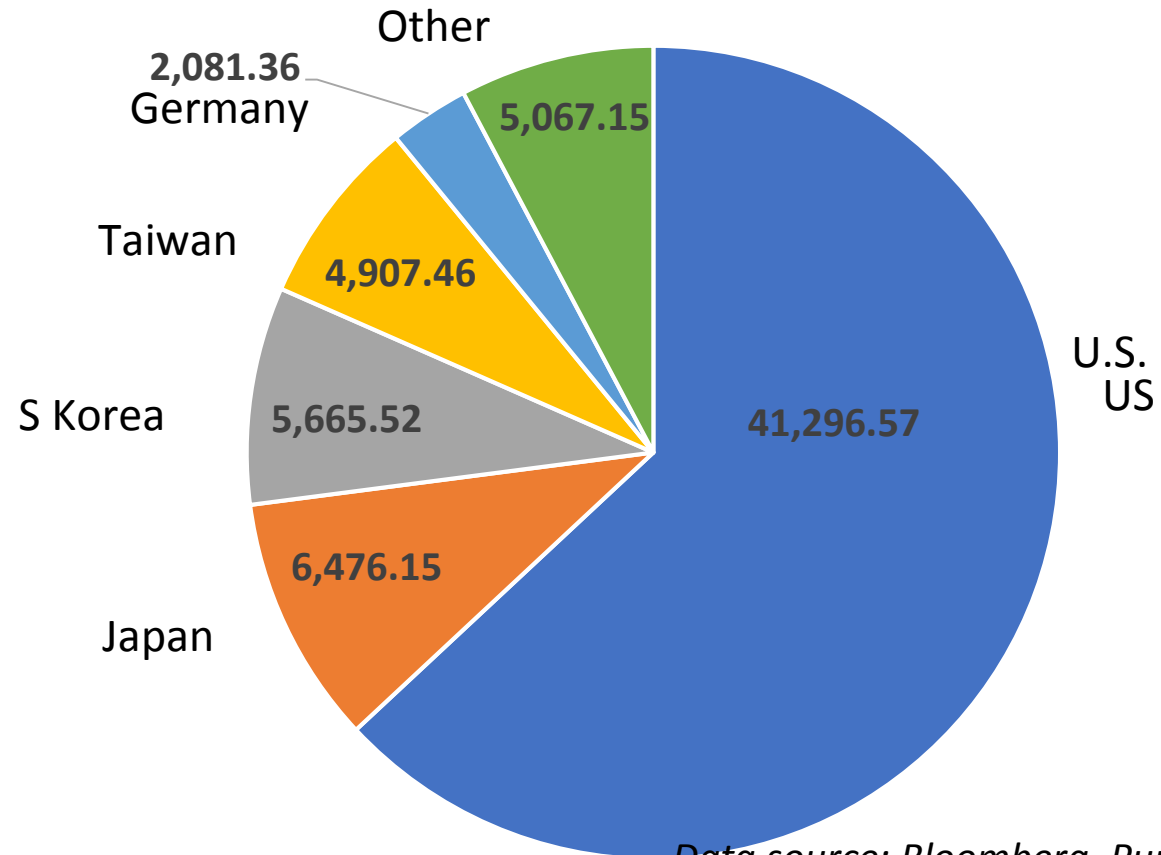
Linda H Zhang
Purview Investments
www.purviewinvestments.com
2018.9.6

Presentation Outline

- The State of Leveraged and Inverse ETFs
 - AUMs, Issuers
 - Products Structures
 - Top Products
- Long- vs. Short-term Volatility: The US Experiences
- The Overseas Experiences: Japan and Taiwan
- An Update of the Study
- Conclusions and Suggestions for Future Studies

Where Are They Listed?

Top Markets by AUM (\$ millions)

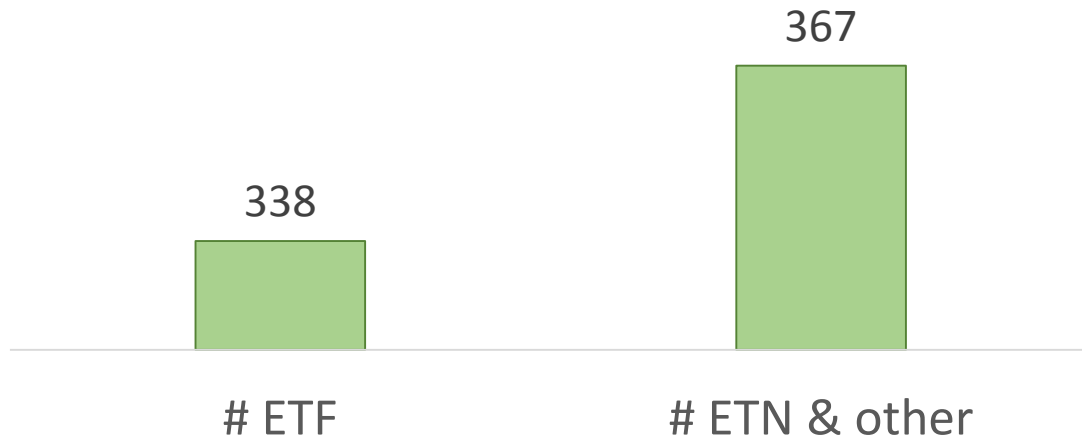


**Global ETP AUM:
\$65.5 Billions**

Data source: Bloomberg, Purview Investments, as of 2018.8.17

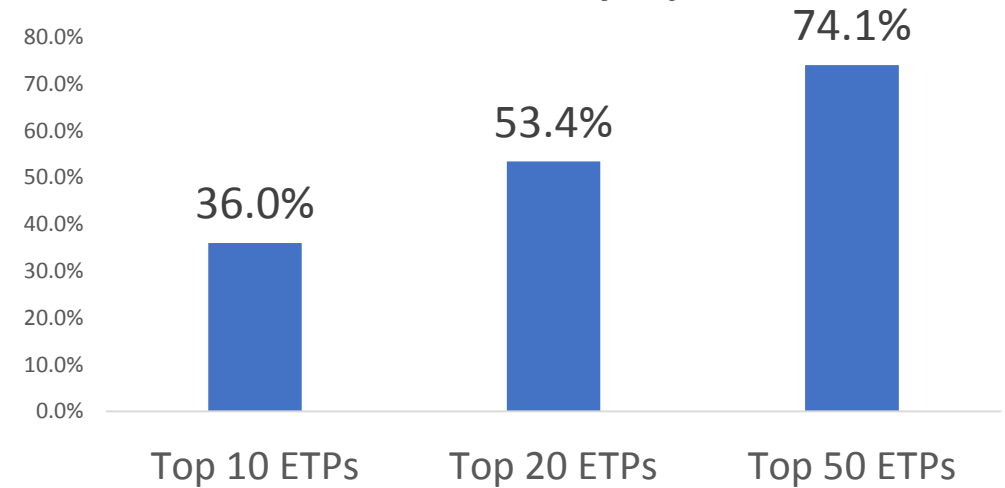
Product Structures, Asset Concentration

Counting Leveraged & Inverse ETFs and ETNs



AUM in ETFs: 80%
ETNs: Mostly in Europe

AUM% Concentration by Top Products



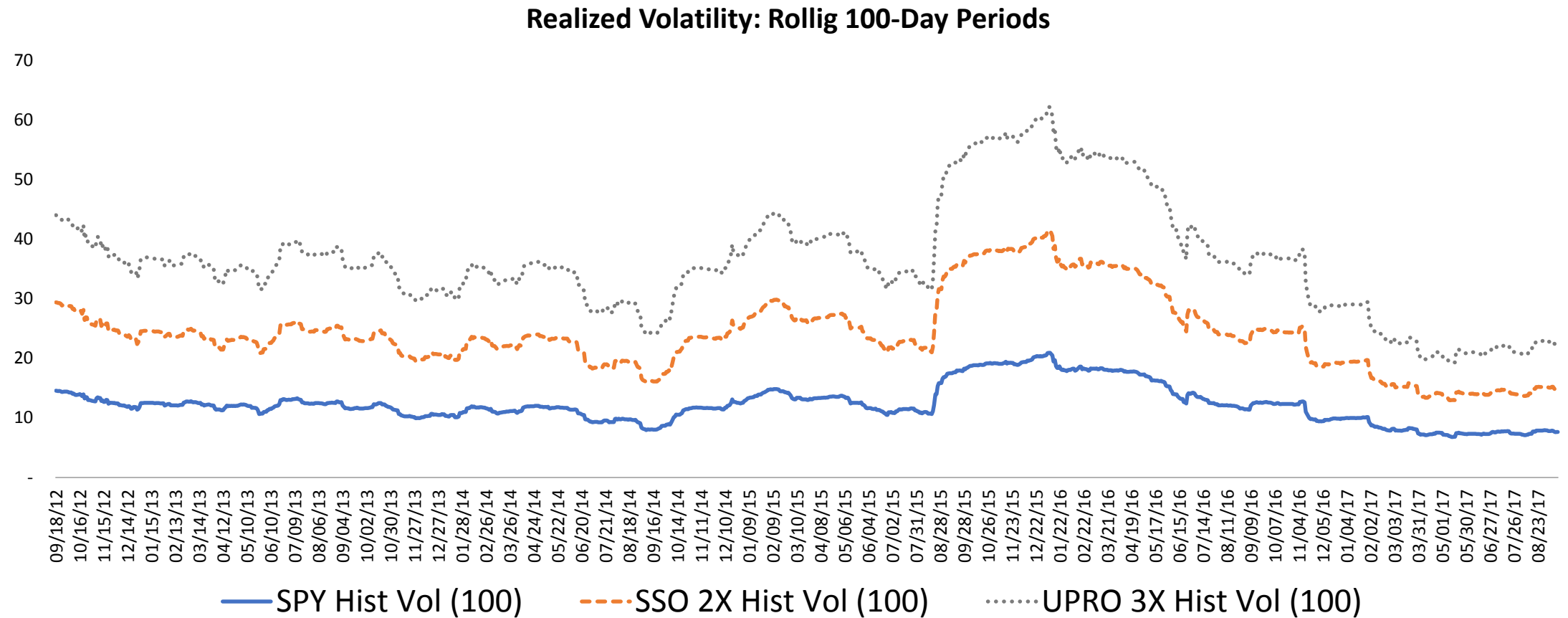
Data source: Bloomberg, Purview Investments, as of 2018.8.17

Global Top Ten Products

Top US						
1	ProShares UltraPro QQQ	TQQQ US	3,619.5	US	3X	Long
3	ProShares Ultra S&P500	SSO US	2,808.8	US	2X	Long
5	ProShares Ultra QQQ	QLD US	1,986.9	US	2X	Long
6	Direxion Daily Financial Bull	FAS US	1,954.2	US	3X	Long
8	ProShares UltraPro S&P 500	UPRO US	1,426.9	US	3X	Long
10	ProShares Short S&P500	SH US	1,316.6	US	1X	Inverse
Top International						
2	NEXT FUNDS Nikkei 225 Leverage	1570 JP	3,489.6	Japan	2X	Long
4	Samsung KODEX Leverage ETF Equ	122630 KS	2,411.5	S Korea	2X	Long
7	YUANTA/P-shares Taiwan Top 50	00632R TT	1,788.8	Taiwan	1X	Inverse
9	Yuanta/P-shares CSI 300 2X Bul	00637L TT	1,337.4	Taiwan	2X	Long

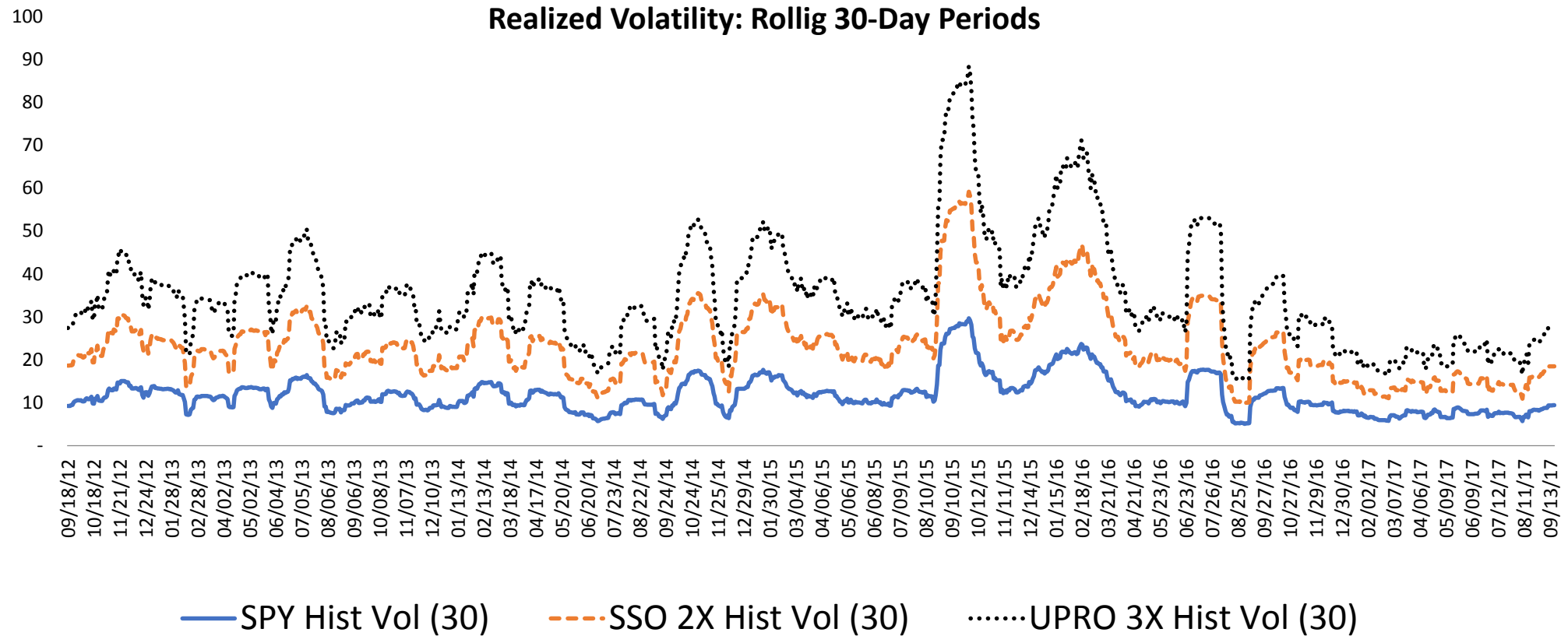
Data source: Bloomberg, Purview Investments, as of 2018.8.17

Realized Volatility: Rolling 100-Day



Data source: Bloomberg, Purview Investments, 2012.9.18 to 2017.9.18

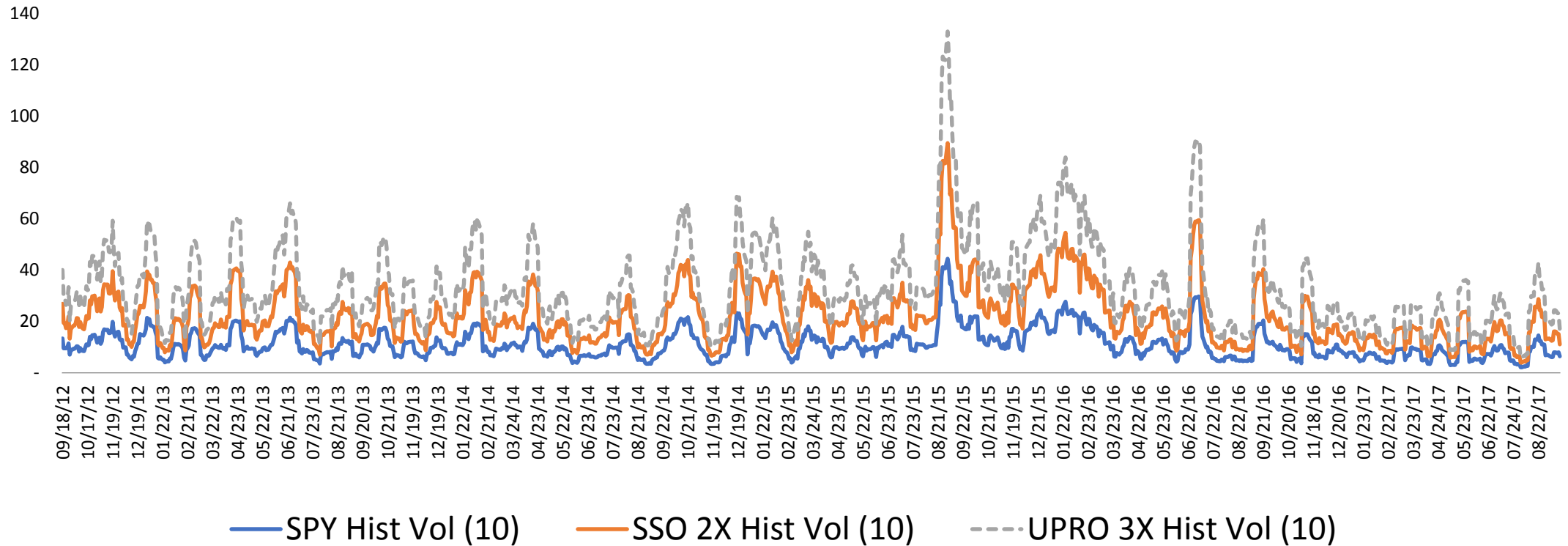
Realized Volatility: Rolling 30-Day



Data source: Bloomberg, Purview Investments, 2012.9.18 to 2017.9.18

Realized Volatility: Rolling 10-Day

Realized Volatility: Rolling 10-Day Periods



Data source: Bloomberg, Purview Investments, 2012.9.18 to 2017.9.18

Measure Volatility Jumps

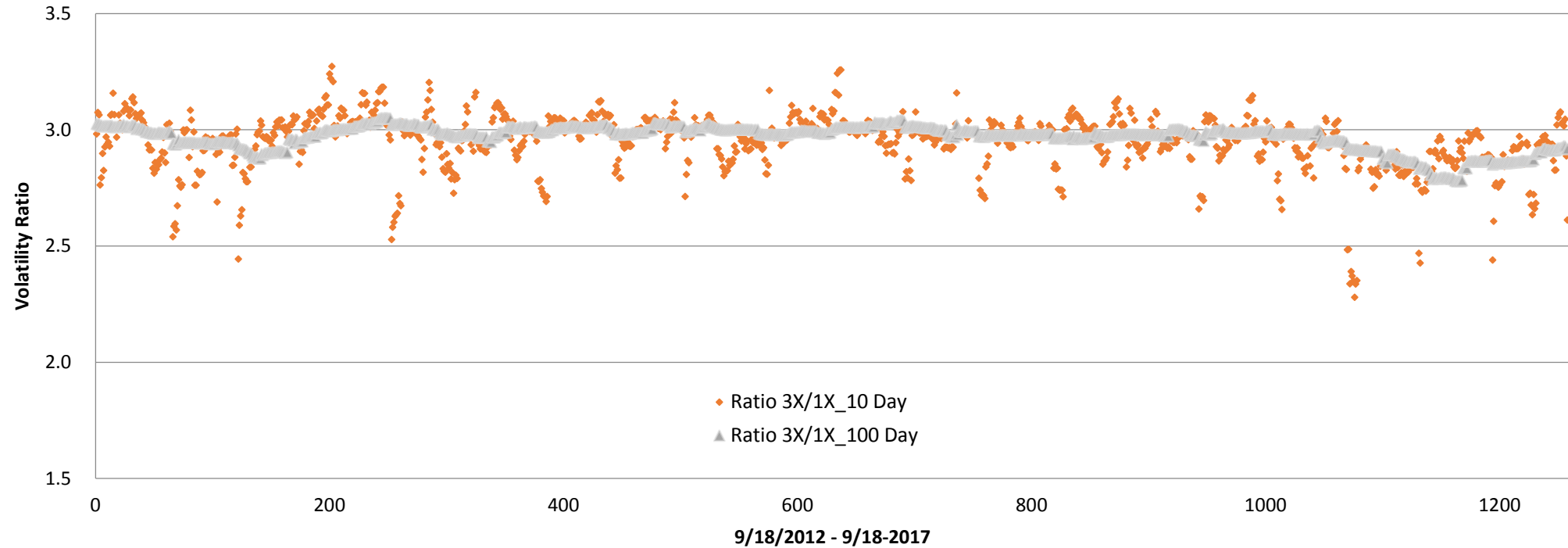
$$\text{Volatility Ratio} = \frac{\text{Volatility of Leveraged ETF}}{\text{Volatility of 1X ETF}}$$

Vol Jumps = Realized Vol Ratio – Leverage Multiple

- Realized Vol Ratio should be very close to leverage multiple.
 - 2X ETF should be twice as volatile as 1X ETF.
 - 3X ETF Should be three times as volatile as 1X ETF.
- Realized Vol Ratio significantly higher than leverage multiple indicates vol jumps.

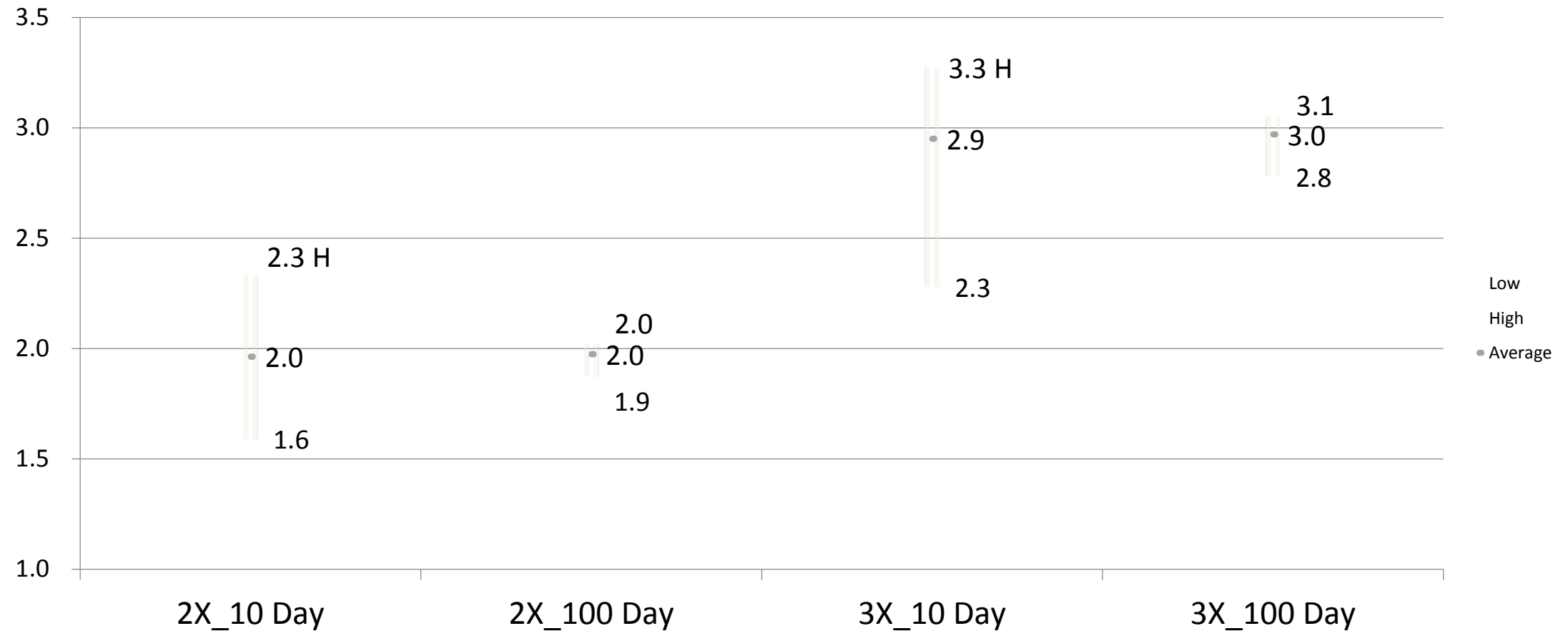
Short-Term Vol Ratio vs. Long-Term Vol Ratio

Realized Volatility: Ratios of 3X over 1X



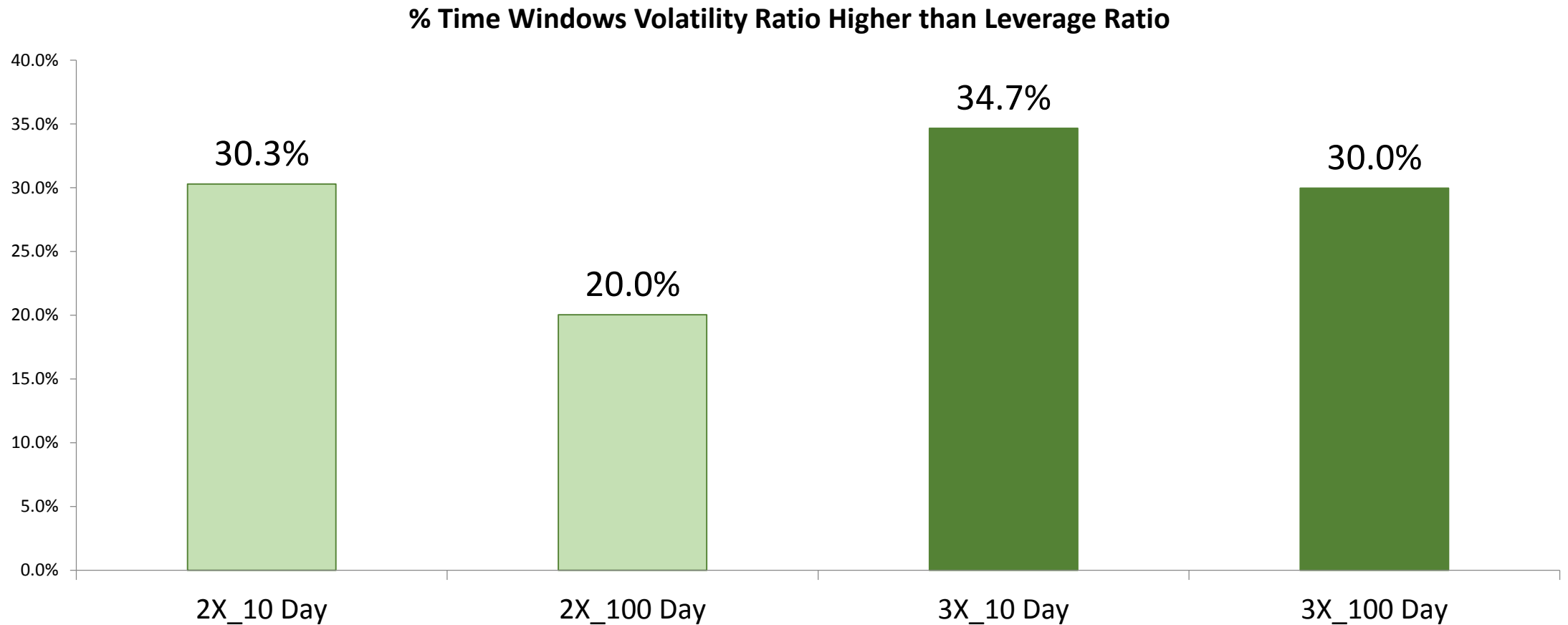
Data source: Bloomberg, Purview Investments, 2012.9.18 to 2017.9.18

Range of Volatility Ratios: Short vs. Long Term



Data source: Bloomberg, Purview Investments, 2012.9.18 to 2017.9.18

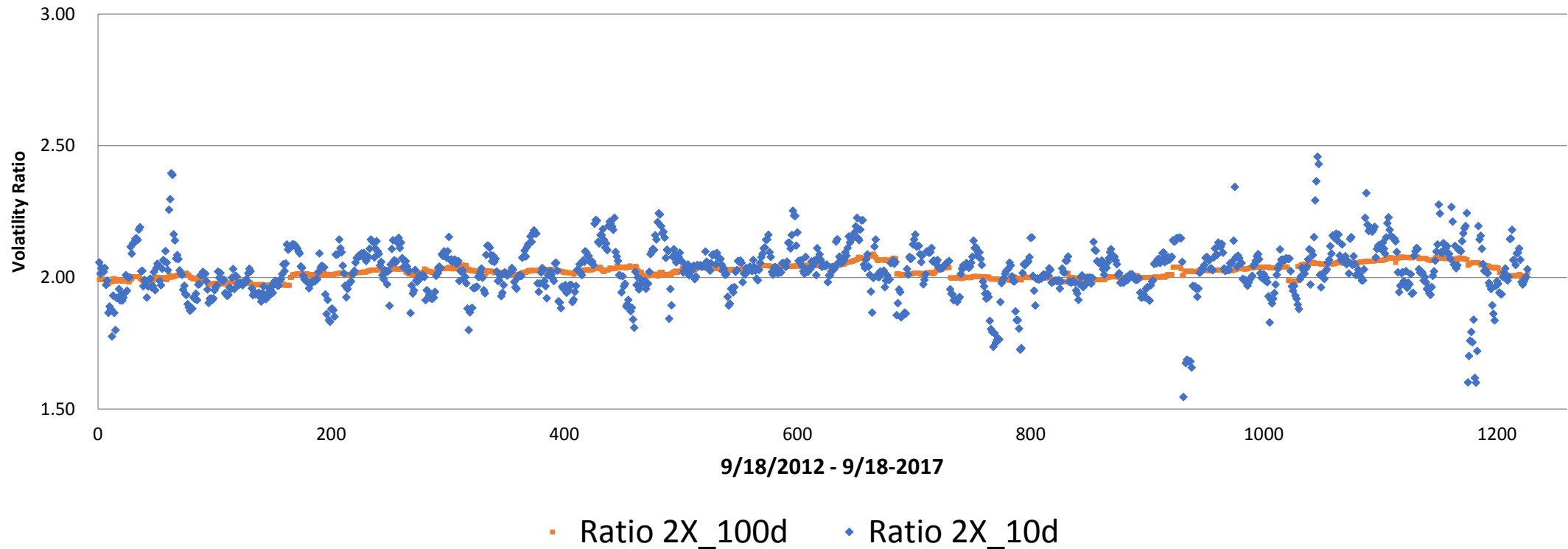
% Time Volatility Ratio > Leverage Multiple



Data source: Bloomberg, Purview Investments, 2012.9.18 to 2017.9.18

Volatility Ratios: Japanese Experience

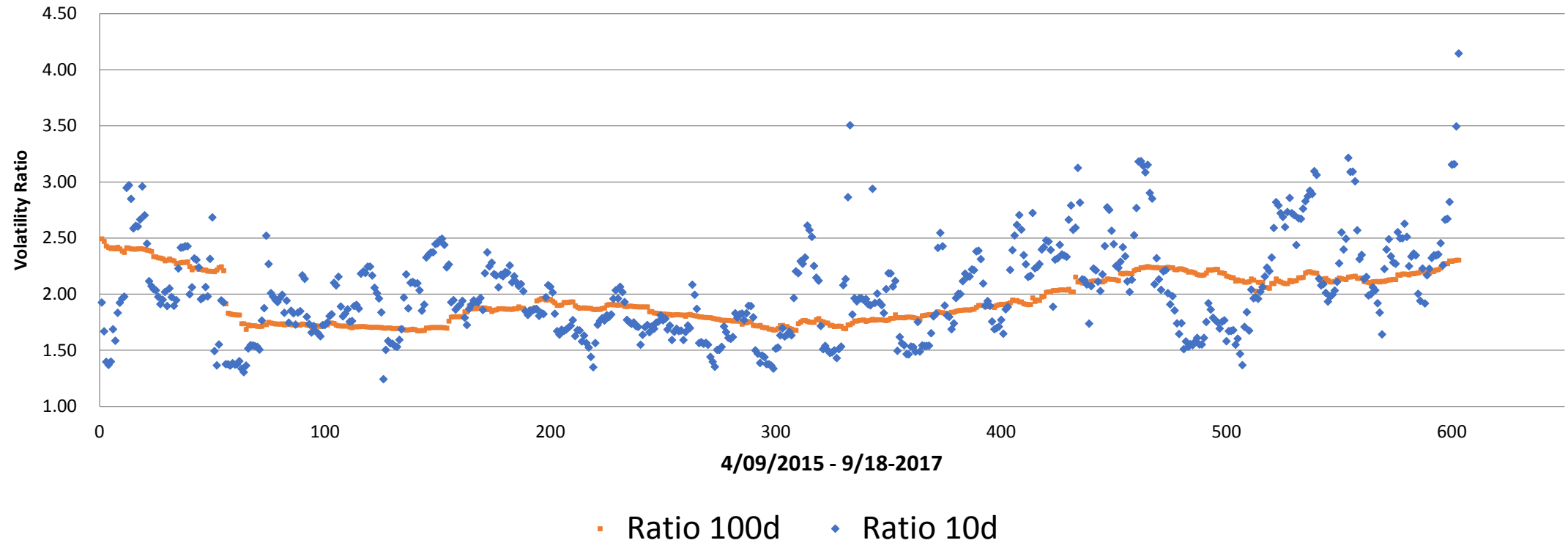
NIKKEI 225 Realized Volatility Ratio of 2X over 1X
Experiences of Short-term vs Longer-term Holding Period



Data source: Bloomberg, Purview Investments, 2012.9.18 to 2017.9.18

Volatility Ratios: The Taiwan Experience

Taiwan SSE180 Realized Volatility Ratio of 2X over 1X
Experiences of Short-term vs Longer-term Holding Periods



Data source: Bloomberg, Purview Investments, 2015.4.19 to 2017.9.18

Cross Country Comparison: Volatility Jumps

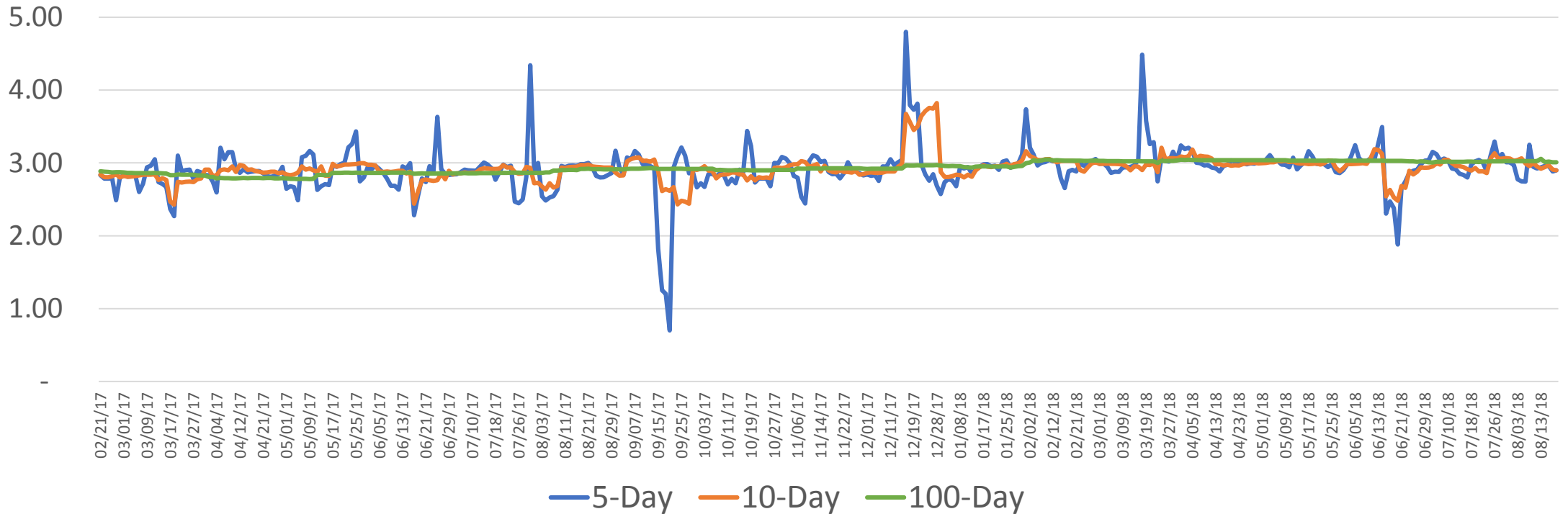
	LONG TERM 100-Day		
Volatility Ratio	US	Japan	Taiwan
Average	2.0	2.0	2.0
High	2.0	2.1	2.5
Low	1.9	2.0	1.7
Range	0.1	0.1	0.8
Stdev	0.03	0.03	0.21

	SHORT TERM 10-Day		
Volatility Ratio	US	Japan	Taiwan
Average	2.0	2.0	2.0
High	2.3	2.5	4.1
Low	1.6	1.4	1.2
Range	0.7	1.0	2.9
Stdev	0.08	0.10	0.42

Data source: Bloomberg, Purview Investments, 2012.9.18 to 2017.9.18

An Update of the Study

Volatility Jumps of 3X Leveraged S&P500 ETF
2017.2.17 - 2018.8.17



Data source: Bloomberg, Purview Investments, 2017.2.17 to 2018.8.17

Conclusions

- The risk behaviors of Leveraged ETFs are in general consistent with how these products are designed in a longer term.
- However, the risk could rise sharply in the short-term, much higher than suggested by the leverage multiple.
- Such short-term volatility jumps became exacerbated in certain overseas markets, when the underlying indices are more volatile.
- Short-term volatility jumps awareness is critical to investors, as leveraged ETFs are primarily intended for short-term trading tools.
- Future research can extend this study to the intra-day volatility, providing insights to investors who use leveraged ETFs as intraday investment or risk management tools.



Q & A

ABOUT PURVIEW INVESTMENTS: *Purview Investments is an independent investment management firm, a Registered Investment Advisor. Purview specializes in global investing and impact investing. The firm launched Purview Impact Solutions, a global multi-asset strategy, using impact ETFs and ETFs consistent with the Environmental, Social and Governance (ESG) principles. The strategy is offered in Separately Management Accounts to both individuals, RIAs, family offices, endowments and institutional investors.*

CONTACT: *To register for complementary research insights, firm updates and product inquiry, check website: www.purviewinvestments.com or email: info@purviewinvestments.com,*



About the Speaker

- *Linda H Zhang, Ph.D, is the CEO and the founder of Purview Investments, a New York based registered independent investment firm offering actively managed ETF solutions, specializing in global investing and ESG investing. The firm also conducts in-depth Exchange Traded Fund (ETF) research, advises and collaborates with ETF issuers and index providers. Dr. Zhang has built an extensive career in asset management industry, and was most recently the Head of Investment Research and Senior Portfolio Manager at Windhaven Investment. She joined the ETF ecosystem from an institutional asset manager MFS, as a fund manager for Global Multi-Asset with global macro long-short overlays and Commodities strategies. At Blackrock, Dr. Zhang served as a lead PM for a global multi-asset mutual fund and institutional mandates, and a key member on the Asset Allocation Committee. She was the head of Quant Strategy Group and a PM at State Street Research. She started her career as a quantitative analyst at Baring Asset Management, developing country, sector, factor, stock selection models, fixed income research and risk modeling.*
- *Dr. Zhang is a co-founder and a board member of Women in ETFs. She is a recipient of the Top Women in Asset Management Awards 2015 by Money Management Executive. She has published in ETF.com, Journal of Index Investing, Journal of Investing, CFA Digest, Journal of Alternative Investments, and is a frequent contributor to industry conferences and business media such as Bloomberg TV, Bloomberg News, Financial Times. Dr. Zhang holds B.A. in Business from University of Regina, Canada, a M.S. in Applied Economics and a Ph.D in Finance from University of Massachusetts at Amherst. She lives with her family in Manhattan, New York City.*