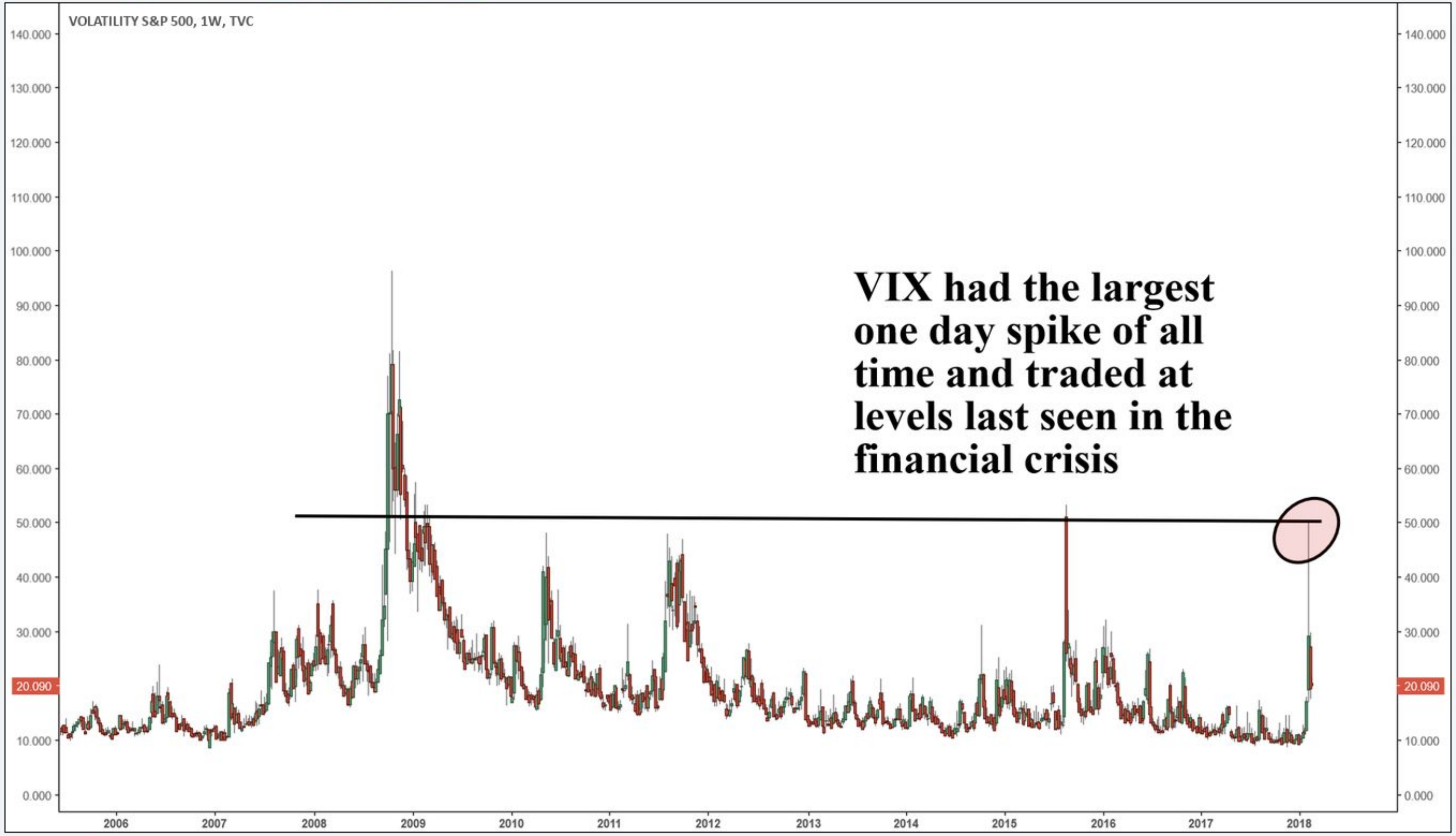
HOW WE SURVIVED THE VOLPOCALYPSE OF 2018



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Biggest One-Day Up Moves for VIX® Index

(Jan. 1990 - Feb. 5, 2018)

Point Moves			% Moves		
1	**5-Feb-2018**	20.01	1	**5-Feb-2018**	115.6%
2	22-Oct-2008	16.54	2	27-Feb-2007	64.2%
3	8-Aug-2011	16.00	3	15-Nov-1991	51.7%
4	15-Oct-2008	14.12	4	23-Jul-1990	51.5%
5	1-Dec-2008	13.23	5	8-Aug-2011	50.0%
6	24-Aug-2015	12.71	6	24-Jun-2016	49.3%
7	29-Sep-2008	11.98	7	21-Aug-2015	46.4%
8	24-Oct-2008	11.33	8	17-May-2017	46.4%
9	18-Aug-2011	11.09	9	24-Aug-2015	45.3%
10	20-Jan-2009	10.54	10	10-Aug-2017	44.4%

Sources: Bloomberg and Cboe. www.cboe.com/VIX

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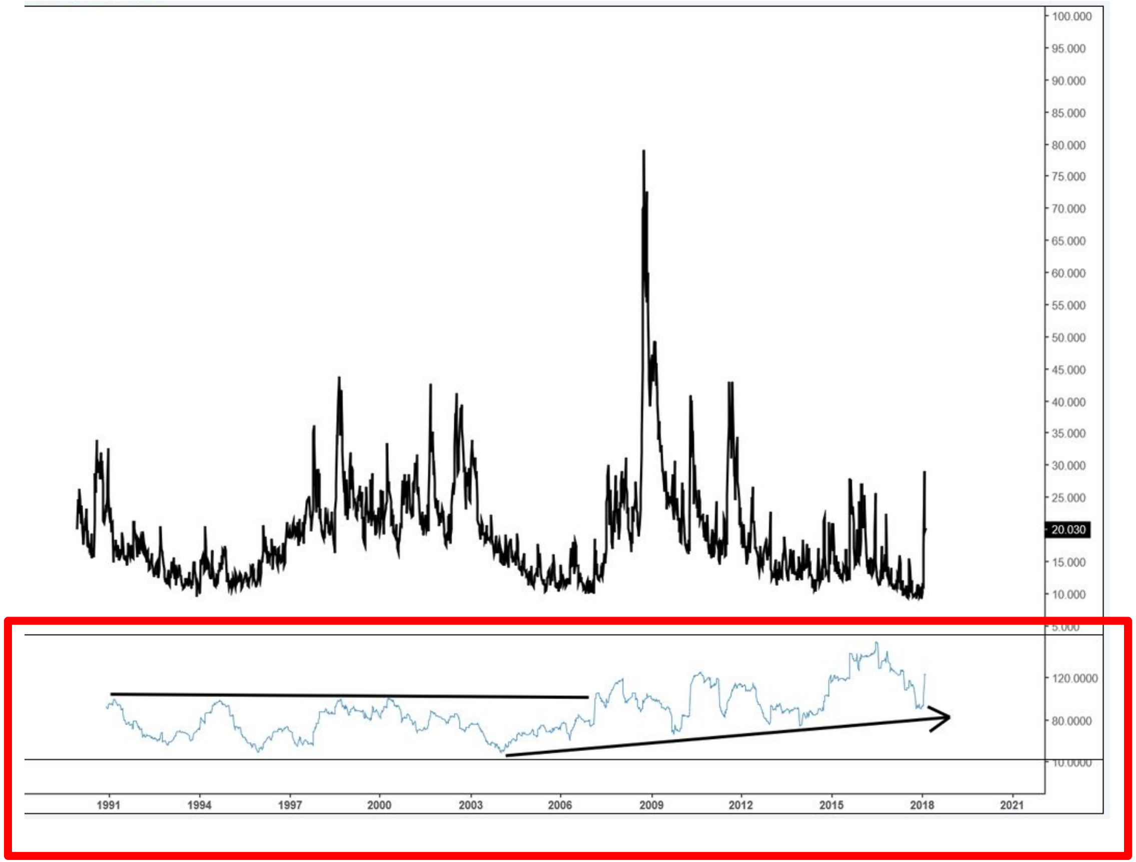
What caused the super spike in VIX?

- Crowding — too many people needed to rush for the exit at once
- Algos — market has become more and more mechanized, machines make quicker decisions than humans thus market moves faster
- Leveraged and inverse ETPs — The daily rebalancing creates momentum feedback loops

The VIX has gotten more jumpy in modern times likely due to machine trading and creation of VIX derivatives



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Implications For Trading

- Large moves are going to happen on shorter and shorter timeframes
  - In the olden days trends took weeks to play out
  - Now we’re seeing moves take place in days
  - E.g. There’s been lots of “snap back” action in the SPX ever since 2008, leveraged is cleared out quick and then market resumes
- Largest risk for leveraged traders are intraday flash crashes that create a margin call
- <u>Position sizing and hedging is key</u>

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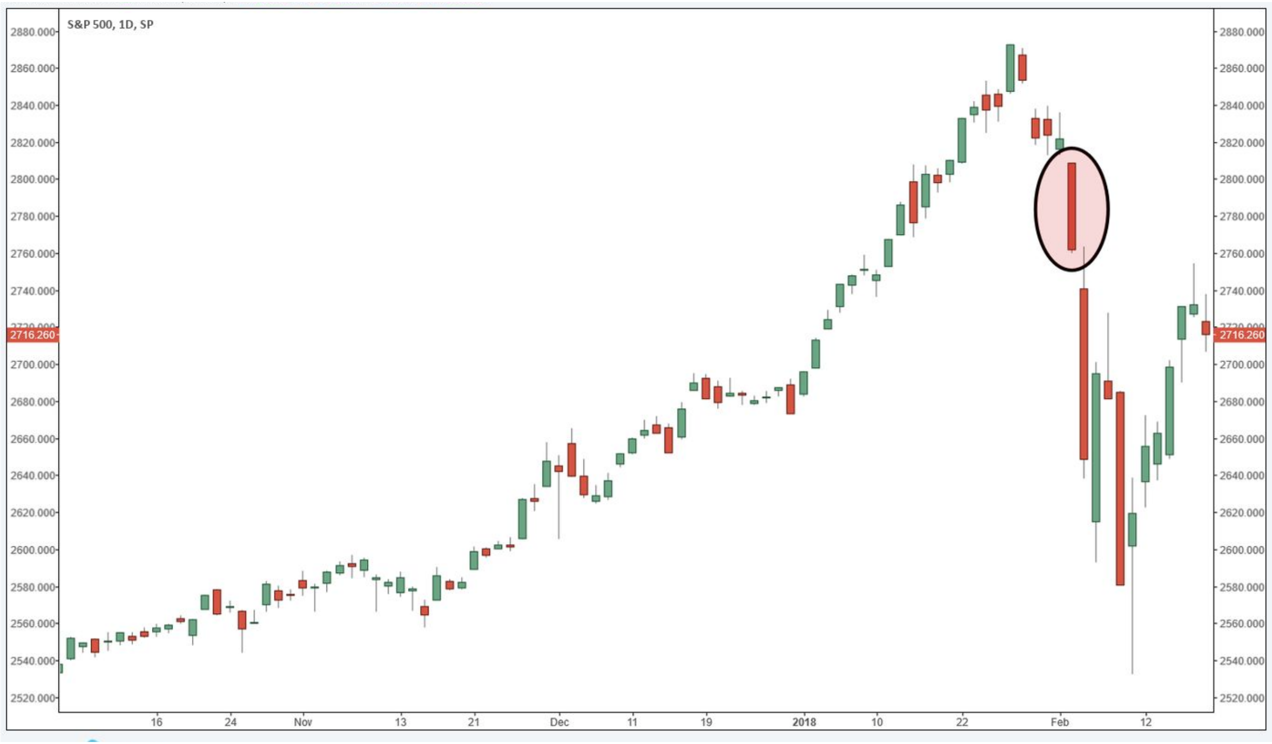
How We Survived

- ➢ Did not panic
- ➢ Followed our plan
- ➢ Had good position sizing on so even a blow up wouldn’t cripple us
    - Peace of mind is critical to operate correctly

Friday, February 2nd Warning Signs

Market had a large down day on Friday and realized vol was expanding



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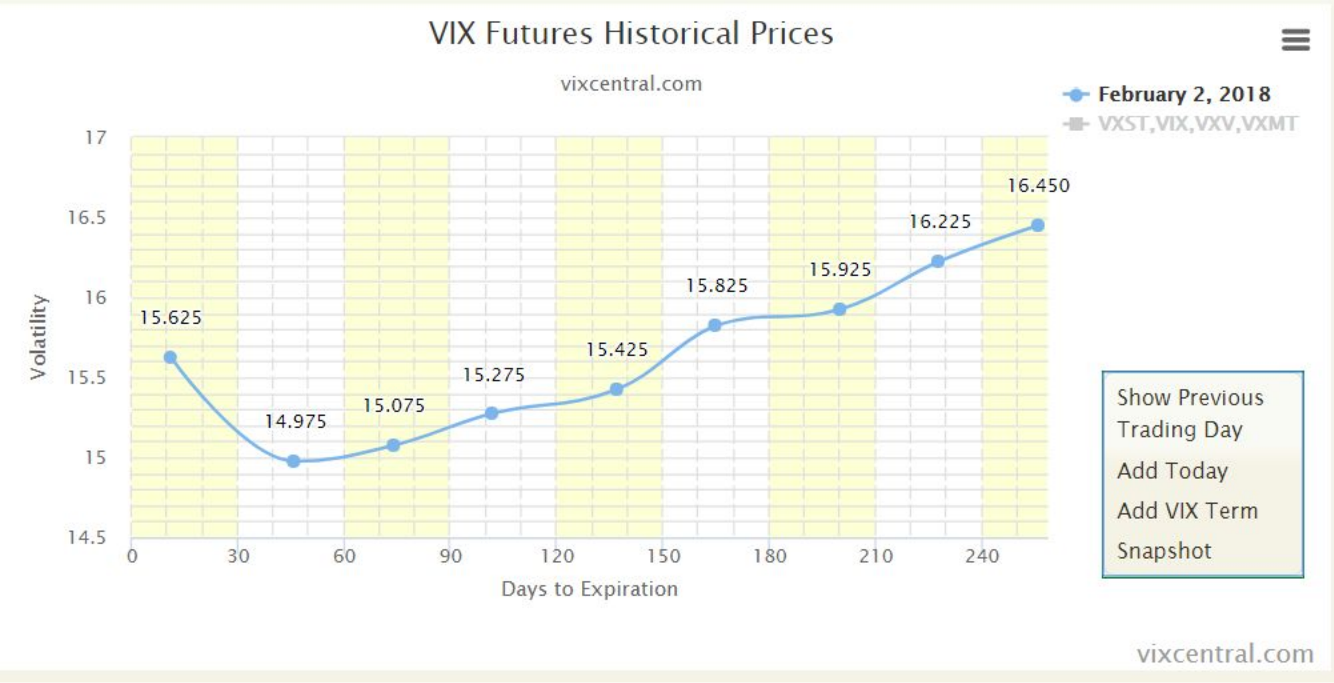
Front month VIX future inverted



VIX term structure (VIX/VIX3M) entered the danger zone for shorts

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February 5th, 2018

- ➢ The market gapped down and consistently sold off
- ➢ Once the market went down 70 points for the day systematic selling kicked in
- ➢ These sellers were price agnostic and were selling purely out of risk control
- ➢ The feedback loop initiates and selling begets selling
- ➢ Volatility complex reacts by rallying big time
- ➢ We reversed our vol trade before things got ugly

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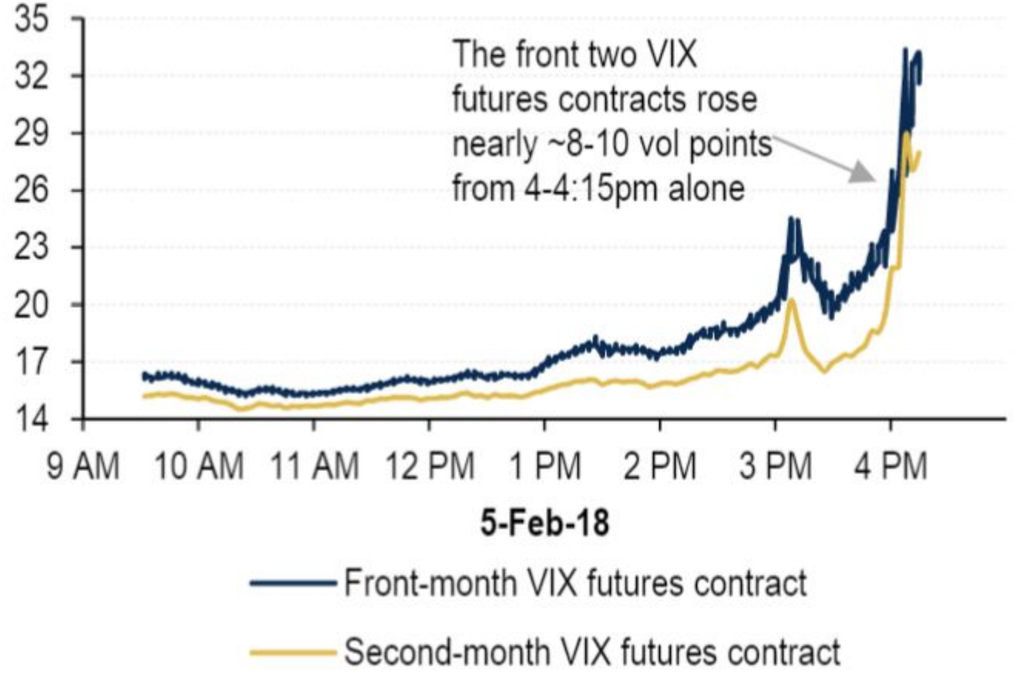
Why Did Vol ETPs Get Hammered After Hours?

- Vol ETPs (both inverse and leveraged) have to rebalance their exposure at the end of each day
- They rebalance in the **same direction** causing a massive feedback loop if a large intraday move occurs
- Inverse funds need to cut losses and buy back short VIX futures
- Leveraged funds need to add to their winners and buy more VIX futures

Why Did Vol ETPs Get Hammered After Hours?

- This creates a vicious feedback loop
- Managers of these ETPs have a ton of vega to buy and they push prices further against themselves
- Classic “short squeeze” set up causes further losses for vol shorts

Chart 12: The parabolic rise in the front two VIX futures into the close was a classic sign of technical buying pressure



Source: BofA Merrill Lynch Global Research, Bloomberg. Based on 1min interval intraday data.

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Takeaways

- ➢ Always have a plan — know what you are going to do in every possible future scenario
  - Hedge the tails!
- ➢ Machine controlled markets move **FAST**
  - But that creates tremendous opportunities for smaller traders that are well prepared
  - You can generate huge Alpha by anticipating these squeezes and feedback loops caused by automatic risk management algos
  - These opportunities don’t last long but pay off big time if you can strike quickly