

# There is so much more than selling “tourism” in volatility investing

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# Volatility + Risk Premium = Selling?

## ► Volatility risk premium: a carry strategy

### ► Idea

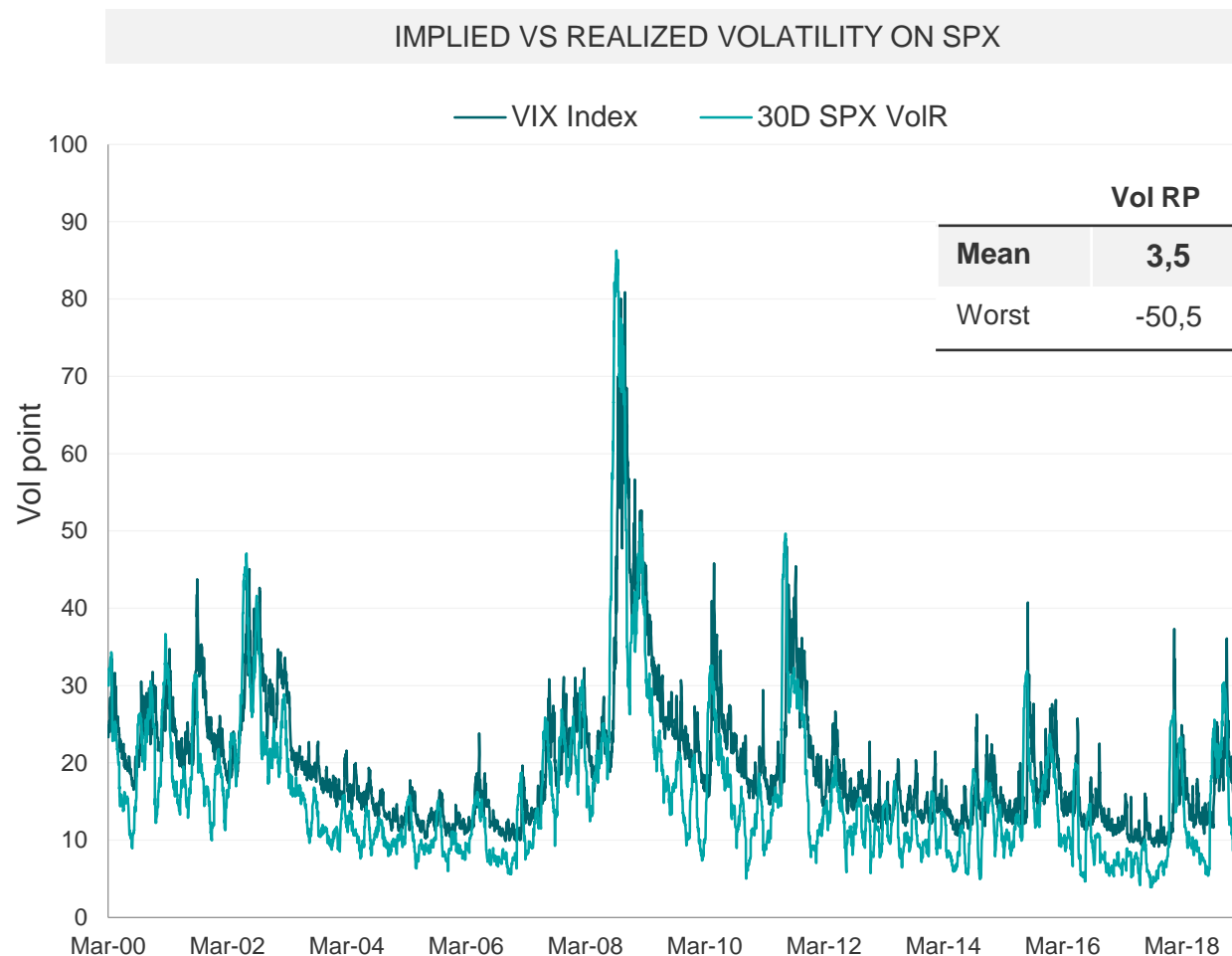
- Volatility Carry Risk Premium aims to monetize difference between implied volatility and realized volatility

### ► Economical Intuition

- Supply/demand imbalances

### ► Empirical Explanations

- Significant excess demand for options can increase the premium
- The risk premium is a compensation for tail risk

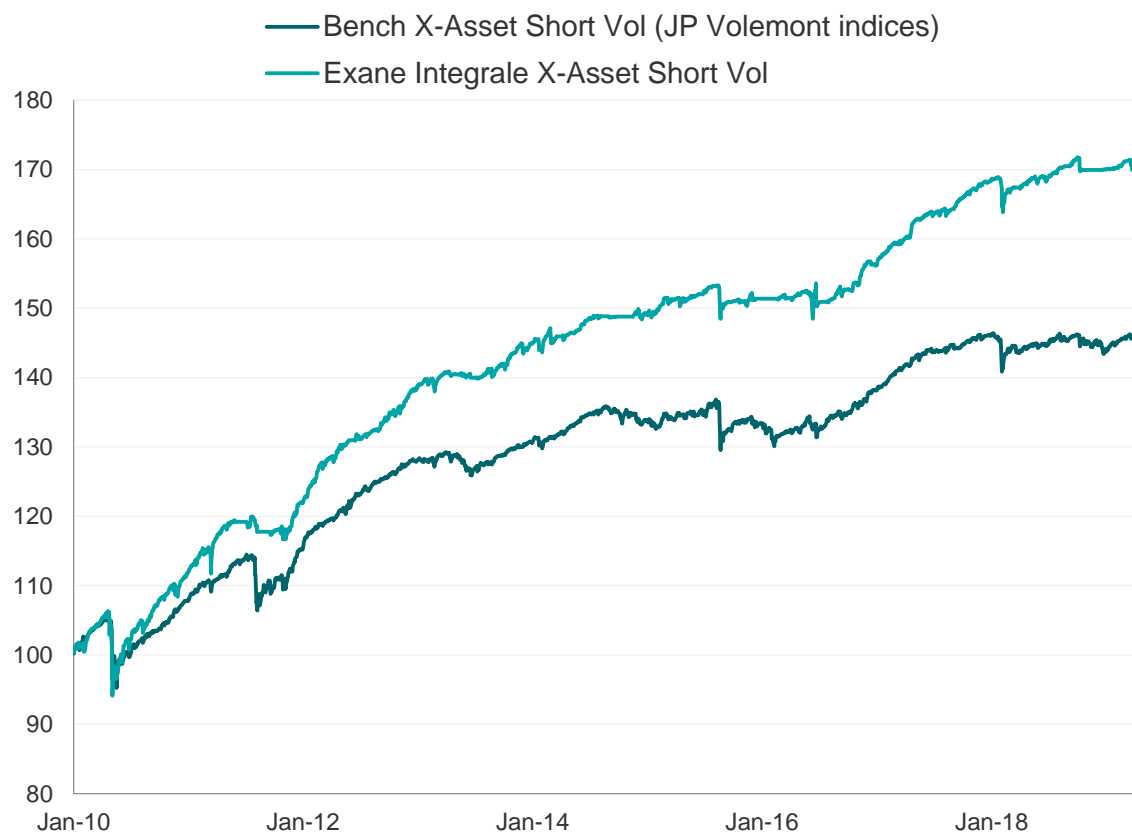


# Comparison Exane X-asset short vol & Benchmark

► Short vol generates yield on a x-asset basis (Equity/FX/Commo here) on the long run...

► ... but with clear correlation to market and many drawdowns :

SHORT VOL PERFORMANCES



	Benchmark X Asset Short Vol	Exane Integrale X Asset Short Vol
Return	4,96	7,52
Sdev	5,00	5,00
<b>SR</b>	<b>0,99</b>	<b>1,50</b>
MDD	9,84	9,19
MDD/Sdev	<b>1,97</b>	<b>1,84</b>
SPX Correlation	<b>51,80%</b>	<b>43,60%</b>

# Zoom on Feb18 : Crowdedness and Tourism

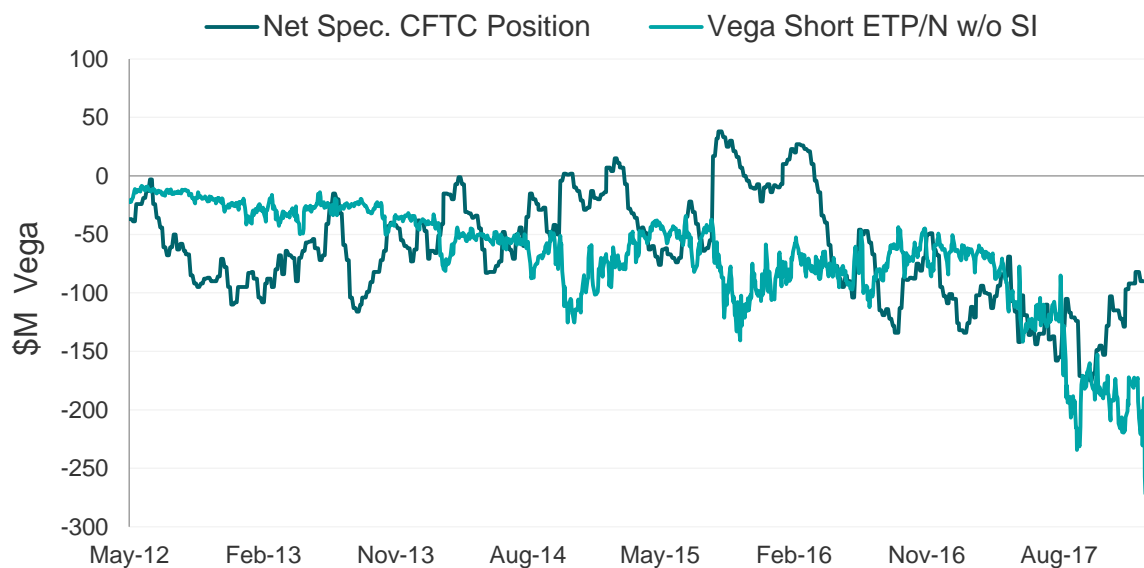
REB. ETP/N SHORT/LEVERAGED FOR 1 PT MOVE



## ► Crowdedness at the beginning of 2018

- Half of average daily volume on VIX front month required to hedge 1pt move in VIX
- On 5th of February VIX goes from 17 to 37...

MASSIVE OVERCROWDING ON SHORT VIX



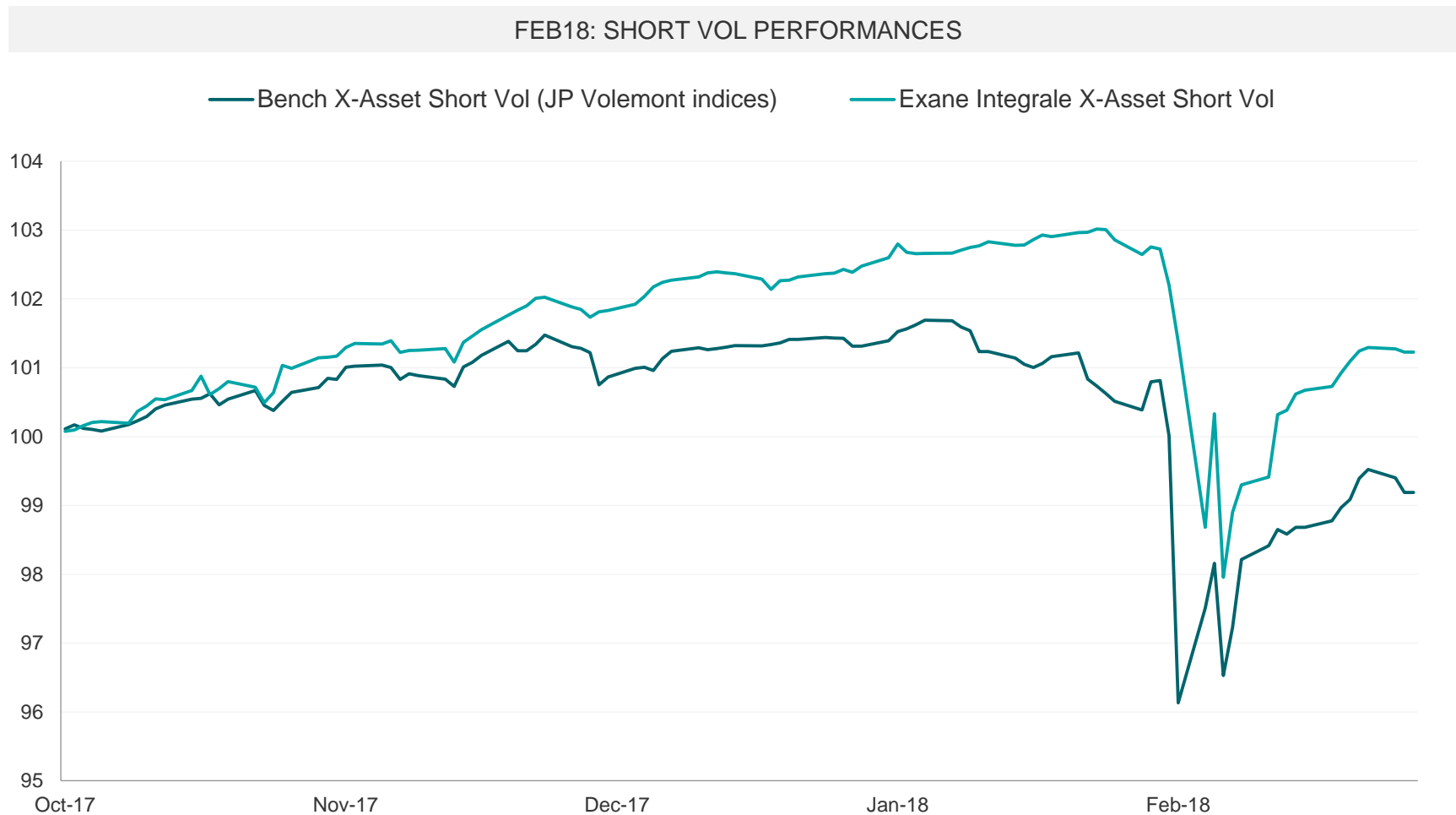
## ► Short vol is everywhere

- Pension overwriting : \$45 Bn
- Option selling Funds : \$10 Bn
- Volatility Risk Premium Bank proprietary Indices: \$200 M on S&P 1M



# Zoom on Feb18 : Volmageddon!

► Helped by tourism, sometimes Tail Risk materializes...

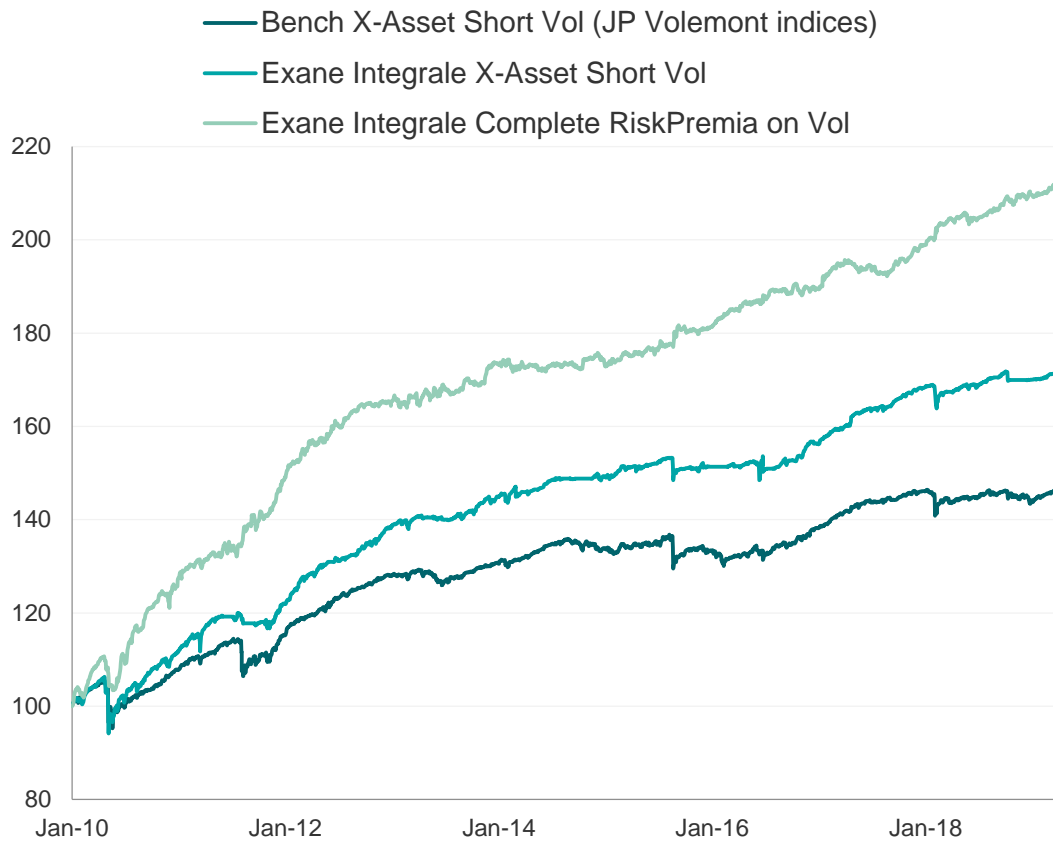


# How can we survive a Volmageddon?

- ▶ Volatility is an asset on its own... and guess what ?  
If you can sell it, you can also buy it!

- ▶ Volatility Relative Value aiming at building long/short volatility is the main driver of outperformance

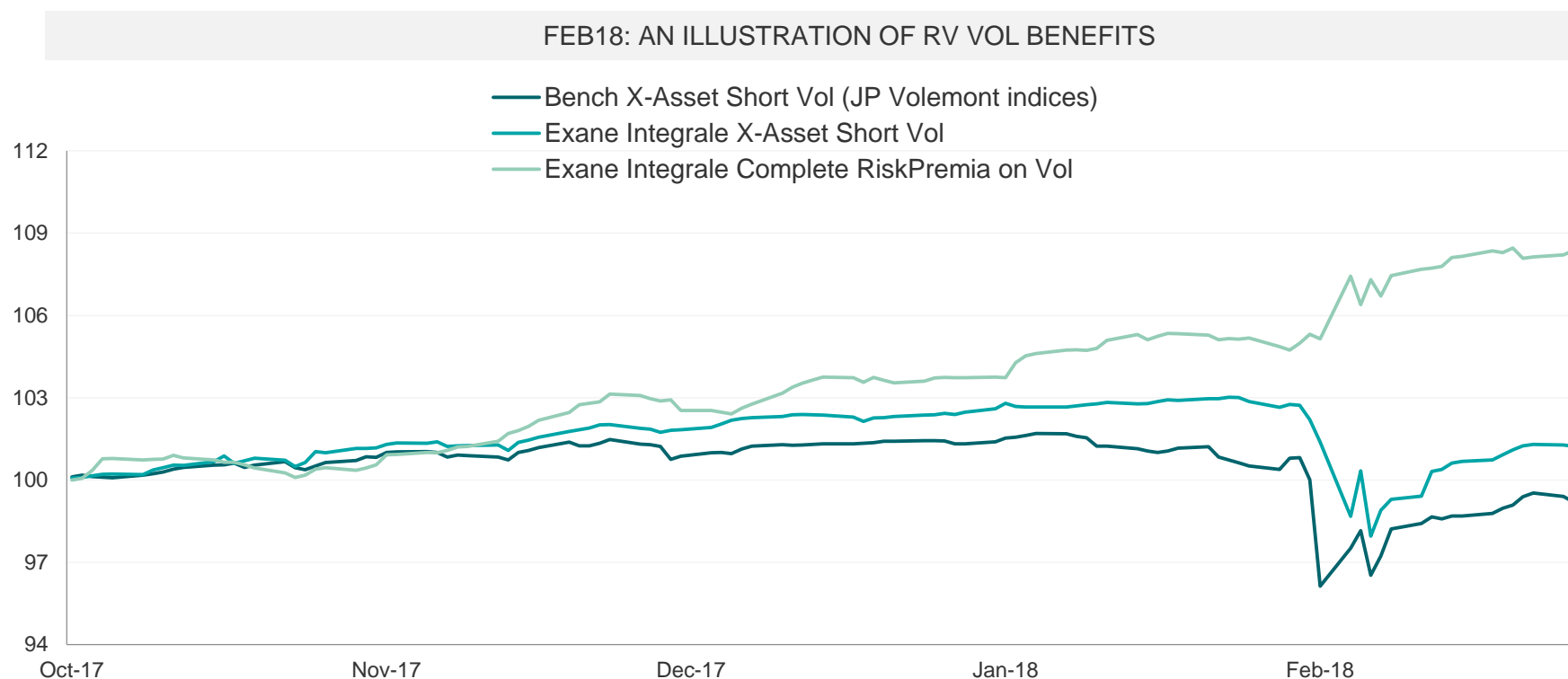
## VOL RELATIVE VALUE BRINGS PERFORMANCE AND DAMPEN RISKS



	Benchmark X Asset Short Vol	Exane Integrale X Asset Short Vol	Exane Integrale Complete RiskPremia on Vol
Return	4,96	7,52	11,59
Sdev	5,00	5,00	5,00
<b>SR</b>	<b>0,99</b>	<b>1,50</b>	<b>2,32</b>
MDD	9,84	9,19	7,05
MDD/Sdev	<b>1,97</b>	<b>1,84</b>	<b>1,41</b>
SPX Correlation	<b>51,80%</b>	<b>43,60%</b>	<b>9,60%</b>

# Zoom on Feb18 : RV Vol on rescue

## ► Tourism is profitable



## ► Examples of winning RV volatility pairs in Feb18

Long	Short	Entry time	Maturity	Gain on 5th Feb week
FXI US	HSI Index	04/01/2018	Jun18	6 vol pts
AUDJPY	AUDUSD	22/01/2018	Apr18	2 vol pts

# How to construct a Volatility Relative Value strategy?

A classification problem with 2 key variables

- ▶ When you enter a long/short vol trade @Spread for maturity T, your expected PnL at t is:

$$PnL_t = \frac{t}{T} RealizedSpread_{0 \rightarrow t} + \frac{T-t}{T} ImpliedSpread_{t \rightarrow T} - Spread$$

- ▶ Then, we need to estimate the realized PnL and the implied PnL

- Realized PnL:  $RealizedPnL_t = \frac{t}{T} (RealizedSpread_{0 \rightarrow t} - Spread) = \frac{t}{T} (EWMA_{Spread} - Spread)$

Where  $EWMA_{Spread}_t = \sqrt{\alpha R_{long}^2 + (1-\alpha)\sigma_{long}^2}_{t-1} - \sqrt{\alpha R_{short}^2 + (1-\alpha)\sigma_{short}^2}_{t-1}$

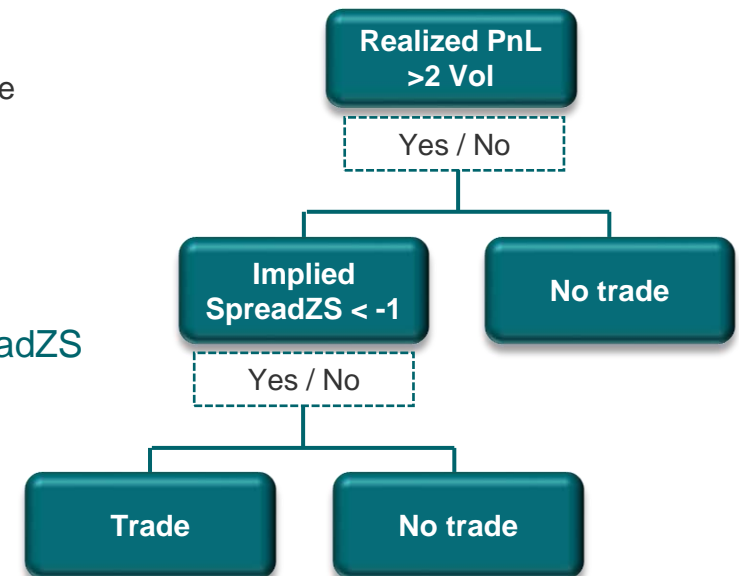
Where  $\alpha = 1 - \frac{2}{T+1}$  with  $T = maturity$

- Implied PnL: rely on mean reversion of implied spread and build an absolute Z-Score

$$ImpliedSpreadZS = \frac{ImpliedSpread_T - \overline{ImpliedSpread_T}}{StDev(ImpliedSpread_T)}$$

- ▶ Select Volatility pairs with strong Realized PnL and very negative ImpliedSpreadZS

- Simplest way: decision tree with arbitrary trigger levels



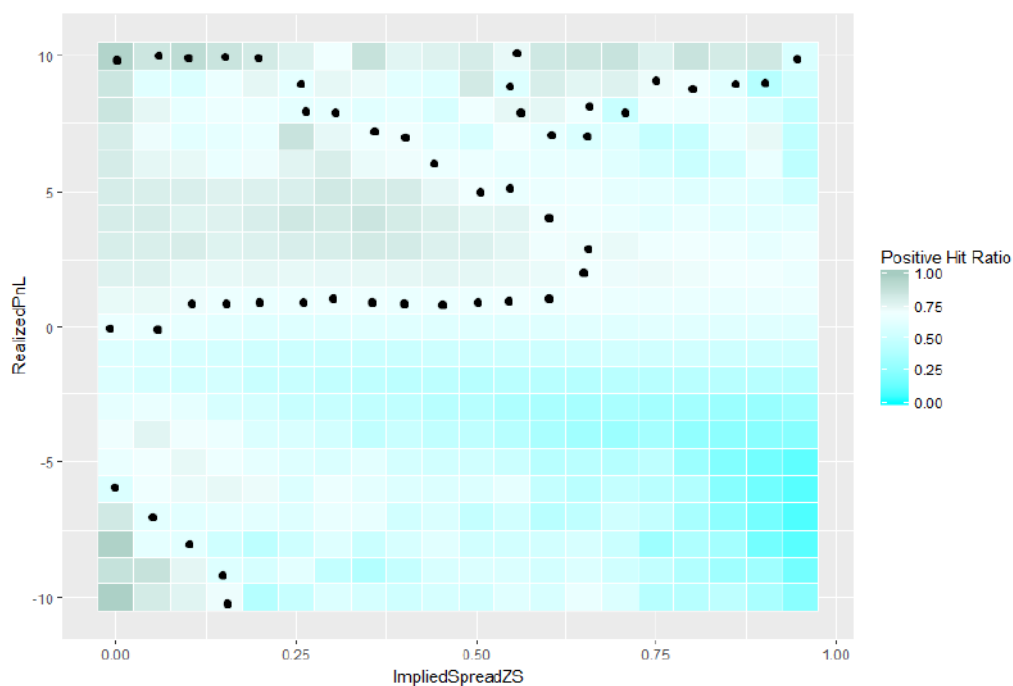


# Support Vector Machine to select RV pairs

- ▶ A logistic regression for a linear decision boundary would be:

$$\text{logit}(P[\text{PnL} > 0]) = a + b * \text{RealizedPnL} + c * \text{ImpliedSpreadZS}$$

- ▶ But SVM with Radial Basis Function let us access non linear relationship and better identify winning pairs



- ▶ Current SVM ranking (as of 15/04/19):

Long	Short	SVM rank	1Y vol spread	Realized PnL	Implied SpreadZS
RTY Index	SPX Index	1	1,51	2,26	-2,05
USDKRW	USDTWD	2	2,49	1,19	-2,31

# Support Vector Machine extended to triangles and dispersion

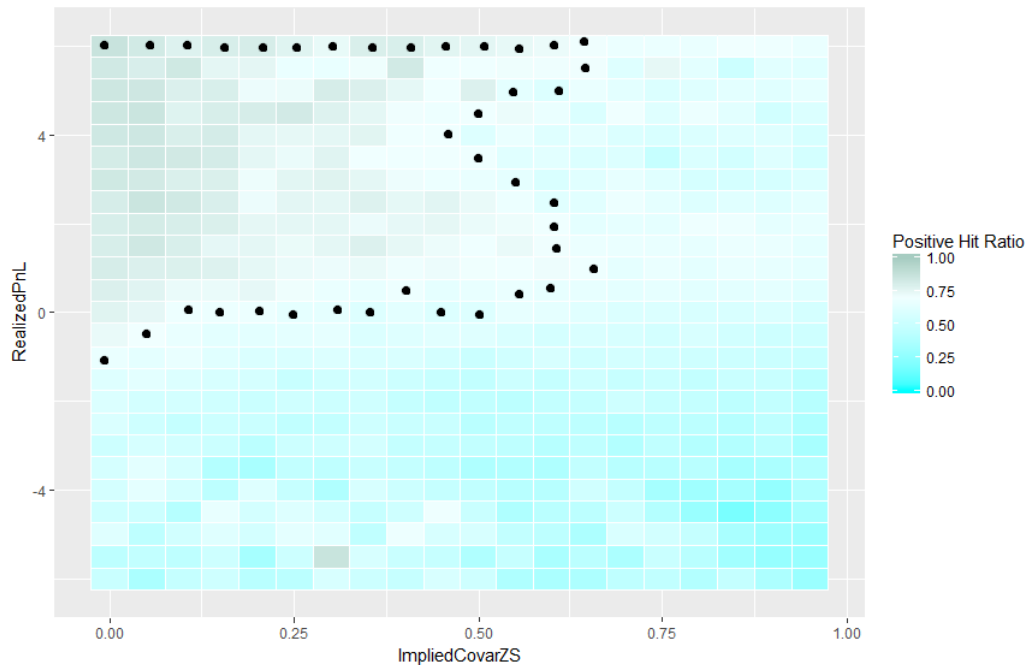
► RV Vol not limited to pairs :

- Var triangles to extract covariance RV trades

$$Var(\ln(X * Y)) = Var(\ln(X)) + Var(\ln(Y)) + 2 * CoVar(\ln(X), \ln(Y))$$

$$s.t. CoVar(\ln(X), \ln(Y)) = \frac{Var(\ln(X*Y)) - Var(\ln(X)) - Var(\ln(Y))}{2}$$

- We use EWMAcovar and ImpliedCoVarZS to build triangle SVM



Leg compo	Leg Index	Leg FX	SVM rank	Realized PnL	ImpliedCoVar ZS
EWY US	KOSPI2	USDKRW	1	1,98	-1,45
UKX in USD	UKX	GBPUSD	2	0,21	-1,80

Short Index	Long Stock	SVM rank	1Y vol spread	Realized PnL	ImpliedSpread ZS
SPX Index	NVDA US Equity	1	21,91	19,11	-0,68
SPX Index	AAPL US Equity	2	8,16	7,20	-0,59

- It can also be generalized to build bespoke dispersion

# Support Vector Machine outperformance & enhancements

- ▶ SVM helps to increase metrics of RV Vol strategies

	Exane Integrale RV Vol w/o SVM	Exane Integrale RV Vol <i>with</i> SVM
Return	8,05	9,15
Sdev	5	5
<b>SR</b>	<b>1,61</b>	<b>1,83</b>
MDD	4,97	4,71
MDD/Sdev	<b>0,99</b>	<b>0,94</b>

- ▶ Ideas to improve this simple SVM

- Include more explicative variable like CDS, leverage effect...
- Address mean reversion behavior of the spread
- Add a crucial overview of volatility positioning and flows

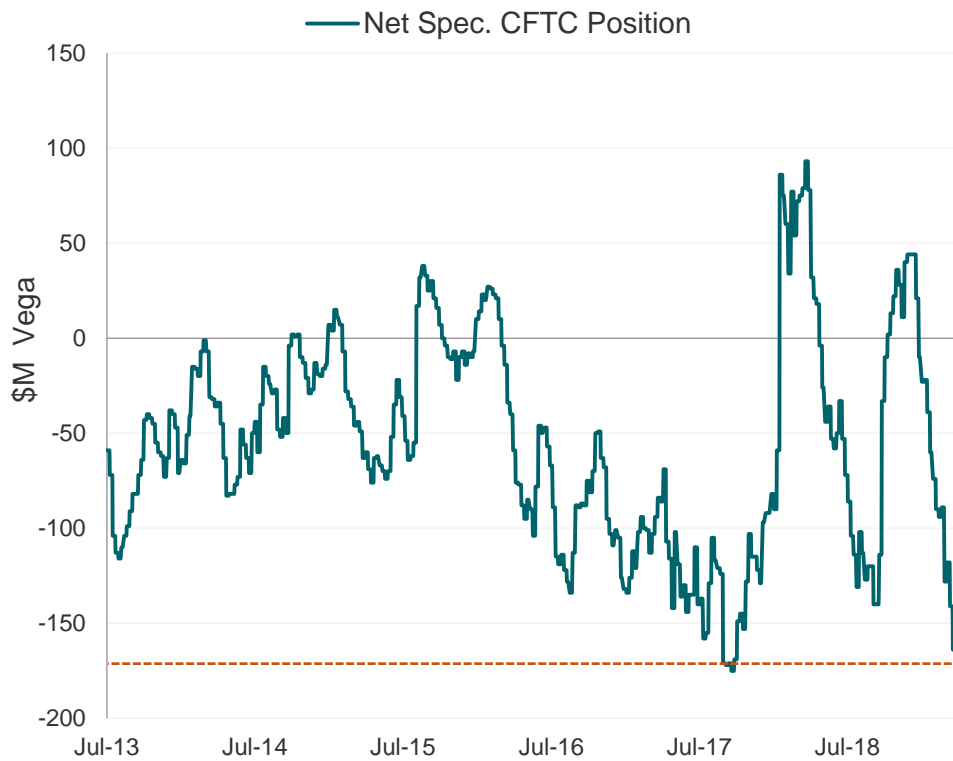
# Conclusion

- ▶ Volatility investing does not mean obviously selling
- ▶ Harvesting Volatility Risk Premium suffers drawbacks and is still very **crowded**
- ▶ Other valuable strategies like **RV Vol** let construct **stronger risk/reward** profiles
- ▶ These strategies **perform particularly well in Risk-Off markets**
- ▶ **SVM** is a useful tool to systematize selection of RV Vol trades
- ▶ Now more than ever **flows and positioning are key** to navigate Vol investing

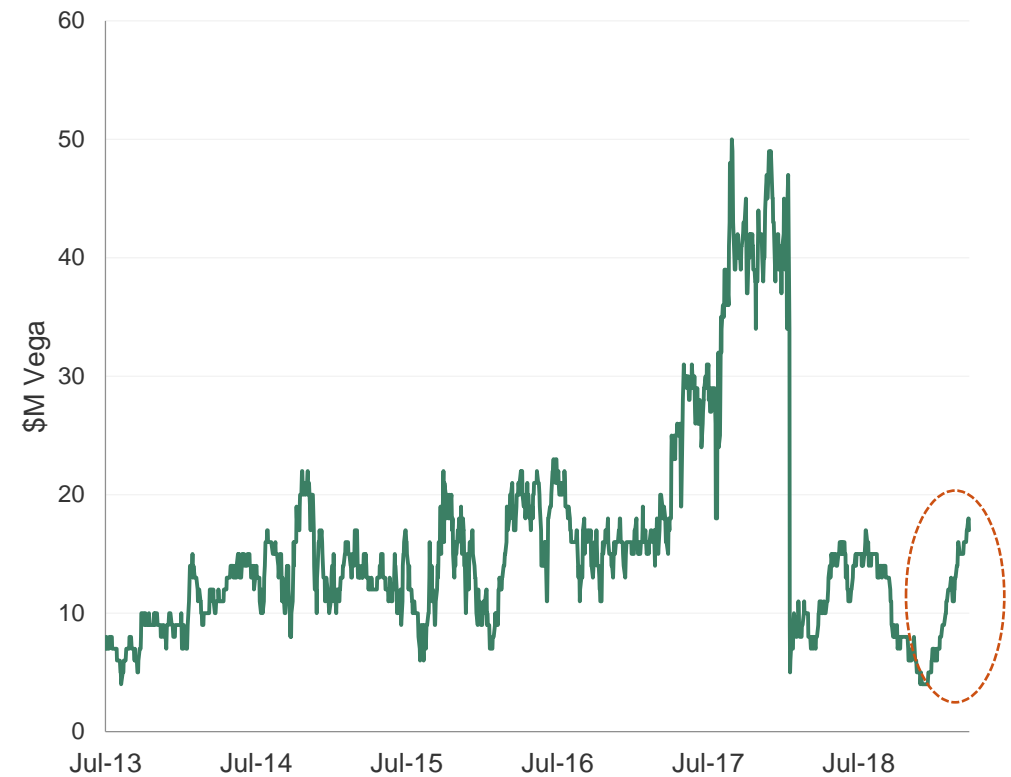
# Bonus: today's count of naked tourists on the beach

► On our way to eternal return?

OVERCROWDING ON SHORT VIX BACK TO EXTREME



REB. ETP/N SHORT/LEVERAGED FOR 1 PT MOVE REBUILDING



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