

Market Internal Weekly

Top 3 Q&A on Risk Parity & Retail Investors Post Conference Calls

Executive Summary

Over 400 clients dialed in to my conference calls on "Market Internal Update: Bearish Bonds, Bullish Equities: Special Focus on Systematic Funds, Retail Investors and Sectors" this week. If you want to listen to replay (until next Tues for US Call and for 14 days for APAC Call), get a copy of the presentation or read our summary, please contact your UBS sales. Below are a few follow-up analysis based on the three popular questions during and post calls.

Question #1: How far along do you think risk parity unwind is?

This is the million dollar question that everyone wonders. While I don't have a crystal ball, this is my best estimate. Risk parity rebalance depends heavily on cross-asset correlation, which is a moving factor itself. Therefore, final rebalancing can be broken into two segments: 1) How much rebalancing is needed based on current correlation and initial exposure? 2) If 2M correl rises or stays positive longer, 1Y correl will rise further and will cause more unwind.

On 2/25, equity/10Y bond 2M correl turned positive @ +20% and has since risen to +26% the last 3 days (Chart 1). 1Y correl rose from -43% in mid Feb to the current -35% - a sharp rise for a 1Y statistic. Based on UBS RP model and regression vs listed RP fund returns, we estimate that typical RP bond exposure was ~140-160% or 70-90%-tile vs 3Y prior to unwind. In addition, UBS RP model projects a quarter reduction in bond exposures on the back of recent correl & vol spikes, which is equivalent to 35-40% in \$ exposure or \$210-240 bil using \$600 bil AUM estimate.

Since risk parity funds have trading flexibility, they are more likely to spread out residual selling opportunistically post initial unwind, instead of back-to-back selling. Excluding 2/26 (pensions bond buying rebalance), treasury futures excess sell flow since 2/25 is @ \$91 bil. We typically assume ~25-35% of excess flow (based on listed products) is truly directional but given listed flow is only a fraction of OTC bond flow, we estimate rebalancing could be in the range of \$80-100 bil or around 40% of the estimated selling needed. Using another approach which is based on the last 3 similar correl & rate environment, TLT -7.4%, -11.0% and -13.8% respectively at an average of -10.7% (Charts 3 & 4). After excluding the +3% pension buying related rally on 2/26, TLT would have been down -2.5%, roughly 25% of the target move of -10%. Hence, we **estimate RP rebalancing could be in the range of 25%-40% done based on current rebalancing need. However, if correl rises further or stays positive longer, rebalancing estimate will rise accordingly.**

Question #2: What is your target treasury yield?

Since the current correlation and rates are the most similar to Sep 2016, we use treasury moves at the time as a reference where TY1 - 5.9% (10Y rate rises from 1.67% to 2.59%), US1 -11.5% (20Y rate rises from 2.05% to 2.91%) and WN1 -13.7% (30Y rate rises from 2.39% to 3.17%) in 2016Q4. The major difference of the current market conditions vs Sep 2016 is that treasury bonds have already been weak fundamentally for 6 months prior vs only 2 months then. Therefore, using 2016Q4 moves as reference, **our top-end targets are 10Y @ 2.43%, 20Y & 30Y @ 2.93% (Table 2). At half the moves, low-end targets are 10Y @ 1.86%, 20Y @ 2.42% and 30Y @ 2.47% vs current @ 1.51%, 2.18% and 2.27% respectively.**

Question #3: Your medium-term bullish view is based on a mix of RP shifting from portfolio unwind to asset allocation as well as retail investors continuing to support equities. Are you concerned that retail investors are creating a bubble?

First, I encourage you to listen to my call or at least read the summary on Retail influence to the financial market. The current structural migration from mutual fund assets to retail stock investment has created some permanent changes as well as new phenomena that are worth to consider when managing portfolios. Retail investors' increase in leverage and narrow focus in stock selection is expected to continue to drive extreme valuation in popular names, which will eventually create a bubble. However, **based on the several metrics we track (below & more), we are not close to bursting it at all.** We will continue to monitor these metrics as well as other market internal factors to detect any early sign of problem as it arises.

- 1) **Intraday Recovery Score (Risk Appetite Proxy) (Table 5):** As discussed in EQ derivatives conference last October, major drawdown drivers can be broadly classified as slow developing internal problems and unprecedented external shocks. Since 2000, S&P 500 were down over 15% eight times, of which six times were driven by slow developing problems such as tech bubble and recession and two times were triggered by unprecedented events such as US debt downgrade and Covid-19. In general, slow problems took the market longer time to correct and also longer time to recover, while unprecedented events shocked the market faster followed by sharp recovery.

In our back test, intraday recovery score was able to detect risk appetite collapse early on to capture about 93% of the drawdown moves in those six slow developing cases, of which signal turned bearish prior to drawdown three times and in early part of drawdown the other three times (Table 5). Currently, intraday recovery score which is a proxy for risk appetite is in the 15-25% range and far from the bearish trigger of -5%

- 2) **Margin (Leverage Proxy) (Charts 6 & 7):** Using debit balances in margin accounts vs S&P 500 market cap as a proxy for market leverage, tech bubble in 2000 and financial crisis in 2008 shared similar leverage risks leading up to the sell-offs (Chart 6). In both

cases, there was sharp margin increase in a short period of time that made the market unstable and vulnerable. Between **Jan 1999 and Feb 2000**, margin rose by **1.02%** from 1.42% to 2.45% in 14 months, before **SPX fell 49%** during tech bubble between **Mar 2000 and Oct 2002**. Between **Sep 2006 and Jul 2007**, margin rose by **1.07%** from 2.08% to 3.15% in 11 months, followed by twin peaks in Feb 2008 (+1.09%) and **Sep 2008 (+1.20%)**. First round of financial crisis sell-off was **-17% between Oct 2007 and Aug 2008**, then another **-48% between Sep 2008 and Mar 2009** at a total of -57%.

Although recent margin increase was sharp, it has only risen by **0.45%** since Jan 2020 low, less than half the pace vs the last two crisis. In addition, **current margin of 2.59%** is towards the low end of **prior 10-year range of 2.51% and 3.11%** (average @ 2.83%) between 2009 and 2018. Notice that margin increase prior to financial crisis coincided with hedge fund industry growth from 3.5% of S&P 500 market cap in 1998 to a peak of 17.3% in 2008 in 10 years (Chart 7). This time around, stock ownership migration from mutual funds to retail investors directly has also triggered margin increase as mutual funds are typically non-levered while retail investors could deploy leverages even though not as high as hedge funds (hence half the pace of margin increase vs the 2006-2007 rise). Also note that we are only in the 2nd year of this stock ownership migration with equity and hybrid mutual fund assets still high at 43% of S&P 500 market cap (vs 51% five years ago).

- 3) **Positive Call Skew + Intraday Recovery Score (Short Term Leverage vs Conviction Proxy)** (Charts 8 – 10): Since mid-Nov 2020, top 50 stocks in SPX have started to exhibit an unusual positive call skew behavior where upside call option volatility is above at-the-money volatility. This phenomenon also coincided with record ETF inflows since Nov. By Feb this year, call skew got even more extreme with at least 75% of the top 50 names having positive 1M call skew at an average of at least 5% of at-the-money IV. This rare situation is likely driven by large retail demand for upside call options. Since 2014, there were 5 similar periods where at least 75% of top stocks had positive call skew at an average of over 5% of IV. They were 6/10-9/23/14, 11/21-12/8/14, 6/11-6/25/15, 2/16-3/21/17 and 1/12-2/2/18 (Chart 8).

We further separate these two groups into high conviction buying vs low conviction buying periods based on intraday recovery scores at the time. When intraday recovery score was over 25% (bullish) on 6/10/14 and 2/16/17 (Chart 9), SPX rose +5-6% in the next 5 months with occasional swings when recovery score turned less supportive (but not bearish). However, when intraday recovery score didn't start off strong (<25%) and dropped below -5% (bearish), SPX sold off between 4% to 11% within the first 1-3 months, then rallied all the way back (Chart 10). **Based on the recent positive call skew and strong intraday recovery score, retail investors have high conviction via upside call implementation and their "buy-the-dip" trading behavior, which is more similar to June 2014 and Feb 2017, when SPX was biased on the upside in the next few months.**

- 4) **Retail Trend-Following Flow (Risk Appetite Proxy)** (Chart 11): Retail flow is usually very sticky and rarely flip flops. Therefore, we have developed a trend following technique to identify the strength of support or lack of support by retail investors, and its inflection point. Since early January, UBS RMM equity flow has been on a persistent up trend from <0.5x standard deviation in early Jan, to >1x in mid Jan, >1.5x in late Jan, >2.5x in mid Feb to >3.0 in late Feb and has hovered around 2.5-3.0x so far in Mar. This suggests **current retail risk appetite is strong.**

Chart 1

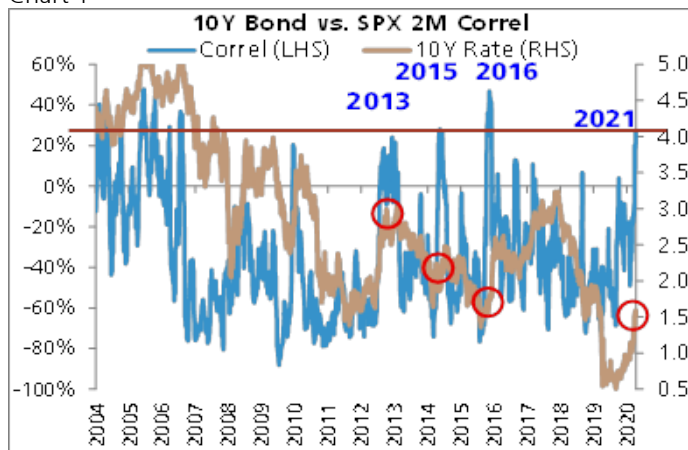


Chart 3

Table 2

Start Date	2/26/21					
Futures Ticker	TY	Target Mov	-6%	Comparison Start Date	9/9/16	
Yield Ticker	USGG10YR			Comparison End Date	12/16/16	
	Comparison					
	2/26	Current	Scenario	9/9/16	12/16/16	Chg
TYA Comdty	132.72	132.56	124.76	131.31	123.61	-5.9%
T 2.75 02/15/28	111.05	110.53	104.38			
Cash Yield	1.09	1.16	2.07			
Yield Change			0.90			
USGG10YR	1.40	1.52	2.43	1.67	2.59	0.92
Spread	0.31	0.36				

Chart 4

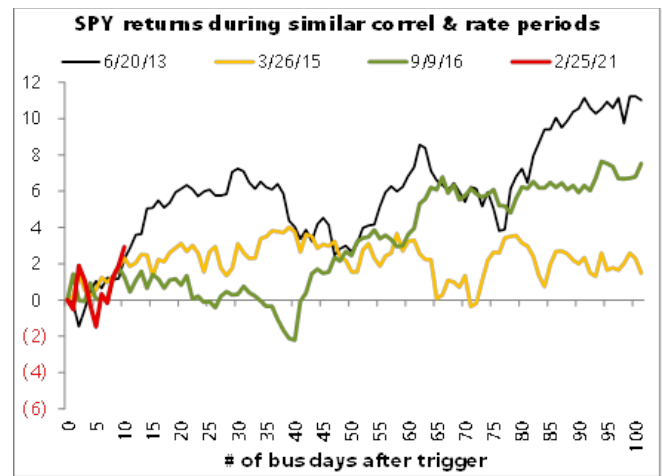
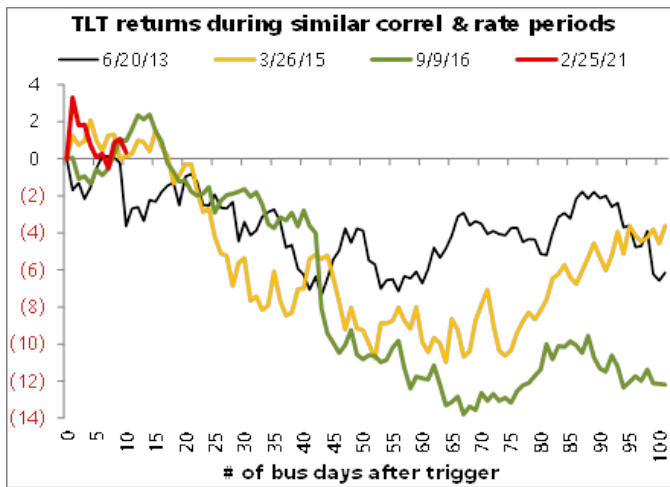


Table 5

Drawdown of at least 15% (since 2000) when recovery score was bearish							Average
Start Date (t)	9/1/00	5/21/01	3/19/02	10/9/07	5/19/08	9/20/18	
SPX Drawdown	-27%	-26%	-34%	-19%	-53%	-20%	-30%
# of Days	215	123	204	153	294	95	181
# of Days to recover	2021	1393	456	1477	710	109	1028
Market Signal							
Intraday Recovery Score (t)	-20%	13%	-9%	-1%	-2%	10%	
Signal Before Drawdown	Bearish	Neutral	Bearish	Bearish	Neutral	Neutral	
Signal Turned Bearish on	7/6/00	6/25/01	3/11/02	8/14/07	6/17/08	10/10/18	
Drawdown after Bearish	-27%	-21%	-34%	-19%	-50%	-16%	-28%
% of Drawdown captured	100%	81%	100%	100%	94%	80%	93%

Chart 6

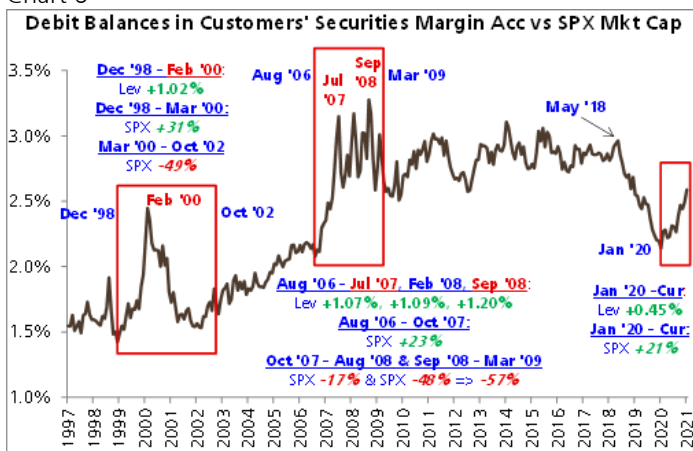


Chart 7

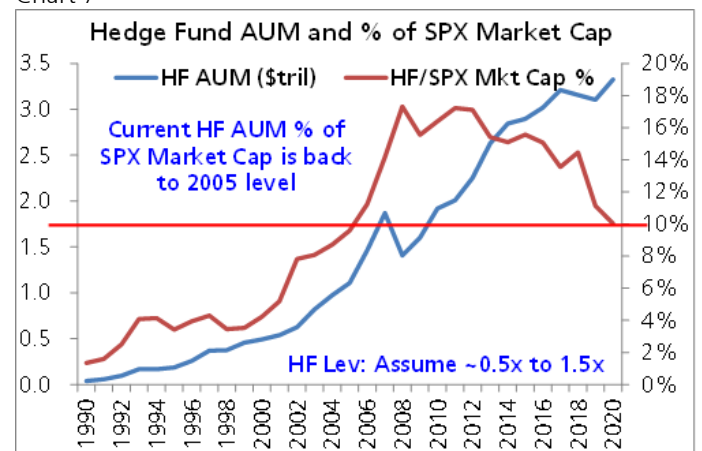


Chart 8

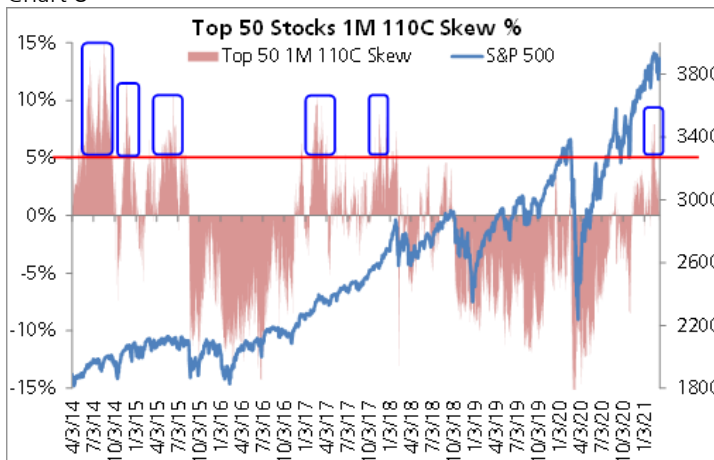


Chart 9

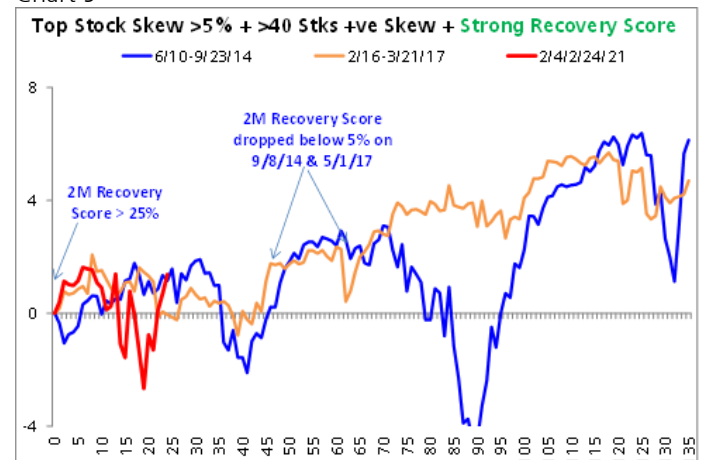


Chart 10

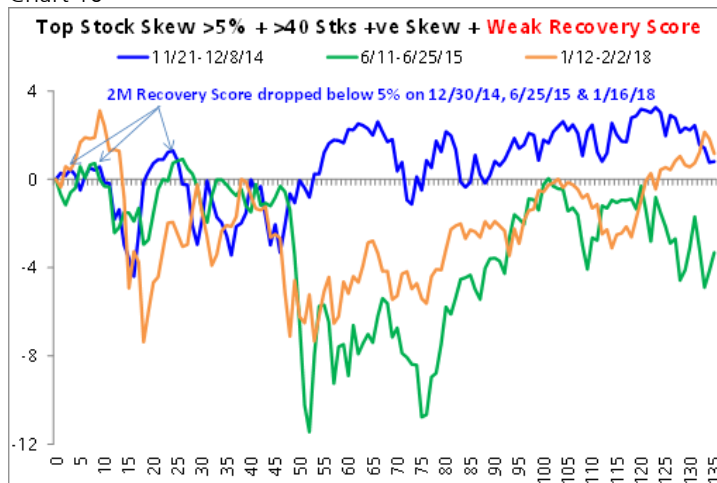
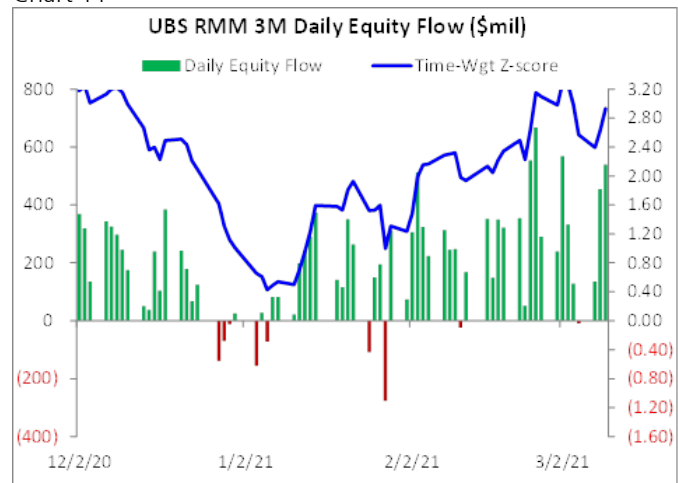


Chart 11



Model Overview

Market Internal Dynamic model has improved over the last week in excess flow (market signal pillar), risk control, CTA, put underwriting and call overwriting (systematic/rule-based rebalancing pillar) and ETF short interest (positioning & flow pillar), while intraday recovery score (market signal pillar), corporate buyback and stock option hedges (positioning & flow pillar) have worsened.

Within **market signals**, intraday recovery scores have fallen but remain medium-term bullish with 4M score @ 26%. Since 3/5, US equity excess flow has switched to moderate buying vs small selling in treasury flows in 4 of last 5 days.

Within **systematic/rule-based rebalancing**, Risk Control, Risk Parity and CTA equity exposures at 42%-tile, 26%-tile and 71%-tile vs 3Y. Risk Control daily breakeven @ 1.15%. If SPX moves +/-3%, 2%, 1.5%, 1% and 50 bps for 1 day, expect to cut \$40-55 bil, \$15-20 bil, \$5-10 bil, no change and add \$5-10 bil respectively. For CTA funds, close triggers have all switched to the buy side with 2 triggers @ 3965.6 (+0.6%) and 3974.6(+0.8%) for ES1, and 3 triggers @ 13134.5 (+0.4%), 13145.5 (+0.5%) and 13301.9 (+1.7%) for NQ1. Given rising positive cross-asset correlation, sample RP funds 1M RV are currently high @ ~12-15% range. Therefore, we expect risk parity and multi-asset funds continue to be under pressure to cut bonds with a mix of buy/sell flows in equities (portfolio unwind vs asset allocation). In terms of put underwriters and call overwriters, recent rally have put their options slightly out-of-the-money vs the last roll period, hence we don't expect much rolling pressure from them. Lastly, although it is too early to predict pension rebalancing flow, we have got many incoming questions due to its quarter-end timing. Currently, we estimate ~\$77 bil of global equity selling, or 24 bps of S&P 500 market cap. US large cap is expected to make up 50% of the sell flow, followed up 35% in US small cap. This \$77 bil magnitude is at 71%-tile vs last 3Y range – high but not extreme. Estimate will change based on cross-asset returns until month-end.

Within **flow/positioning**, high ETF short interest, low CFTC leveraged fund exposures, low MF outflow vs high ETF inflow and UBS RMM buying strength are all positive for the market. However, falling stock option hedges and the anticipated drop in corporate buyback in 2 weeks will slightly offset these bullish factors.



Model Details

Market Signals

- 1) **Intraday Recovery Score** (Figure 1) – 2M & 4M intraday recovery scores have dropped to 15% and 26% respectively
- 2) **Excess Flow** (Figures 2 & 3) – US Equity excess sell flow slowed down gradually between Feb 25 and Mar 4 on the back of expected pensions month-end rebalance and risk parity unwind. Since 3/5, excess flow has switched to moderate buying in 4 of last 5 days at a total of \$49 bil to buy. On the other hand, treasury excess flow was small selling in 4 of last 5 days at a total of \$44 bil to sell once pension month-end related buying was over

Systematic/Rule-based Rebalancing

- 1) **Risk Control** (Figure 4) – S&P 500 10% Risk Control fund leverage cut to 55% or 42%-tile vs 3Y. Daily breakeven is @ 1.15%. Scenario rebalancing:
 - 1-day move: If SPX moves +/-3%, 2%, 1.5%, 1% and 50 bps, expect to cut \$40-55 bil, \$15-20 bil, \$5-10 bil, no change and add \$5-10 bil respectively
 - 2-day moves: If SPX moves +/-3%, 2%, 1.5%, 1% and 50 bps for two days, expect to cut \$65-90 bil, \$30-40 bil, \$10-15 bil, add \$5-10 bil and \$15-20 bil respectively
- 2) **Risk Parity** (Figure 5) – Estimated RP equity exposure @ 20% or 26%-tile vs 3Y, and bond exposure @ 120% or 37%-tile vs 3Y (assumes post rebalancing). UBS RP model is down ~4% since its recent peak on 2/11, with current 1M & 2M RV @ ~8-9% -

- slightly above 7.5% volatility target. However, sample RP funds 1M RV is significantly higher @ ~12-15% - large pressure to cut
- 3) **Cross-Asset Returns/Correl/Volatility** (Figures 6, 8) – Eq/bond 2M correlation both turned positive two weeks ago and remain positive @ 26% respectively. Based on the 15 assets in the UBS Risk Parity model, there were concentrated (9+) cross-asset drawdowns in 9 of 15 days between 2/16 and 3/8. Although many assets have rallied over the last 3 days, cross asset correlation remained high with 13 or 14 assets in our 15-asset model that were up every day. This should put more pressure on bonds' failing ability to hedge portfolio risk
 - 4) **CTA** (Figures 7, 9 - 15) – UBS CTA Equity Proxy has cut again this week to 40% or 71%-tile vs 3Y. For ES1 there are two close buy triggers: MT @ 3965.6 (+0.6%) and ST @ 3974.6(+0.8%). For NQ1 there are 3 close buy triggers: ST @ 13134.5 (+0.4%), MT @ 13145.5 (+0.5%) and LT @ 13301.9 (+1.7%). For RTY1 there is only one close buy trigger MT@ 2363.1 (+0.8%)
 - 5) **Call Overwriters/ Put Underwriters** – With SPX flat to +1% vs last roll period in Feb, we expect option rolling pressure to be relatively small for call overwriters & put underwriters
 - 6) **Pensions Rebalancing** (Figure 16) – As of 3/11 close, March quarter-end rebalancing is currently estimated at \$77 bil of global equity selling, or 24 bps of S&P 500 market cap. US large cap is expected to make up 50% of the sell flow, followed up 35% in US small cap. This \$77 bil magnitude is at 71%-tile vs last 3Y range. Estimate will change based on cross-asset returns until month-end
 - 7) **Option Gamma Risk Proxy using OI %** (Figures 17 - 22) – Stock option gamma has increased again this week; SPY, QQQ and IWM OI @ 31%-tile, 99%-tile and 84%-tile vs 3Y. S&P 500, Nasdaq 100 and Russell 2000 Top stock open OI have all remained the same @ 54%, 76% and 79%-tile vs 3Y
 - 8) **Leveraged & Inverse ETP Rebalancing Sensitivity** (Figures 23 & 24) – ETP rebalancing sensitivity still remains high at \$2.56 bil per 1% asset move, or 0.0075% of S&P 500 Market Cap. This sensitivity ratio is at 80%-tile vs 3Y history

Positioning & Flow

- 1) **Cash Level** (Figures 25 & 26) – Since cash level hit a low of \$4.29 trillion on 12/16/20, investors have added cash 8 of last 11 weeks at a total of +\$73.8 bil, mainly led by institutional investors. On the other hand, retail investors put money to work again 6 of the last 7 weeks @ \$30 bil – current exposure remains close to 10Y low @ 4.8% of S&P 500 market cap
- 2) **UBS PB L/S Exposures** (Figures 27 & 28) – UBS PB L/S clients have cut about 3% of exposures last week, bringing net exposure change since Jan 2020 @ +12% incorporating asset return vs -8% implied trading (excludes return)
- 3) **Stock & ETF Short Interest** (Figures 29 - 31) – As of 3/4, both S&P 500 and Russell 2000 stock short interest continue to be very low @ 4%-tile vs 3Y and new low respectively. As of 2/26 official data, ETF short interest % for SPY, QQQ and IWM all rose to high levels @ 89%, 93% and 86%-tile vs 3Y from 68%, 35% and 90%-tile vs 3Y on 2/12.
- 4) **CFTC Leveraged Fund Exposures** (Figures 32 - 34) – As of 3/2, CFTC leveraged fund exposure has risen decently in S&P 500, now @ 68%-tile vs 3Y. Exposures are very low in Nasdaq and Russell futures @ 10%-tile and 0%-tile vs 3Y
- 5) **VIX Exposure + Option Open Interest** (Figures 36 - 42) – VIX net vega exposure has dropped further to \$13 mil or 42%-tile vs 3Y (from \$30 mil or 64%-tile vs 3Y last week). ETF Put/Call ratios @ 19%-tile, 81%-tile and 60%-tile vs 3Y for SPY, QQQ and IWM respectively. S&P 500, Nasdaq and Russell 2000 top stock P/C ratios unchanged @ 16%-tile, 8%-tile and 5%-tile vs 3Y
- 6) **US MF + ETF Flows** (Figures 43 & 44) – Unofficial data for Feb 2021 shows MF outflows significantly less than recent months @ \$31 bil vs Equity ETF inflows much higher than recent months @ \$73 bil. So far for March, MF outflows @ 8 bil and ETF inflows @ 6 bil.
- 7) **UBS RMM Flow** (Figures 45 - 47) – **Bought equities for the last 25 out of 27 days and sold fixed income 5 out of the last 10 days.** Equity exponentially time-weighted flow remains strong @ 2.9x std dev pace globally, while fixed income flow has decreased steadily to only 0.35x
- 8) **Corporate Buyback** (Figure 48) – Corporate Buyback (Corporate Payment minus Dividend forecast) is estimated @ \$20-25 bil this week and next week. It then starts to decrease to \$15 bil for the last week of March.

Figure 1: S&P 500 Intraday Recovery Scores

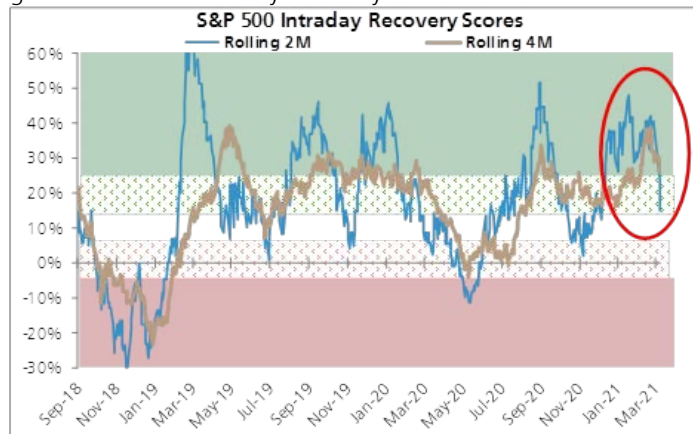


Figure 2: Recent US Equity Daily Excess Flow

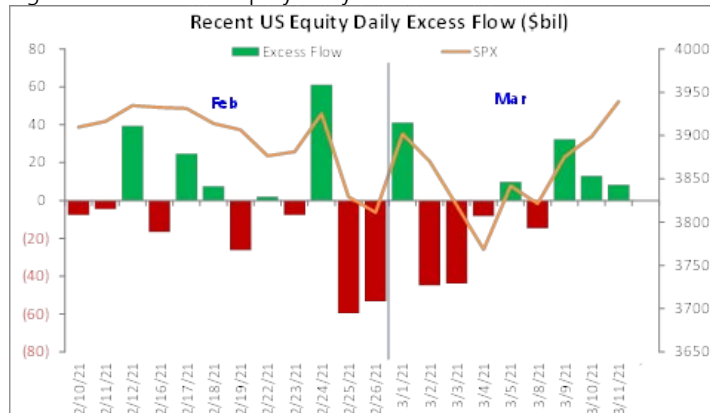


Figure 3: Recent US Treasury Daily Excess Flow

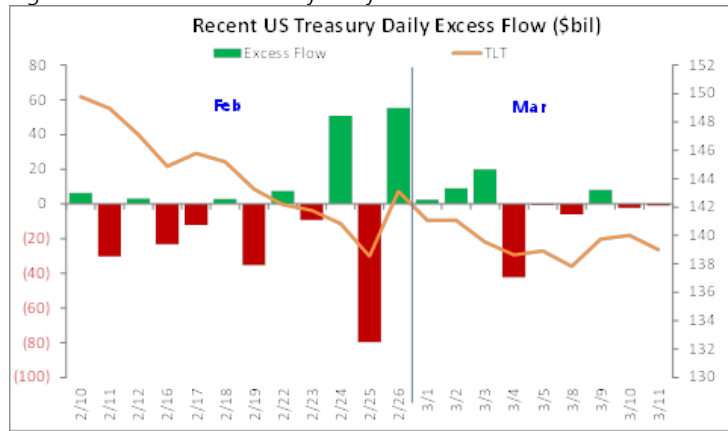


Figure 4: SPX Risk Control Leverage & Scenario Changes

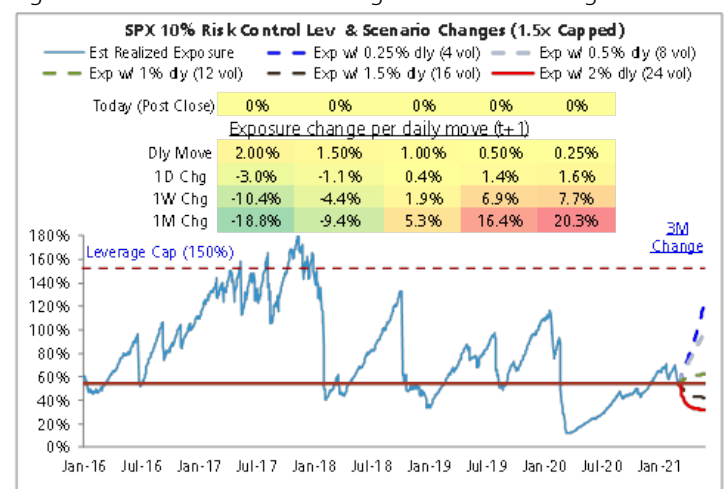


Figure 5: UBS Risk Parity Bond & Equity Model Exposures

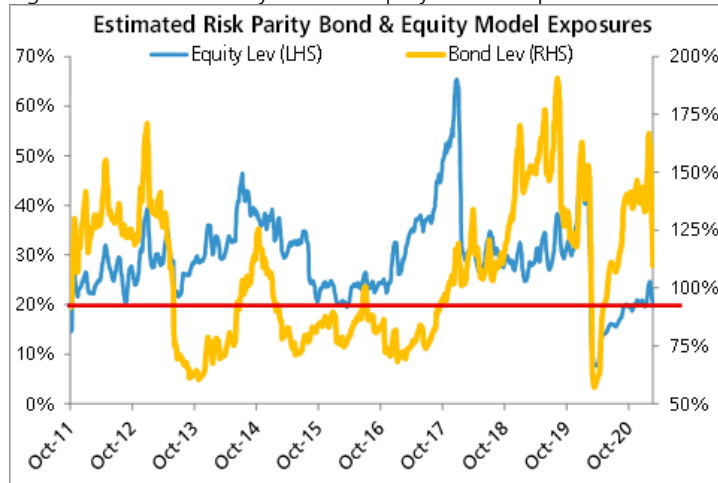


Figure 6: 10Y Bond vs SPX 2M Correl

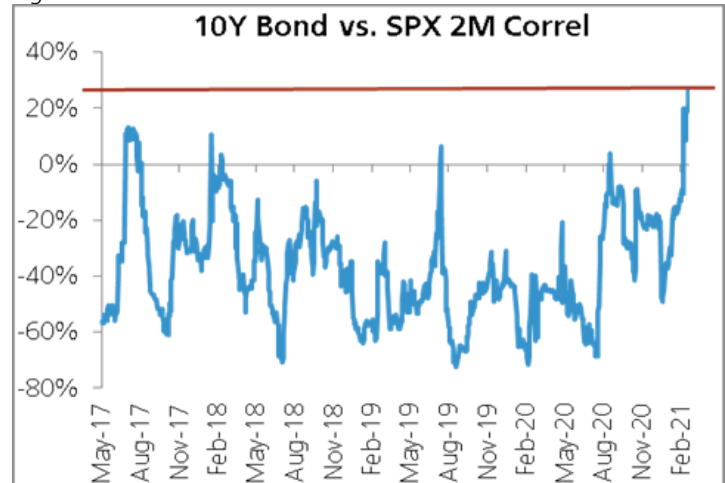


Figure 7: UBS CTA Model Equity Daily Proxy

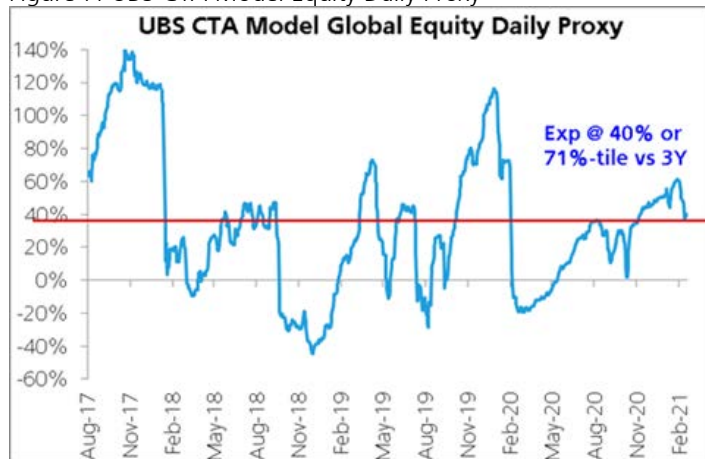


Figure 8: Cross-Asset Drawdown

End Date	Total #		UBS Risk Parity Assets															
			Equities			Gov't Bonds				Commodities / Inflation-Linked				Credit / Carry				
	Assets Down	Median Ret	S&P 500	MSCI EAFE	MSCI EM	US Treasury	Euro Bund	Japan JGB	EM Sov	US Inflat'n	BBG Agri	BBG Energy	BBG Metals	EM FX	Inv Gr Bonds	HYG	EM Corp Bonds	
2/16/21	11	-0.23%	-0.06%	1.31%	0.93%	-0.72%	-0.66%	-0.12%	-0.87%	-0.40%	1.75%	2.01%	-0.23%	-0.27%	-0.57%	-0.16%	-0.28%	
2/17/21	8	-0.03%	-0.03%	-1.03%	0.19%	0.09%	0.14%	-0.18%	-0.26%	-0.05%	-0.32%	1.40%	-0.48%	0.03%	0.22%	-0.03%	0.36%	
2/18/21	10	-0.11%	-0.44%	-0.52%	-1.37%	-0.01%	-0.20%	0.05%	0.14%	-0.41%	0.30%	-0.88%	0.78%	-0.07%	0.09%	-0.14%	-0.11%	
2/19/21	10	-0.19%	-0.19%	0.47%	0.34%	-0.42%	-0.29%	-0.09%	-0.28%	-0.45%	-0.04%	-0.82%	1.15%	0.12%	-0.55%	0.01%	-0.23%	
2/22/21	9	-0.14%	-0.77%	0.05%	-2.26%	-0.14%	0.31%	-0.12%	-0.72%	0.06%	1.36%	1.98%	1.59%	-0.24%	-0.56%	-0.31%	-0.49%	
2/23/21	5	0.03%	0.13%	0.03%	0.04%	0.07%	-0.21%	0.00%	-0.13%	0.03%	0.48%	-0.41%	-0.40%	0.16%	-0.36%	0.24%	0.32%	
2/24/21	7	0.01%	1.14%	-0.74%	-1.53%	-0.14%	-0.18%	0.01%	-0.01%	-0.10%	1.31%	1.26%	0.79%	0.19%	-0.08%	0.10%	0.09%	
2/25/21	13	-0.93%	-2.45%	0.71%	0.51%	-1.36%	-0.56%	-0.17%	-0.74%	-1.21%	-0.98%	-0.03%	-0.53%	-1.84%	-0.93%	-0.95%	-0.95%	
2/26/21	10	-0.35%	-0.48%	-2.90%	-3.22%	0.96%	0.20%	-0.19%	-0.35%	1.24%	-1.09%	-1.98%	-3.38%	-0.38%	0.65%	-0.30%	0.54%	
3/1/21	5	0.14%	2.38%	1.37%	1.73%	-0.19%	0.67%	0.13%	0.47%	-0.25%	-0.95%	-0.77%	0.03%	0.14%	0.20%	0.76%	-0.24%	
3/2/21	5	0.07%	-0.81%	0.03%	-0.21%	0.19%	0.07%	0.20%	0.06%	0.36%	0.72%	-0.48%	1.45%	0.14%	0.19%	-0.15%	-0.03%	
3/3/21	11	-0.31%	-1.31%	0.28%	1.35%	-0.53%	-0.42%	0.05%	-0.31%	-0.23%	-0.74%	1.22%	-1.82%	-0.29%	-0.57%	-0.32%	-0.31%	
3/4/21	13	-0.39%	-1.34%	-0.90%	-2.30%	-0.52%	0.19%	-0.12%	-0.36%	-0.39%	-0.17%	2.27%	-2.51%	-0.64%	-0.69%	-0.38%	-0.36%	
3/5/21	8	-0.02%	1.95%	-1.37%	-0.52%	-0.14%	-0.16%	0.43%	-0.83%	0.04%	0.86%	2.28%	0.69%	-0.44%	-0.39%	0.30%	-0.02%	
3/8/21	13	-0.54%	-0.54%	0.80%	-2.33%	-0.38%	-0.14%	-0.24%	-0.96%	-0.49%	0.07%	-1.34%	-0.44%	-0.96%	-0.64%	-0.73%	-0.90%	
3/9/21	2	0.47%	1.42%	1.04%	0.74%	0.47%	0.20%	-0.12%	0.34%	0.55%	0.22%	-0.81%	0.77%	0.71%	0.49%	0.14%	0.45%	
3/10/21	1	0.34%	0.60%	0.34%	0.53%	0.22%	0.05%	0.05%	0.47%	0.45%	-0.95%	0.63%	0.12%	1.05%	0.39%	0.31%	0.23%	
3/11/21 *	1	0.76%	1.04%	0.80%	2.47%	-0.03%	0.19%	0.11%	0.77%	0.11%	0.76%	1.67%	0.89%	0.95%	0.03%	0.37%	0.29%	

* Intraday numbers

Figure 9: UBS CTA Tracker Summary

UBS CTA Tracker - % of Common Models being Triggered / Watched

As of 3/11/21

Asset	Spot	Proxy		L				S				BUY Watch			SELL Watch			Dys in LT Mom.			
		Exp +	3Y Rank	% Strat	Today New	Action L	Exit L	% Strat	Today New	Action S	Exit S	% Strat	Next Level	% or # *	% Strat	Next Level	% or # *	L/ 1Y	L/ 1Y	L/ 1Y	L/ 1Y
																		S Mom.	S Mom.	S Mom.	S Mom.
S&P 500	3942	4.6%	62%	67%								17%	3961	0.5%				L 205	L 168		
Russell 2000	2344	3.1%	66%	83%	8%							8%	2356	0.5%				L 87	L 142		
Nasdaq 100	13077	1.6%	30%	42%				25%		8%		25%	13141	0.5%				L 235	L 202		
S&P Midcap	2628	4.0%	67%	92%	8%													L 85	L 143		
Dow Jones	32540	6.2%	74%	92%														L 87	L 148		
Euro STOXX	3842	5.0%	83%	92%														L 14	L 130		
FTSE 100	6723	4.8%	82%	83%								17%	6830	1.6%				L 10	L 69		
DAX	14558	4.9%	86%	92%														L 54	L 160		
Nikkei 225	29190	3.7%	66%	75%				8%				8%	29607	1.4%	8%	MAVG	1	L 195	L 157		
MSCI EAFE	2226	6.3%	88%	75%								17%	2249	1.0%	17%	2179	-2.1%	L 86	L 148		
HSCEI	11453	2.2%	79%	42%				8%				8%	11531	0.7%				L 38	L 70		
Hang Seng	29461	3.5%	88%	58%				8%				17%	29678	0.7%				L 36	L 73		
KOSPI 200	416.4	2.9%	68%	58%						8%								L 182	L 161		
Bovespa	115026	0.9%	33%	33%				25%		17%		8%	117404	2.1%				L 6	L 140		
MSCI EM	1373	1.6%	61%	33%				8%		8%		25%	1383	0.7%				L 174	L 159		
WTI Crude	65.9	3.6%	88%	100%														L 28	L 129		
Brent Crude	69.6	3.7%	88%	100%														L 32	L 109		
Natural Gas	2.68	0.9%	74%	33%				8%										L 112	L 132		
Gold	1726	-3.8%	11%	8%				92%				8%	1760.2	2.0%				L 448	S 14		
Copper	414.1	4.0%	80%	92%														L 175	L 163		
Silver	26.2	1.1%	56%	42%				8%				17%	27	2.3%				L 215	L 173		
EUR	1.199	2.1%	68%	42%				50%		50%		1.204	0.5%		25%	1.183	-1.3%	L 179	L 183		
GBP	1.399	11.7%	98%	83%						8%		1.412	0.9%		17%	1.378	-1.6%	L 110	L 146		
AUD	0.780	7.8%	82%	67%						25%		0.780	0.0%		8%	MAVG	1	L 172	L 181		
JPYUSD	108.7	-8.2%	20%	17%				83%		8%		106.5	-2.0%		17%	110.8	2.0%	L 5	L 228		
CADUSD	1.253	12.3%	81%	92%	17%										33%	1.265	1.0%	L 93	L 154		
US 10Y Bond	133.7	-26.7%	7%					100%		25%		134.8	0.8%					S 9	S 61		
US 20Y Bond	159.4	-13.6%	8%					100%		8%		162.0	1.6%					S 14	S 87		
US 30Y Bond	187.5	-8.9%	10%					100%										S 15	S 73		
Euro BTP 10Y	149.9	-2.1%	22%	25%		8%		58%		50%		150.9	0.6%					L 459	L 161		
Euro Bund 10Y	171.6	-13.6%	5%	8%				83%		17%		174.2	1.5%		17%	171.2	-0.2%	S 15	L 184		
Euro Bund 30Y	208.5	-10.5%	0%					92%										S 15	S 10		
JGB 10Y	151.3	-68.8%	6%					92%		67%		151.6	0.2%					S 28	S 298		
Aussie 3Y	99.77	-39.0%	12%	17%				50%		50%		99.79	0.0%		8%	99.56	-0.2%	L 579	L 667		
Aussie 10Y	98.31	-98.4%	6%					100%		67%		98.42	0.1%					S 37	S 13		

Footnote: * If MA condition is met, then watch spot within 4%, else watch spot within 2%; If Spot condition is met & MA cross-over within 5 days, then show # of days, else N/A

+ Proxy Exposure = 1% vol target Exposure

Figure 10: ES1 CTA Triggers

ES1	3942.25 UBS CTA Tracker				As of 3/11/21					
Signal Method	Current		BUY / SELL Watch							
	Current L/S	# Dys	Buy/Sell B/S	# Dys	Action	Level	Spot* vs Cur	vs Hi-Lo	MA X-over** Action	# Dys
New High / Low ST	L	25	S		Exit	3765.60	-4.5%	-4.3%		
New High / Low MT	L	166								
1Y Momentum LT	L	205	S		Exit	2469.00	-37.4%	-37.3%		
Bollinger Band ST			B	2	Long	3974.64	0.8%	0.7%		
Bollinger Band MT			B	3	Long	3965.62	0.6%	0.5%		
Bollinger Band LT			B		Long	4293.11	8.9%	8.8%		
Bollinger Band ST	L	4	S		Exit	3808.29	-3.4%	-3.2%		
Bollinger Band MT	L	4	S		Exit	3764.87	-4.5%	-4.3%		
Bollinger Band LT	L	87	S		Exit	3697.35	-6.2%	-6.1%		
MA Crossover ST				3						
MA Crossover MT	L	192								
MA Crossover LT	L	168								

Figure 11: NQ1 CTA Triggers

NQ1		13076.5 UBS CTA Tracker				As of 3/11/21			
Signal Method	Current		BUY / SELL Watch						
	Current L/S	# Dys	Buy/Sell B/S	# Dys	Action	Spot*		MA X-over	
						Level	vs Cur	vs Hi-Lo	Action
New High / Low ST	S	6	B		Exit	13804.8	5.6%	5.4%	
New High / Low MT	L	192							
1Y Momentum LT	L	235	S		Exit	7215.3	-44.8%	-44.7%	
Bollinger Band ST	S	13	B	2	Exit	13134.5	0.4%	0.3%	
Bollinger Band MT	S	6	B	2	Exit	13145.5	0.5%	0.4%	
Bollinger Band LT	L	191	S		Exit	11736.7	-10.2%	-10.0%	
Bollinger Band ST	ES	1							
Bollinger Band MT			B	1	Long	13371.2	2.3%	2.1%	
Bollinger Band LT			B	1	Long	13301.9	1.7%	1.6%	
MA Crossover ST				7					
MA Crossover MT	L	213							
MA Crossover LT	L	202							

Figure 12: ES1 CTA Triggers

RTY1	2344.10		UBS CTA Tracker		As of 3/11/21					
Signal Method	Current		BUY / SELL Watch							
	Current	Buy/Sell	Spot*				MA X-over			
	L/S	# Dys	B/S	# Dys	Action	Level	vs Cur	vs Hi-Lo	Action	# Dys
New High / Low ST	L	107	S		Exit	2144.50	-8.5%	-8.2%		
New High / Low MT	L	151								
1Y Momentum LT	L	87	S		Exit	1109.90	-52.7%	-52.5%		
Bollinger Band ST	L	1	S		Exit	2242.63	-4.3%	-4.0%		
Bollinger Band MT			B	1	Long	2363.13	0.8%	0.7%		
Bollinger Band LT			B		Long	2646.76	12.9%	12.8%		
Bollinger Band ST	L	4	S		Exit	2136.23	-8.9%	-8.6%		
Bollinger Band MT	L	88	S		Exit	2062.14	-12.0%	-11.8%		
Bollinger Band LT	L	109	S		Exit	1974.88	-15.8%	-15.5%		
MA Crossover ST	L	83								
MA Crossover MT	L	186								
MA Crossover LT	L	142								

Figure 13: TY1 CTA Triggers

TY1	133.72		UBS CTA Tracker		USGG10YR		1.53		As of 3/11/21 20:49	
Signal Method	Current		BUY / SELL Watch							
	L/S	# Dys	Buy/Sell		Level	Ref Yield	Fut Price vs*		MA X-over	
			B/S	# Dys			Action	Cur		Hi-Lo
New High / Low ST	S	45	B		Exit	136.92	1.16	2.4%	2.1%	
New High / Low MT	S	90								
1Y Momentum LT	S	9	B		Exit	137.33	1.11	2.7%	2.4%	
Bollinger Band ST	S	18	B	17	Exit	134.83	1.40	0.8%	0.5%	
Bollinger Band MT	S	45	B	2	Exit	136.21	1.24	1.9%	1.6%	
Bollinger Band LT	S	45	B		Exit	138.28	1.00	3.4%	3.1%	
Bollinger Band ST	S	54	B	1	Exit	136.54	1.20	2.1%	1.8%	
Bollinger Band MT	S	100	B		Exit	136.96	1.15	2.4%	2.1%	
Bollinger Band LT	S	99	B		Exit	137.26	1.12	2.6%	2.4%	
MA Crossover ST	S	50								
MA Crossover MT	S	87								
MA Crossover LT	S	61								

Figure 14: US1 CTA Triggers

US1	159.44		UBS CTA Tracker		USGG20Y		2.18		As of 3/11/21 20:49	
Signal Method	Current		BUY / SELL Watch							
	L/S	# Dys	Buy/Sell	B/S # Dys	Action	Level	Ref Yield	Fut Price vs* Cur	Hi-Lo	MA X-over Action # Dys
New High / Low ST	S	135	B		Exit	167.84	1.76	5.3%	4.6%	
New High / Low MT	S	109	B							
1Y Momentum LT	S	14	B		Exit	181.56	1.12	13.9%	13.1%	
Bollinger Band ST	S	25	B	3	Exit	162.00	2.05	1.6%	1.0%	
Bollinger Band MT	S	45	B		Exit	166.49	1.82	4.4%	3.8%	
Bollinger Band LT	S	65	B		Exit	173.96	1.46	9.1%	8.4%	
Bollinger Band ST	S	45	B		Exit	167.43	1.78	5.0%	4.3%	
Bollinger Band MT	S	129	B		Exit	168.69	1.71	5.8%	5.1%	
Bollinger Band LT	S	129	B		Exit	169.56	1.67	6.3%	5.7%	
MA Crossover ST	S	43								
MA Crossover MT	S	109								
MA Crossover LT	S	87								

Figure 15: WN1 CTA Triggers

WN1 187.50 UBS CTA Tracker USG30YR 2.28 As of 3/12/21 20:49

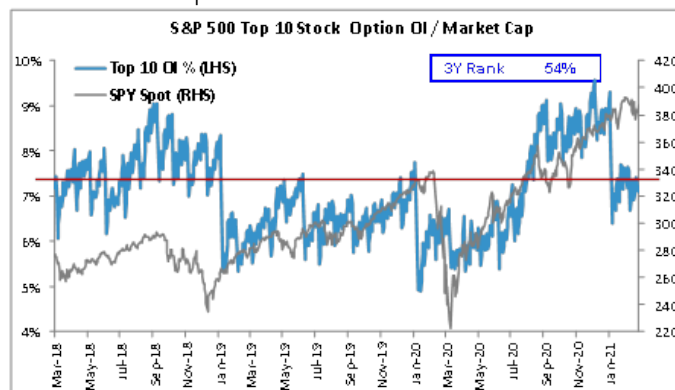
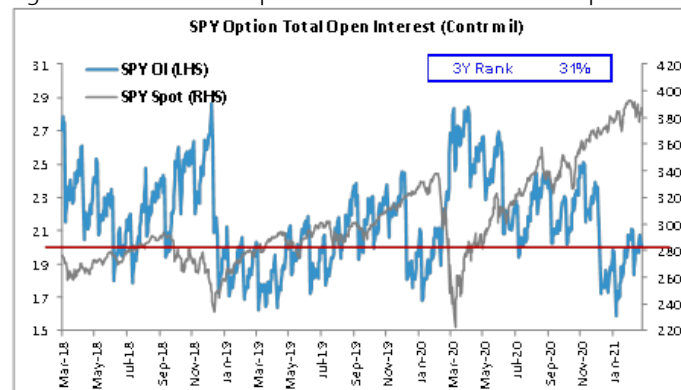
Signal Method	Current		BUY / SELL Watch						MA X-over**
	L/S	# Dys	Buy/Sell	# Dys	Action	Level	Ref Yield	Fut Price vs* Cur Hi-Lo	
New High / Low ST	S	54	B		Exit	202.09	1.88	7.8% 7.8%	
New High / Low MT	S	98							
1Y Momentum LT	S	15			Exit		1.50	16.1% 16.1%	
Bollinger Band ST	S	27	B		Exit	191.64	2.17	2.2% 2.2%	
Bollinger Band MT	S	54	B		Exit	200.19	1.93	6.8% 6.8%	
Bollinger Band LT	S	47	B		Exit	213.83	1.59	14.0% 14.0%	
Bollinger Band ST	S	55	B		Exit	202.40	1.88	7.9% 7.9%	
Bollinger Band MT	S	56	B		Exit	205.65	1.79	9.7% 9.7%	
Bollinger Band LT	S	56	B		Exit	207.63	1.74	10.7% 10.7%	
MA Crossover ST	S	65							
MA Crossover MT	S	97							
MA Crossover LT	S	73							

Figure 16: US Pensions Rebalancing Esimtae

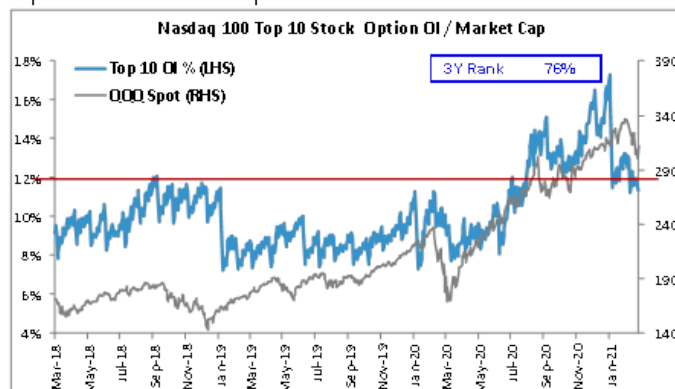
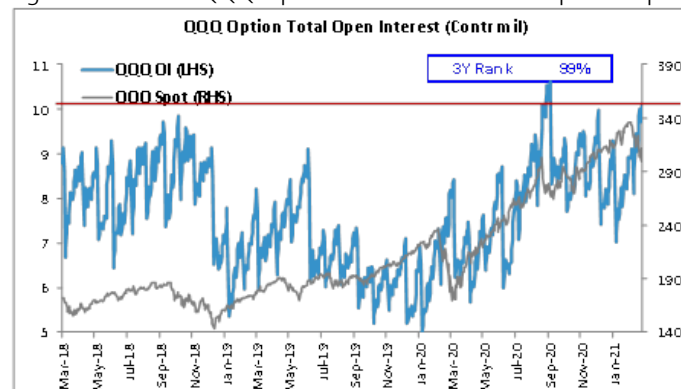
US Pensions Rebalancing Estimate in \$B (as of Mar 11, 21)

US Public Pensions														US Corporate Pensions					
Estimated AUM	\$ 5,168						\$ 3,429												
	US Large	US Small	DM	EM	Bonds	Oth	US Large	US Small	DM	EM	Bonds	Oth							
Target Weight	35%	5%	10%	5%	25%	20%	35%	5%	10%	5%	25%	20%							
Proxy Index	SPX	RTY	EFA	EEM	TLT/AGG		SPX	RTY	EFA	EEM	AGG								
MTD Total Ret	3.4%	6.3%	2.8%	2.3%	-1.7%		3.4%	6.3%	2.8%	2.3%	-0.6%								
QTD Total Ret	5.2%	18.6%	4.3%	6.4%	-7.3%		5.2%	18.6%	4.3%	6.4%	-2.9%								
Pre-rebal Mth Wgt	35.5%	5.2%	10.1%	5.0%	24.1%		35.4%	5.2%	10.1%	5.0%	24.3%								
Pre-rebal Qtr Wgt	36.1%	5.8%	10.2%	5.2%	22.7%		35.6%	5.7%	10.1%	5.1%	23.5%								
Rebal Mth \$	(7.0)	(2.8)	(1.2)	(0.3)	11.4		(3.7)	(1.7)	(0.5)	(0.0)	6.0								
Rebal Qtr \$	(13.9)	(10.6)	(2.8)	(2.8)	30.1		(5.1)	(6.4)	(0.7)	(1.2)	13.5								
Rebalancing \$bil	(20.9)	(13.5)	(4.0)	(3.0)	41.5		(8.8)	(8.2)	(1.2)	(1.3)	19.5								
						(41.5)							(61.0)			(19.5)			
Triggered Rebalancing						GI Eq:	(16.3)	=> ME:						(16.3)	Wkly:	0.0			
TOTAL							(77.2)												

Figures 17 & 18: SPY Option Total OI and S&P 500 Top 10 Stock Option OI / Market Cap



Figures 19 & 20: QQQ Option Total OI and Nasdaq 100 Top 10 Stock Option OI / Market Cap



Figures 21 & 22: IWM Option Total OI and Russell 2000 Top 30 Stock Option OI / Market Cap

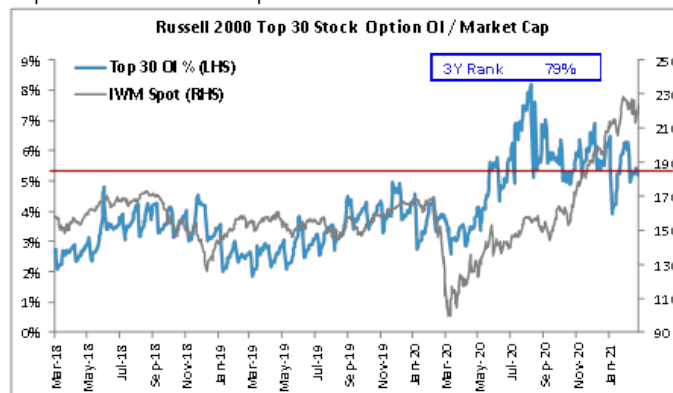
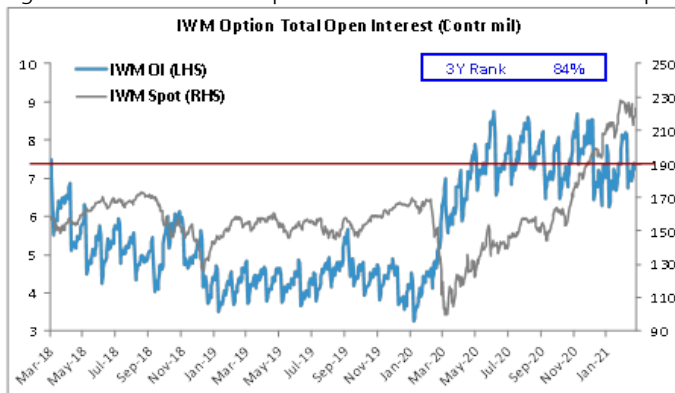


Figure 23: US Equity ETF Rebalancing per 1% ETF move

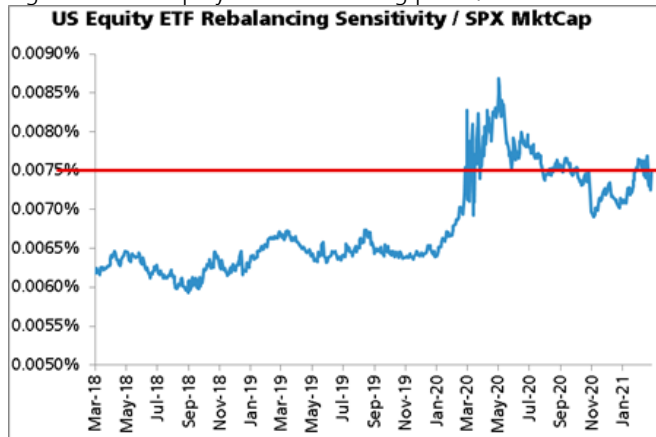


Figure 24: US Equity ETF Rebalancing Sensitivity / SPX Index

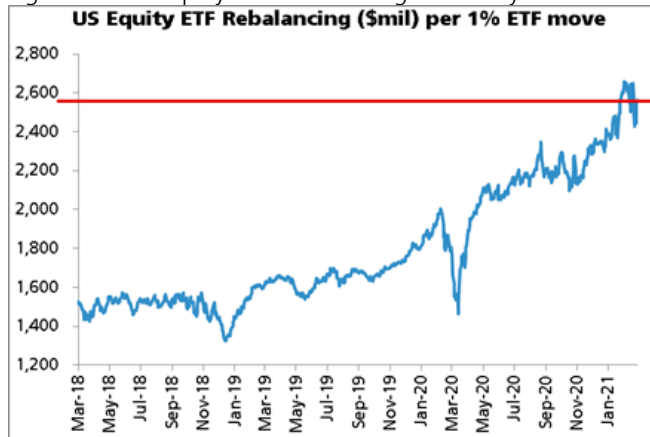


Figure 25: Money Market Funds AUM / SPX Market Cap

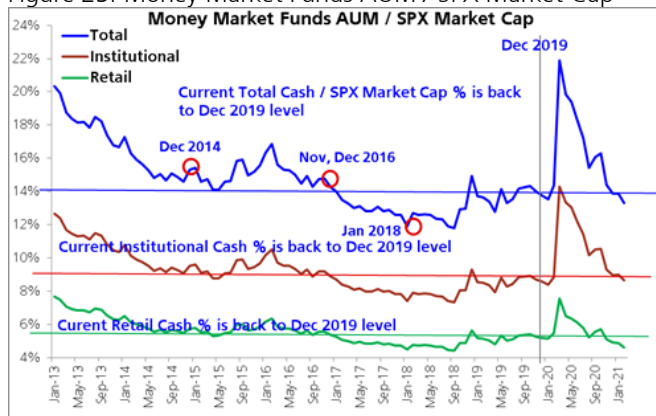


Figure 26: Retail Cash \$ trillion & % of SPX Mkt Cap

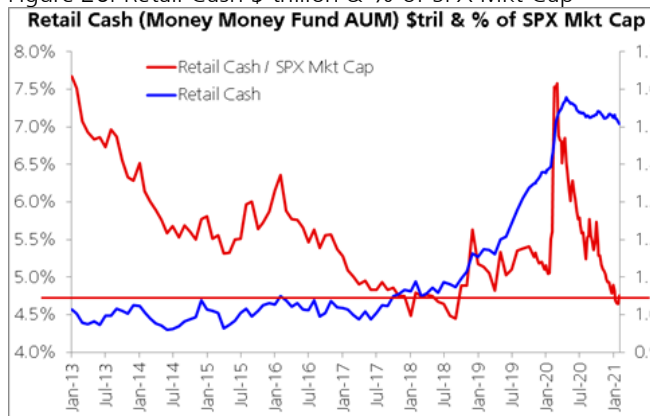


Figure 27: UBS PB L/S Clients Gross vs Net Leverages

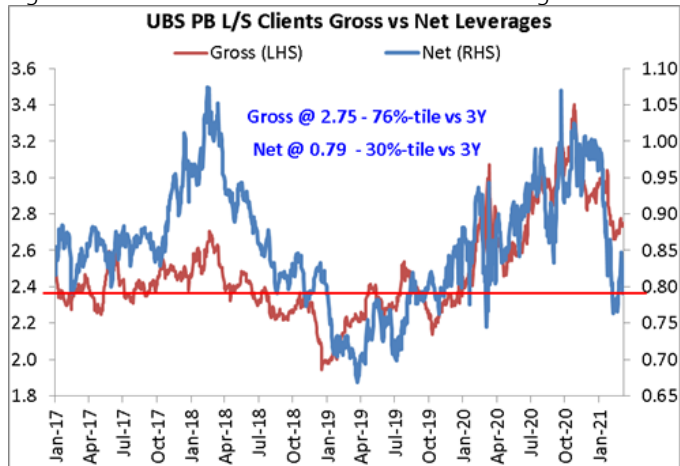


Figure 28: UBS PB L/S Clients NET Global Eq Exp Chg since Jan '20

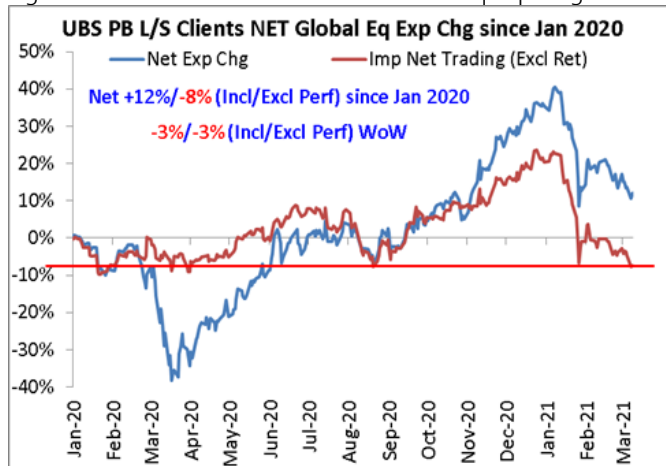


Figure 29: S&P 500 Total Short Interest

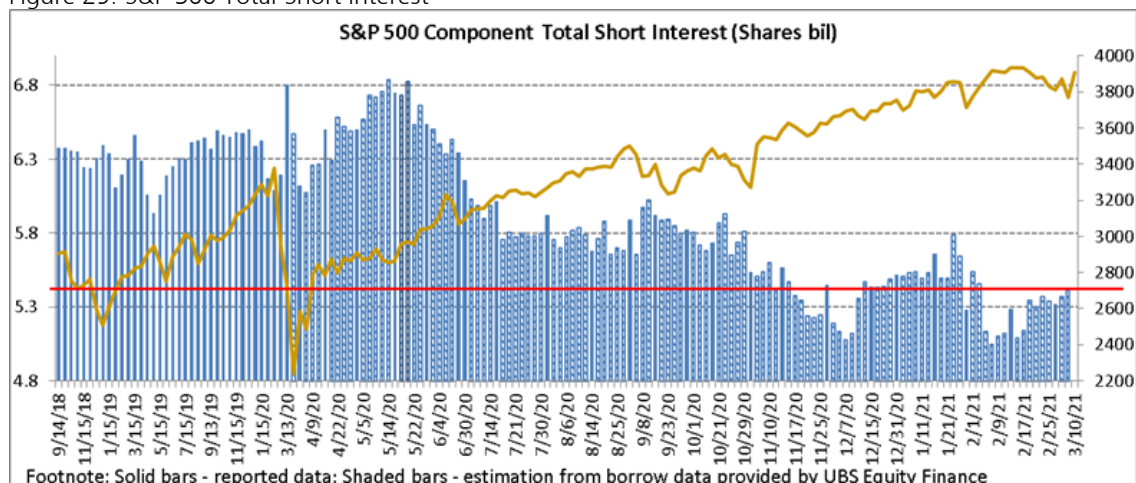


Figure 30: Russell 2000 Short Interest % of Market Cap

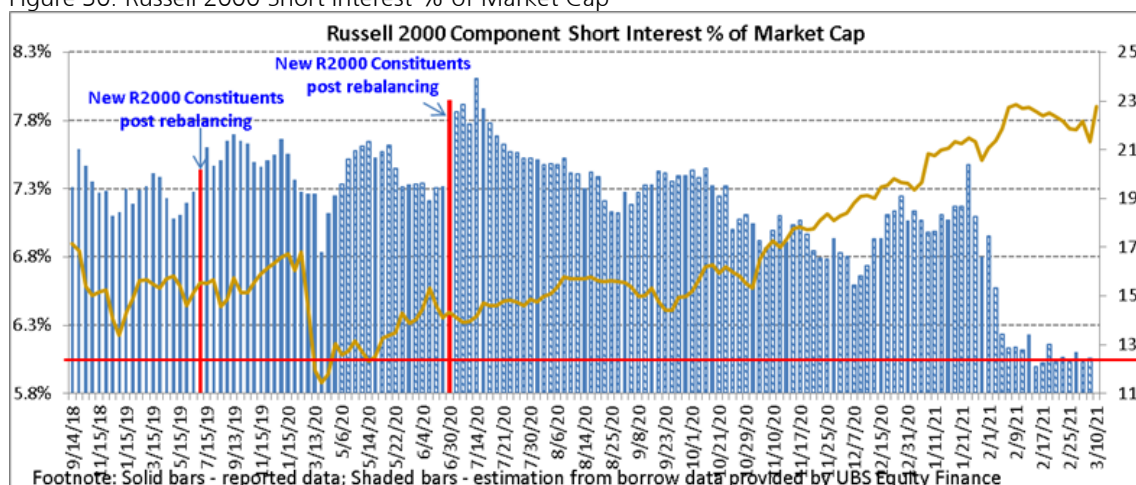


Figure 31: ETF Short Interest % of Shares

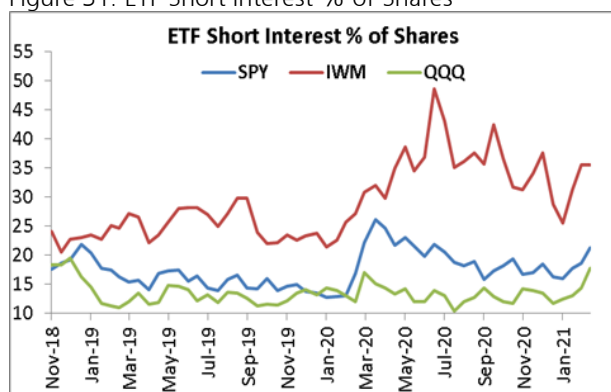


Figure 32: CFTC Leveraged Fund Exp in SPX Futures

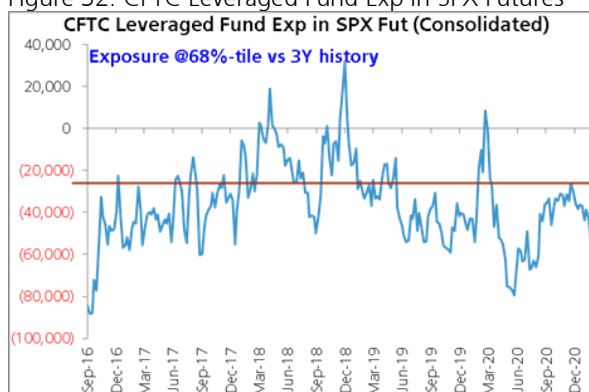


Figure 33: CFTC Leveraged Fund Exp in Russell 2000 Futures

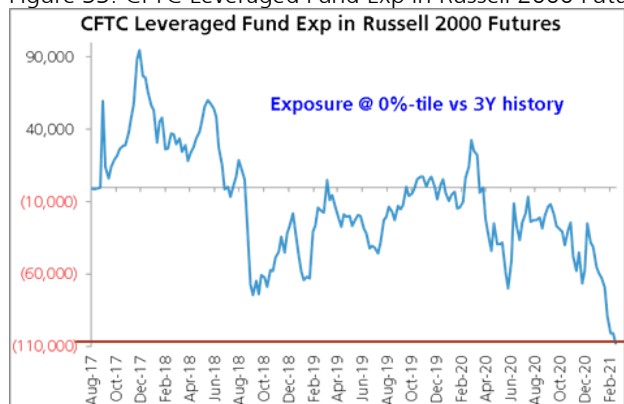


Figure 34: CFTC Leveraged Fund Exp in Nasdaq Futures

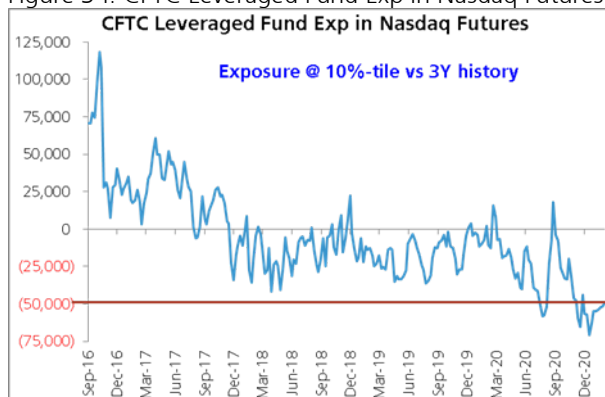
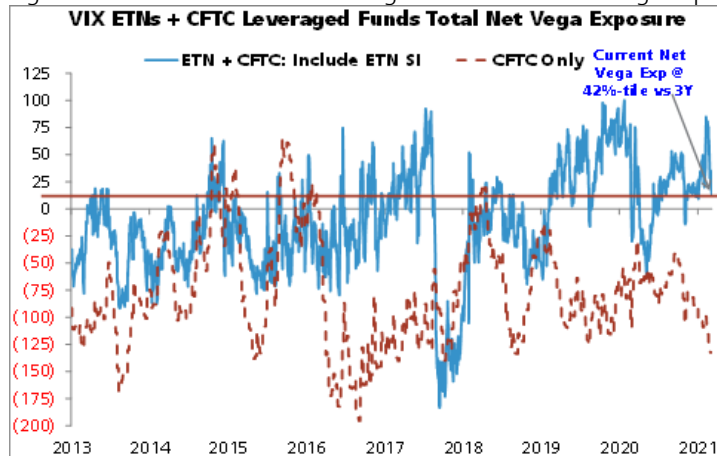
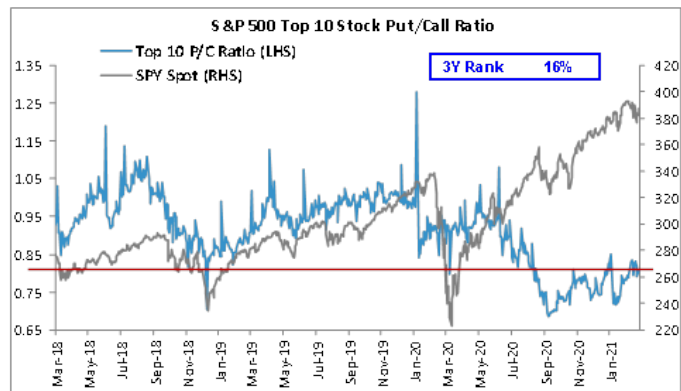
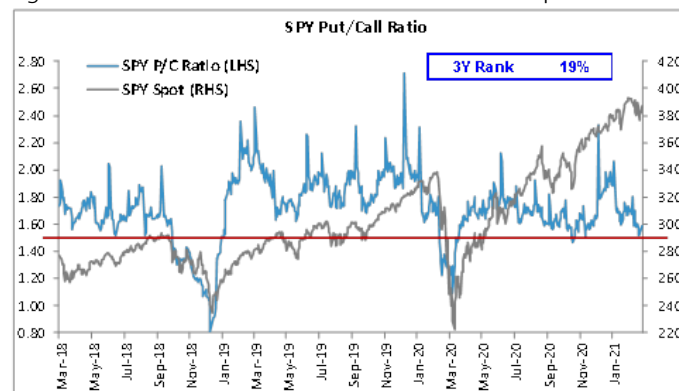


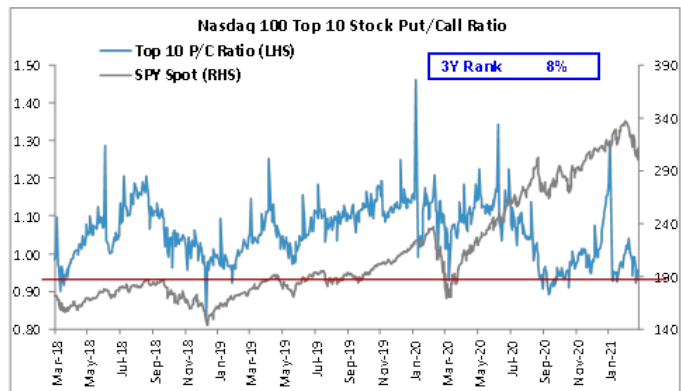
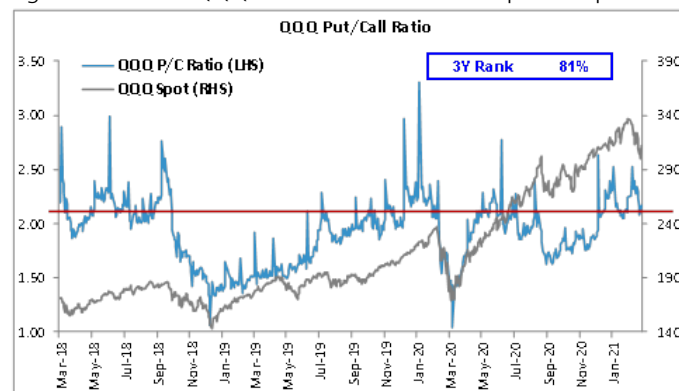
Figure 35: VIX ETNs + CFTC Leveraged Funds Total Net Vega Exp



Figures 37 & 38: SPY Put/Call Ratio & S&P 500 Top 10 Stock Put/Call Ratio



Figures 39 & 40: QQQ Put/Call Ratio & Nasdaq 100 Top 10 Stock Put/Call Ratio



Figures 41 & 42: IWM Put/Call Ratio & Russell 2000 Top 30 Stock Put/Call Ratio

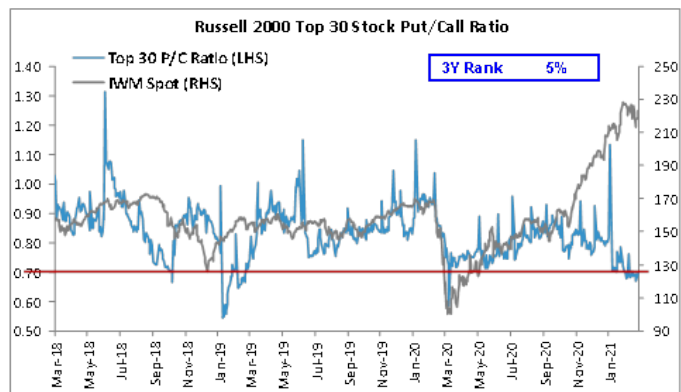
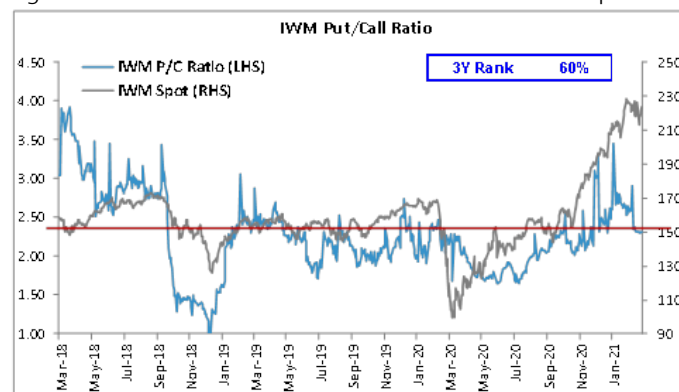


Figure 43: MF Flows in Global Equities

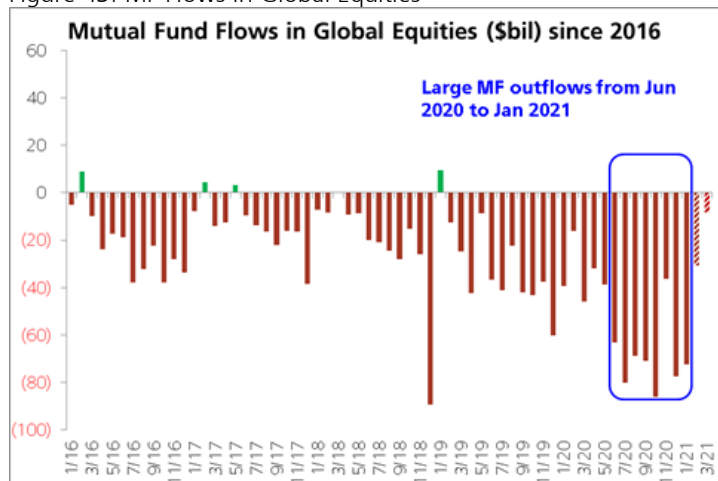


Figure 44: ETF Flows in Global Equities

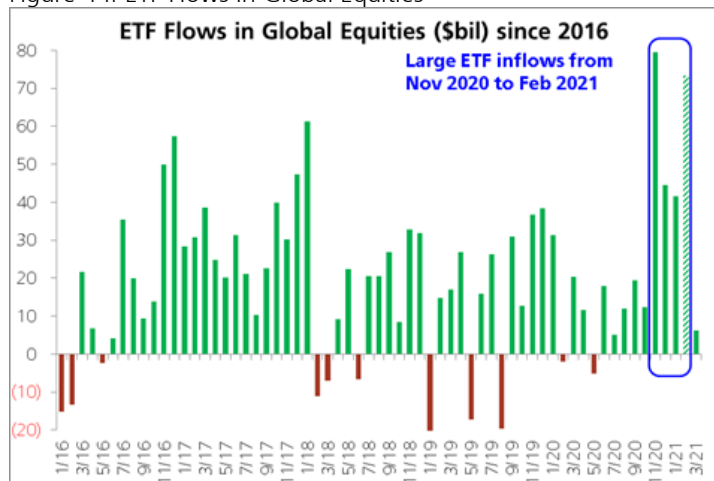


Figure 45: UBS RMM 3M Daily Equity Flow

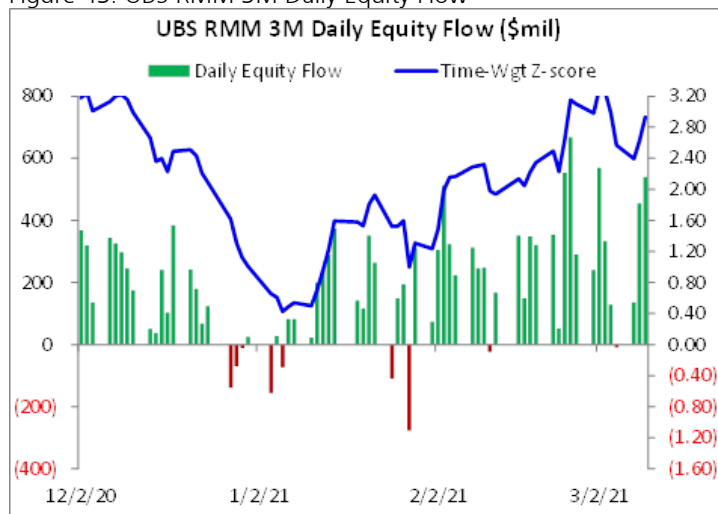


Figure 46: UBS RMM 3M Daily Fixed Income Flow

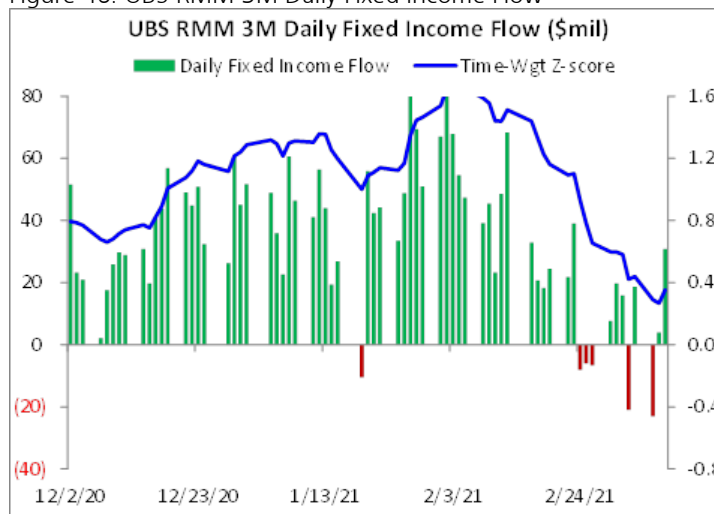


Figure 47: UBS RMM Cum Flow in Equity ETFs vs Stocks

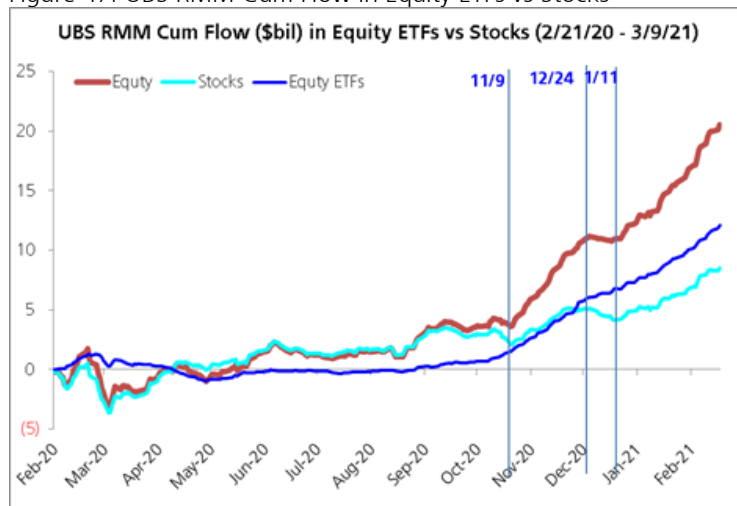
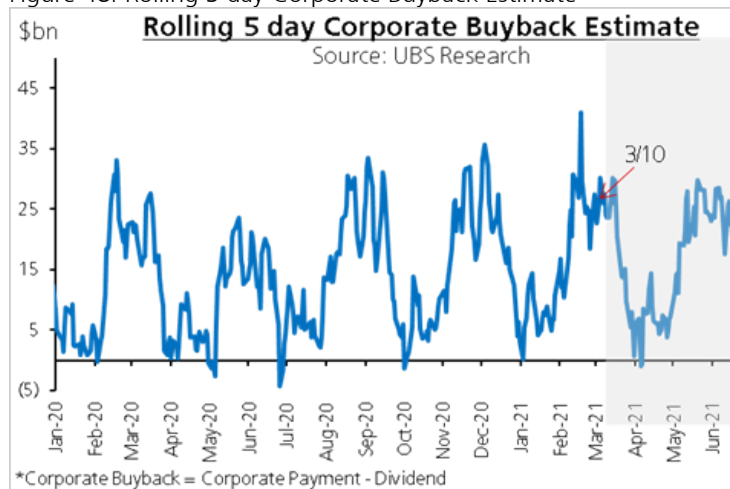


Figure 48: Rolling 5 day Corporate Buyback Estimate



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Sources: UBS Equity Derivatives Strategy, UBS Research, UBS Global Financing Services, UBS RMM Services, ICI, Bloomberg

*Please contact Data Solutions at ol-global-data-solutions@ubs.com for the underlying data for US Retail Market Maker Flow and Global Financing Services.

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