

## Global Equity Volatility Insights

## Equity vol complacent into FOMC

## What vol says about FOMC &amp; election and how to trade it

The S&P is implying a 1.2% move around this week's FOMC decision, a small risk for what rates markets see as the most uncertain FOMC meeting in modern history. But we think this record Fed uncertainty, tight polls 7wks pre-election, and jitters from the Aug fragility shock may keep equity vol elevated this fall. In our view, equity-rates and equity-FX hybrids are interesting in this backdrop to hedge equity sentiment deflating in case of a more hawkish than expected Fed. For the election, S&P options keep pricing a 2.5% 1-day reaction, a backdrop more like 2016 than 2020, though implied vol is rising for the 2-4wks after the vote (inc. the 7-Nov FOMC). Moreover, the flat post-election vol term structure appears to be a struggle between post-event resolution and escalation of risk. VIX Oct-Dec put calendars and Dec put 1x2s can use pre- and post-election vol floors respectively to play for a year-end vol reset lower, while VIX Jan call spreads funded by VIX Oct puts can offer a zero cost vol hedge in case of risk escalation post-election day.

## Exploiting vol-equity asymmetry with convexity strategies

On 5<sup>th</sup> August this year, the VIX rose 65% (close-to-close) whilst the underlying S&P dropped only 3%, a vol/spot beta significantly underpriced by skew. Since then, global equity indices have seen sustained levels of relatively elevated vol-of-vol, with VVIX largely sitting above 100 and in Europe the V-VSTOXX generally not far behind. Signs that early August's outsized moves in vol may lead to lingering vol fragility can be seen in the spot-vol dynamics of S&P options. Should these dynamics continue, strategies that sell OTM equity index puts to fully or partially fund OTM calls on vol stand to benefit from the asymmetry.

## TWSE rally hedge: 1x3 call ratios ahead of TSMC earnings

Post "YenMageddon" last month, TWSE skew has steepened significantly. Call skew remains near the steepest in recent years and is also stretched vs the last decade (83<sup>rd</sup> 10yr %-ile). This makes out-of-the-money (OTM) call options relatively cheap vs near the money calls. **For 7bps, investors can sell 1x Nov-24 22,300 call to fund 3x 23,500 calls.** 1x3 call ratios are ideal for investors that want an upside hedge, benefiting from spot-up/vol-up – a more common feature amid the AI-rally. With TWSE nearing its 50- and 100-day moving averages, breaks of such technical levels can attract additional buying flow (e.g. from trend-following investors). Also, with TSMC expected to report earnings on Oct 21<sup>st</sup>, an upside surprise could drive a stronger bid to OTM calls on the TWSE. In light of other risks such as the US election, call ratios are not exposed to market sell-offs, limiting losses to 7bps.

## Also in the GEVI:

Hunting for cheap hedges in German midcaps

Global cross-asset stress falls as equity risk declines led by skew subcomponents

Trading ideas and investment strategies discussed herein may give rise to significant risk and are not suitable for all investors. Investors should have experience in relevant markets and the financial resources to absorb any losses arising from applying these ideas or strategies.

>> Employed by a non-US affiliate of BofAS and is not registered/qualified as a research analyst under the FINRA rules.

Refer to "Other Important Disclosures" for information on certain BofA Securities entities that take responsibility for the information herein in particular jurisdictions.

**BofA Securities does and seeks to do business with issuers covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.**

**Refer to important disclosures on page 24 to 26. Analyst Certification on page 23. 12739968**

Timestamp: 17 September 2024 12:43AM EDT

17 September 2024

Equity Derivatives  
Global

BofA

Data  
Analytics



Global Equity Derivatives Rsch  
BofAS

**Gonzalo Asis**  
Equity-Linked Analyst  
BofAS

**Arjun Goyal**  
Equity-Linked Analyst  
BofAS

**Lars Naeckter >>**  
Equity-Linked Analyst  
Merrill Lynch (DIFC)

**Rupert Ansbro >>**  
Equity-Linked Analyst  
MLI (UK)

**Nitin Saksena**  
Equity-Linked Analyst  
BofAS

**Vittoria Volta >>**  
Equity-Linked Analyst  
BofASE (France)

**Benjamin Bowler**  
Equity-Linked Analyst  
BofAS  
[benjamin.bowler@bofa.com](mailto:benjamin.bowler@bofa.com)

**Abhinandan Deb >>**  
Equity-Linked Analyst  
MLI (UK)

**Nicholas Dunne**  
Equity-Linked Analyst  
BofAS

**Zhenhua Xue >>**  
Equity-Linked Analyst  
Merrill Lynch (Hong Kong)

[See Team Page for List of Analysts](#)

## Exhibit 1: 3M volatility (weekly chg)

Level and changes (in parentheses) in vol points

	Implied	Realized
S&P500	15.1 (-2.7)	15.7 (0.3)
ESTX50	14.9 (-2.3)	15.1 (-1.1)
FTSE	11.8 (-0.8)	10.3 (0.0)
DAX	14.2 (-2.0)	13.6 (-0.7)
NKY	22.5 (-1.2)	41.6 (0.6)
HSCEI	21.0 (0.2)	19.7 (0.0)
KOSPI	19.8 (-1.7)	27.4 (0.4)
EEM US	17.3 (-1.6)	15.7 (-0.2)
XIN9I	14.7 (1.1)	10.4 (0.4)

Source: BofA Global Research

BofA GLOBAL RESEARCH

# BofA GFSI™ X-Asset Risk Landscape

## Significant fall in equity stress fuels GFSI decline

Global equity upside returned last week partially reversing some of the declines that came in the first week of September. This resulted in a significant drop in equity stress that brought the GFSI from +0.19 on 6-Sep-24 to +0.12 on 13-Sep-24. The index is now in its 57<sup>th</sup> percentile since 2000.

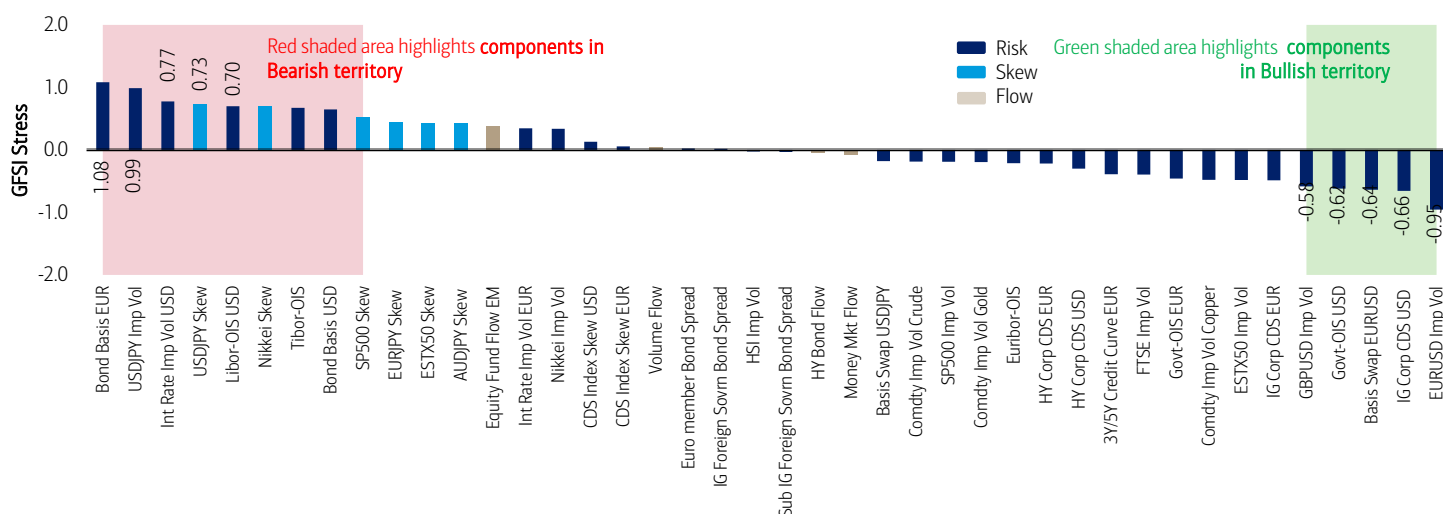
Equity stress recorded a 90<sup>th</sup> percentile weekly decline relative to its own history since 2000 as the top seven stress-decliners of the week were equities subcomponents. Equity skew subcomponents and volume flow, the subcomponent that measures bullish or bearish US stock volume, led stress lower last week (Exhibit 3). Equity vol was also the top stress-decliner versus all cross-asset vols and spreads as S&P 500 and ESTX50 implied vols posted 91<sup>st</sup> and 87<sup>th</sup> percentile weekly declines in stress, respectively (Exhibit 6 & Exhibit 7). Equities are now the second most stressed asset class after falling below FX stress levels, but equity stress is still just slightly elevated versus normal with stress in its 55<sup>th</sup> percentile (Exhibit 4).

Meanwhile, the other asset classes experienced smaller moves in stress with FX and commodity stress slightly falling as rates and credit stress rose (Exhibit 4). CDS index skew USD was the top stress-gainer of the week as it posted a 95<sup>th</sup> percentile stress gain relative to its own history (Exhibit 3 & Exhibit 6).

- **Japan experienced the largest regional stress decline** (Exhibit 5). The country is still the most stressed by a wide margin, and this was the eighth week in the last nine that Japan posted the largest absolute stress move.
- **The GFSI's Liquidity Risk Indicator recorded its largest weekly rise since last March's regional banking turmoil.** The indicator (GFSIRLIQ on Bloomberg) measures liquidity risk derived by funding spreads, as we describe in our [GFSI Primer](#) (see report). It was driven higher by Govt-OIS USD's 94<sup>th</sup> percentile rise in stress (Exhibit 6).

### Exhibit 2: Latest\* stress across GFSI sub-components

Bond Basis EUR is the most stressed while EURUSD implied vol is the least stressed

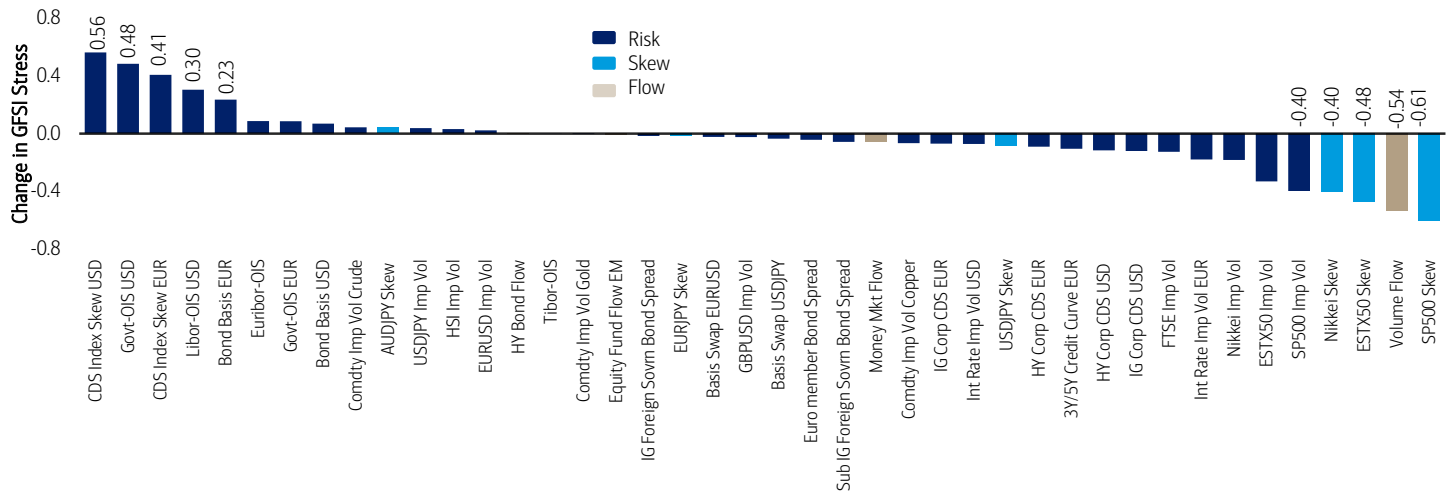


**Source:** BofA Global Research. \*Latest as of 13-Sep-24. Disclaimer: The indicator identified above as BofA GFSI is intended to be an indicative metric only and may not be used for reference purposes or as a measure of performance for any financial instrument or contract, or otherwise relied upon by third parties for any other purpose, without the prior written consent of BofA Global Research. This indicator was not created to act as a benchmark.



**Exhibit 3: Change\*\* in stress across GFSI sub-components**

CDS index skew USD was the largest stress riser over the last week while S&P 500 skew stress fell the most



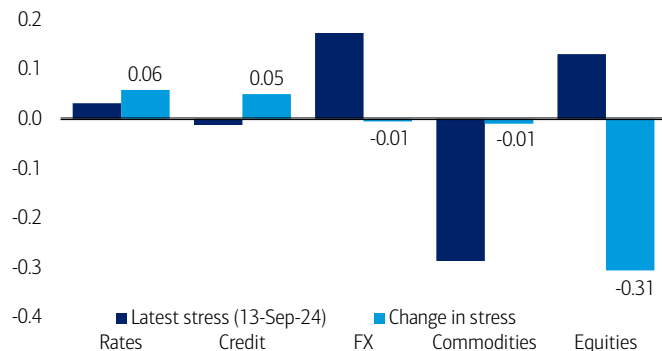
Source: BofA Global Research. \*\*Latest as of 13-Sep-24. Change vs 1 week prior (6-Sep-24).

BofA GLOBAL RESEARCH

The GFSI Risk Allocator (using Bull, Bear & Neutral weights of 2, 0, 1) suggested a 9.5% underweight position as of 13-Sep-24 (vs a 14.3% underweight position as of 6-Sep-24). The percentages of Bullish, Bearish, and Neutral GFSI components (as used in the Risk Allocator) as of 13-Sep-24 were 11.9%, 21.4%, and 66.7% respectively.

**Exhibit 4: Equity stress declined the most over the past week**

On the other hand, rates stress increased the most

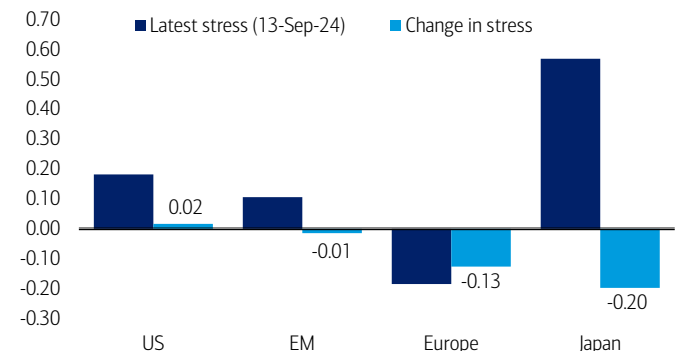


Source: BofA Global Research. 1wk change (6-Sep-24 to 13-Sep-24).

BofA GLOBAL RESEARCH

**Exhibit 5: Japan led regional stress lower last week**

In contrast, the US saw stress increase

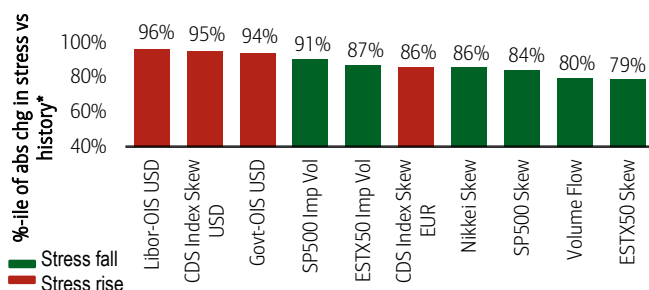


Source: BofA Global Research. 1wk change (6-Sep-24 to 13-Sep-24).

BofA GLOBAL RESEARCH

**Exhibit 6: Last week's top 10 biggest stress movers (vs history)**

S&P 500 implied vol saw a historically large stress decline

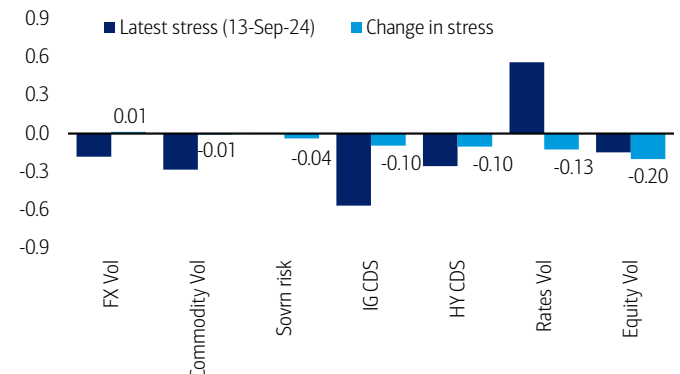


Source: BofA Global Research. \* %-ile of 1 week moves in stress vs all historical 1 week moves (earliest 3-Jan-00). Bar colors represent rise (red) or fall (green) in stress. 1wk change (6-Sep-24 to 13-Sep-24).

BofA GLOBAL RESEARCH

**Exhibit 7: Biggest stress movers in cross-asset vols and spreads**

Equity vol experienced the largest decline in stress last week



Source: BofA Global Research. 1wk change (6-Sep-24 to 13-Sep-24).

BofA GLOBAL RESEARCH

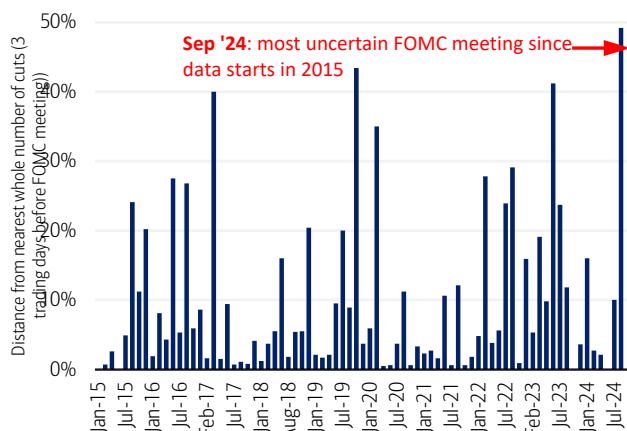
## What's priced in and how to position for FOMC and election

The most uncertain FOMC on record, tight US election polls, and memories of the 5-Aug fragility shock are keeping investors on edge (and volatility likely elevated) this fall.

Fed funds futures have never been less sure about an FOMC decision as they are about this week's (Exhibit 8). And 3m1y rates volatility, forced to price in a very wide range of Fed policy outcomes, has only ever been (slightly) higher in the worst of the 2022 hiking cycle (Exhibit 9), despite 2.6% CPI and no major economic or market stress.

### Exhibit 8: Most uncertain FOMC meeting on record

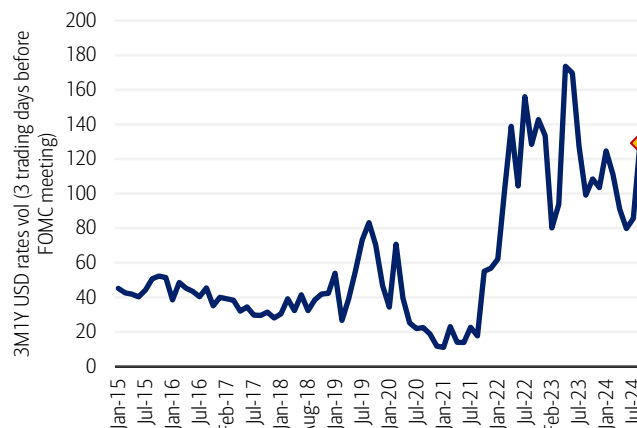
Distance from nearest whole number of priced-in cuts (3 trading days before FOMC)



Source: BofA Global Research, Bloomberg. Based on data from WIRP screen, as of 13-Sep-24.  
BofA GLOBAL RESEARCH

### Exhibit 9: Rates vol nearly as high as during worst of 2022 hiking cycle

3m1y USD rates vol (3 trading days before each FOMC meeting)



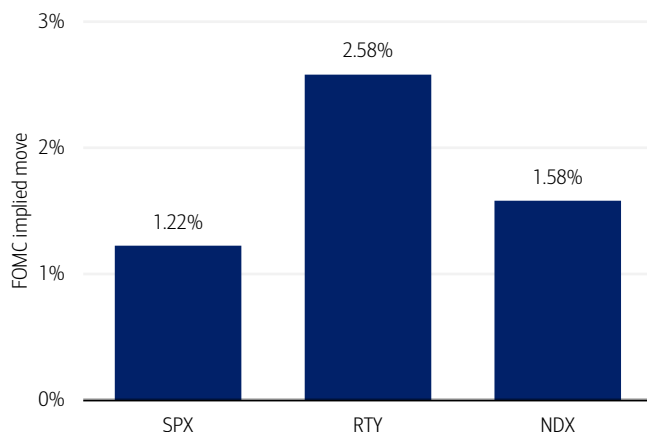
Source: BofA Global Research. Data from Jan-15 to 13-Sep-24.

BofA GLOBAL RESEARCH

Equities, on the other hand, appear complacent compared to the risks priced into rates markets. This is particularly true for the S&P, which is pricing in just north of a 1.2% implied move for Wednesday's FOMC decision (Exhibit 10), a number that doesn't stand out relative to the last two years (since SPX Tuesday options were listed and allow us to compute a true 1-day implied move; see Exhibit 11).

### Exhibit 10: SPX, RTY, and NDX are pricing in around 1.2%, 2.6%, and 1.6% moves for FOMC day this Wednesday

SPX, RTY, NDX implied daily move for this week's FOMC decision

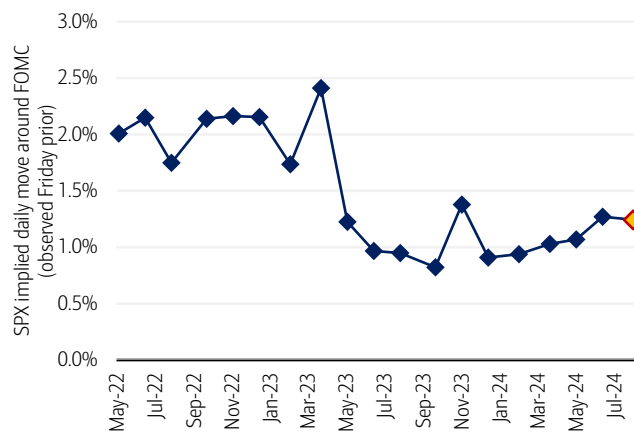


Source: BofA Global Research. Data as of 16-Sep.

BofA GLOBAL RESEARCH

### Exhibit 11: The SPX implied move for this week's FOMC is not particularly high compared to the last couple of years

SPX implied daily move around FOMC meetings (observed Friday prior)



Source: BofA Global Research. Data as of 13-Sep close.

BofA GLOBAL RESEARCH

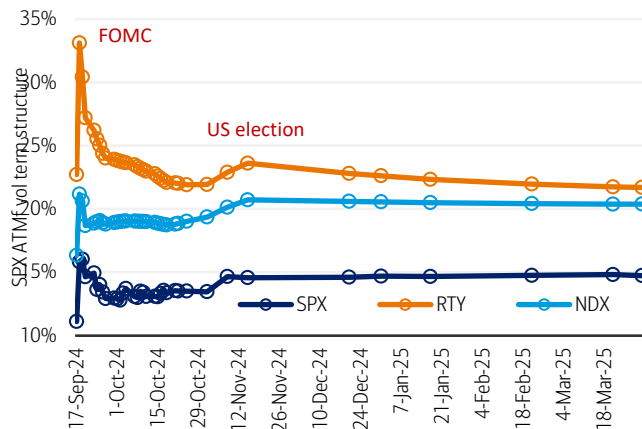
Consistent with a much higher reactivity to rates in the last two years, small caps are pricing in about twice the S&P's move (Exhibit 10), which is also evident when



comparing the vol term structures of the 3 main indices (SPX, RTY, NDX; Exhibit 12). The term structures also make clear what the market is most focused on now: the Fed. The next big catalyst is also obvious, though: the US Presidential election.

**Exhibit 12: Equity indices seem focused on this week's FOMC, with the election the next obvious major catalyst in volatility term structures, which appear unusually flat after the vote**

ATMf vol term structure in SPX, RTY, and NDX



Source: BofA Global Research. Data as of 16-Sep.

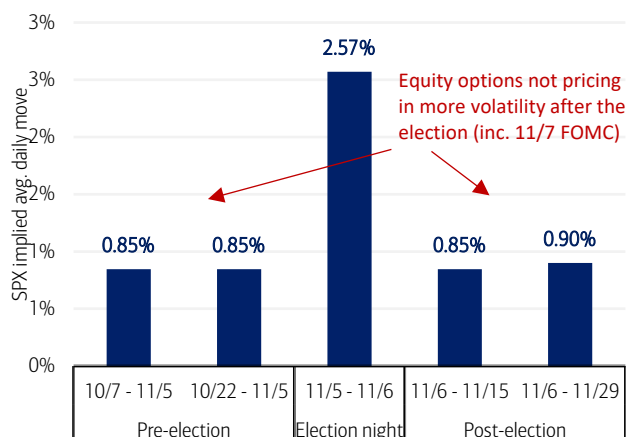
BofA GLOBAL RESEARCH

With just 7 weeks to go until the election, here's what equity options are currently pricing:

- S&P election day implied move = 2.57%, a level that has only been realized close-to-close once since 1948 (in 2008). In the 2-4 weeks post-election (which include the 7-Nov FOMC decision), SPX is expected to move on avg. 0.85% to 0.90% per day, notably similar to the amount of volatility expected in the 2-4 weeks pre-election (Exhibit 13).
- The SPX volatility term structure appears unusually flat through 2025 (Exhibit 12), perhaps as markets struggle to time the removal of uncertainty from the Fed + election (plus recession concerns in a world of volatile macro data).
- The amount of S&P volatility priced in for the entire month surrounding the election (from 18-Oct to 15-Nov regular SPX expiries) has remained relatively constant in the last few months (outside of the Aug and Sep market selloffs; Exhibit 14). However, implied volatility around the vote has risen slightly for RTY and NDX, with the RTY/SPX implied move ratio at its highest level today.
- How does this backdrop compare to past election cycles? Exhibit 17 shows that the VIX futures curve has a much smaller kink at the October tenor than it did around this time in 2020, and is much flatter in general than in 2016 (with the caveat that 2016 was an era of very steep term structure).
- But the current snapshot misses the fact that the VIX election risk premium (measured as the level of the Sep/Oct/Nov fly) has been falling steadily from 2020 extremes towards the more muted 2016 levels (Exhibit 15), which now appears to be the better analogue. Exhibit 16 shows that the driver is likely not a collapse in the price of risk around Nov 5<sup>th</sup>, but rather a slight relative pick-up in stress priced in for the month after the vote.

**Exhibit 13: The S&P is expected to move ~2.5% on election day, and around 0.85% per day on avg. in the 2-4 weeks pre- & post-election**

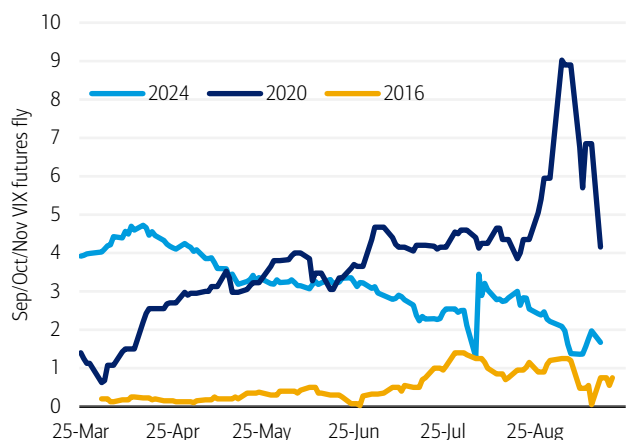
Volatility implied on election day (5-6 Nov) and in the weeks before &amp; after



Source: BofA Global Research. Data as of 13-Sep. Based on implied volatility of SPX ATMf options.  
BofA GLOBAL RESEARCH

**Exhibit 15: The election risk premium in the VIX futures curve has been falling from 2020 extremes towards the more muted 2016 levels**

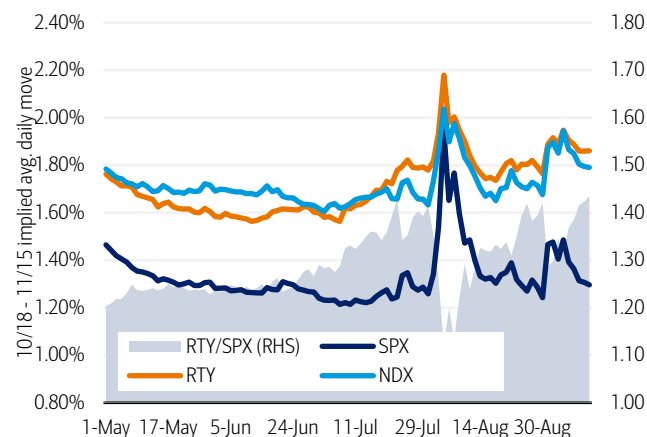
VIX Sep/Oct/Nov (-1/+2/-1) futures fly ahead of 2016, 2020 &amp; 2024 elections



Source: BofA Global Research. Data from late March of each year until Sep expiry. As of 9/16/24.  
BofA GLOBAL RESEARCH

**Exhibit 14: S&P 500 implied vol in the month around the election has been fairly constant, while RTY and NDX vol have risen slightly**

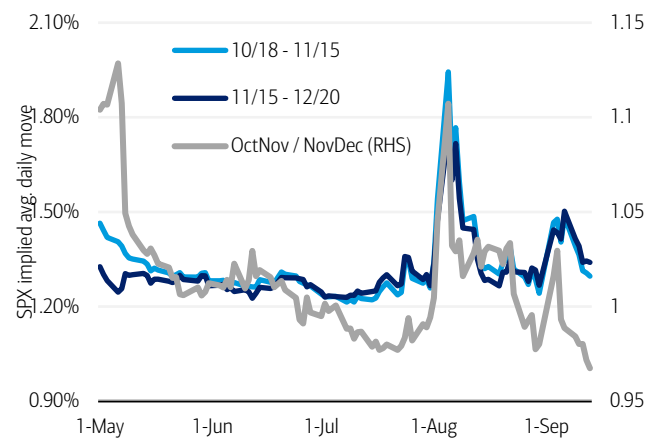
Evolution of avg. daily move implied between 18-Oct and 15-Nov expiries



Source: BofA Global Research. Data from 14-Aug-24 to 13-Sep-24. Based on SPX variance.  
BofA GLOBAL RESEARCH

**Exhibit 16: The VIX election fly's fall is likely not from less vol priced in for 5-Nov, but relatively higher risk in the weeks after the vote**

Evolution of SPX avg. daily move implied between Oct/Nov, Nov/Dec expiries

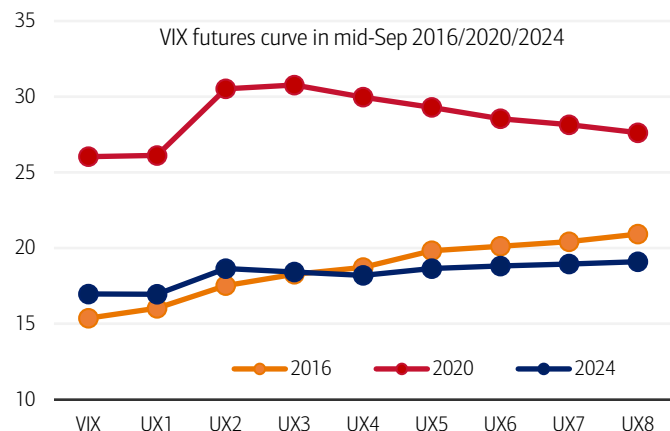


Source: BofA Global Research. Data from 14-Aug-24 to 13-Sep-24. Based on SPX variance.  
BofA GLOBAL RESEARCH



**Exhibit 17: The VIX futures curve has a much smaller kink in Oct than it did this time in 2020, and is much flatter than in 2016 (with the caveat that 2016 was an era of very steep term structure)**

Snapshot of VIX futures curve in mid-Sep 2016, 2020, and 2024



Source: BofA Global Research. Data as of 16-Sep-24.

BofA GLOBAL RESEARCH

**Hybrids to protect against equities complacent to policy uncertainty**

As the start of the cutting cycle approaches, equities have quickly retraced recent weakness and the S&P is now a whisker away from all-time highs. However, the risk of some of this optimism draining due to a mis-estimation of forward policy remains high and one to consider hedging in our view. The risk remains particularly elevated given rates markets are showing the least conviction on policy on record (Exhibit 8).

S&P down, rates up hybrids are structures that we continue to like to target and hedge this risk, particularly given their prevailing favourable correlation entry point (i.e., selling positive implied correlation). However, as an alternative, we also like considering a variation of this trade via S&P down, EURUSD down.

**Trade #1 (SPX down, rates up):** Buy SPX < 98% / 2y SOFR > ATMf + 25bps Dec24 dual digital for 9.1% indicatively (~11x max payout ratio, +16 correl bid, SPX spot ref. 5616, 2y SOFR fwd ref. 3.043%).

**Trade #2 (SPX down, EUR down):** Buy SPX < 98% / EURUSD < 99.6% Dec24 dual digital for 15.2% indicative (~6.6x max payout ratio, +20 correl offer, SPX spot ref. 5616, EURUSD spot ref. 1.11245).

*Risks for both trades involve upfront premium paid.*

A retracement higher in US rates would typically be seen as favourable for the dollar, thereby capturing the higher rates scenario from the FX perspective (particularly in the backdrop of a more dovish ECB that has already begun its cutting cycle). While the correlation entry point for this trade is not as favourable as the equity-rates expression, we still find this alternative interesting for a few reasons:

- **Favourable EUR vol entry point:** While EUR vol has risen from its recent lows, it still remains low vs history (Exhibit 18). This is in contrast to the rates vol entry point, which has picked up significantly and back near 2022 levels (Exhibit 9).

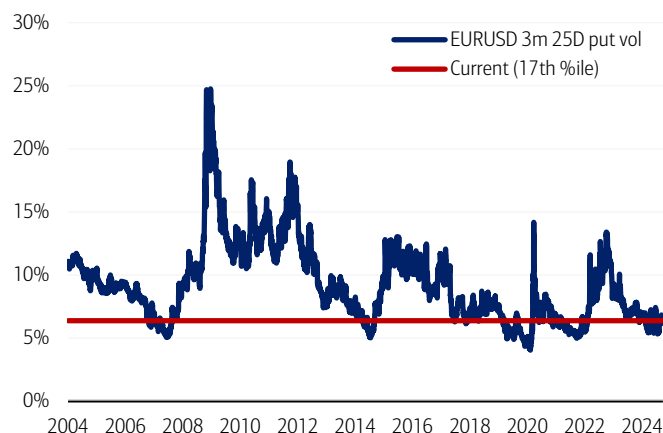


- **Historical reliability:** Comparing the historical backcast of the two hybrid expressions, the S&P-EUR hybrid has a noticeably higher hit rate in equity-down scenarios than the S&P-rates hybrid (Exhibit 19).
- **Potential to also cover rates-down tail scenarios:** Extreme risk-off scenarios that are usually accompanied with a rates rally (e.g., Covid, SVB etc.) can leave S&P down, rates up hybrids vulnerable. S&P down, EURUSD down structures could be more resilient since such tail scenarios may temporarily see a stronger dollar from a flight-to-safety concurrent with an S&P selloff despite the rates rally.

For shorter-term protection, we like using optionality on defensive sectors, whether to hedge the downside or upside in a risk-limited manner (see [16-Sep-24 Trading Catalysts](#) for more details).

**Exhibit 18: Despite EUR vol having bounced off the lows of earlier this year, it remains at historically low levels and motivates considering S&P-EUR hybrids as an alternative hedge**

EURUSD 3m 25D put vol

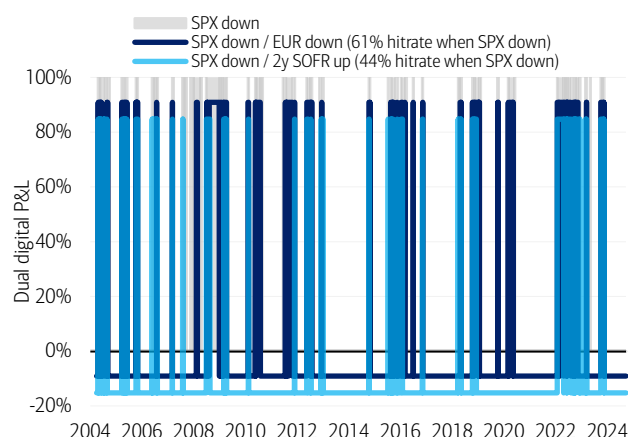


Source: BofA Global Research, Bloomberg. Data 1-Jan-04 to 16-Sep-24.

BofA GLOBAL RESEARCH

**Exhibit 19: While its correlation entry point is not as favourable, the S&P down, EUR down hybrid has paid out more often in selloffs over the past 20 years than a comparable S&P down, rates up hybrid**

Backcast of SPX < 98% / EUR < 99.6% dual digitals vs SPX < 98% / 2y SOFR > ATMf+25bps\*



Source: BofA Global Research. Data from 1-Jan-04 to 16-Sep-24. Assumes current pricing and historical returns. FX and rates legs of hybrids are approximately equivalent in delta. \*Assumes a fixed spread between 2y SOFR swap spot and fwd historically (3.31% spot vs 3.04% fwd).

BofA GLOBAL RESEARCH

**Use flat vol term structure to hedge post-election resolution...or escalation**

As mentioned previously, the essentially flat term structure of S&P vol post-election seem to imply that markets are struggling to time the removal of uncertainty post-election (Exhibit 12). However, we find it unlikely for this shape to persist into the post-election period, with either (i) resolution of risk leading vol to reset lower, or (i) an escalation in concern driving it higher.

One way to hedge a reset in vol lower post-election is via VIX put calendars, which sells the pre-election October put to fund the post-election December put. The Oct-Dec VIX future spread is close to its tightest levels all year, creating an attractive entry point for such a put calendar to fade post-election vol (Exhibit 20). Moreover, with spot VIX back in the teens, we again find it interesting to specifically sell the 17-strike October VIX put, since this strike remains below the YTD lows of the relatively range-bound October VIX future.

**Trade #3 (VIX put calendar):** Sell VIX Oct24 17 put to buy VIX Dec24 17 put for net cost of \$1.32 indicatively (UXV4 ref. 18.75, UXZ4 ref. 18.27).

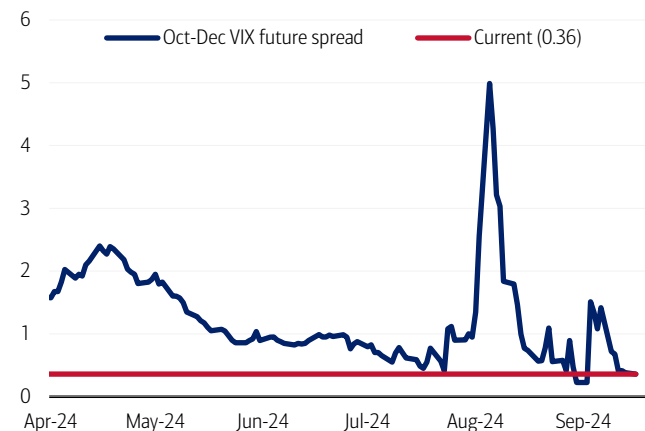




*Risk involves losses on short Oct put exceeding gains on long Dec put.*

**Exhibit 20: The spread between the October and December VIX futures is close to as tight as it's been all year, creating an attractive entry point for put calendars to fade post-election vol**

Spread between Oct24 VIX future (UXV4) & Dec24 VIX future (UXZ4)



Source: BofA Global Research. Data from 1-Apr-24 to 16-Sep-24.

BofA GLOBAL RESEARCH

As an alternative to selling the pre-election vol floor, one can also consider selling (a much lower) post-election vol floor. VIX Dec put 1x2 ratios can help achieve this, with a similar cost proposition to the -Oct/+Dec put calendar. Political risks in the post-election period (not limited to a contested outcome) along with 2 FOMC meetings and numerous data releases can be seen as vol supportive above the low teens even after election day.

**Trade #4 (VIX put 1x2):** Buy VIX Dec24 17 / 14 put 1x2 (+1x / -2x) for \$1.27 indicatively (UXZ4 ref. 18.27).

*Risk involves losses on short 14-strike puts exceeding gains on long 17-strike put.*

Lastly, to hedge a rise in vol due to post-election escalation of risk, one can consider Jan25 VIX call spreads funded with the 17-strike October VIX put for an indicative *net zero* cost. We specifically favour the January expiry in this instance since it also covers the December FOMC meeting (the Dec VIX future expires the morning of the meeting).

**Trade #5 (zero-cost VIX hedge):** Sell VIX Oct24 17 put to buy VIX Jan25 22 / 27 call spread for zero cost indicatively (UXV4 ref. 18.75, UXF5 ref. 18.71).

*Risk involves losses on short Oct put exceeding gains on long Jan call spread.*

## Exploiting volatility-equity asymmetry with long-convexity strategies

**What:** Exploit heightened volatility/equity convexity through strategies that sell OTM equity puts to fully or partially fund OTM calls on vol

**Why:** Should the recent fragility in volatility and elevated vol-of-vol breed further asymmetry into the relationship between vol and equity, strategies that seek to benefit from volatility/equity convexity could prove fruitful. Specifically, strategies that sell OTM SPX 3m puts or put-spreads to fully or partially fund OTM 3m calls on VIX would have already performed strongly through August and September this year, and a continuation of fragile vol dynamics as we move towards the winter could lead to further asymmetry in reward vs. risk for these strategies.

On 5<sup>th</sup> August this year, the VIX closed 65% up whilst the underlying S&P had dropped only 3%. Since then, global equity indices have seen sustained levels of relatively elevated vol-of-vol. The VVIX (S&P implied vol-of-vol index) has been largely sitting above 100 for the last 2 months, while in Europe the VV2TX (ESTOXX implied vol-of-vol index) has generally remained close below it. Should early August's outsized moves in volatility lead to lingering vol fragility moving forward, we see it as prudent to keep abreast of the state of the relationship between volatility and equity.

We note:

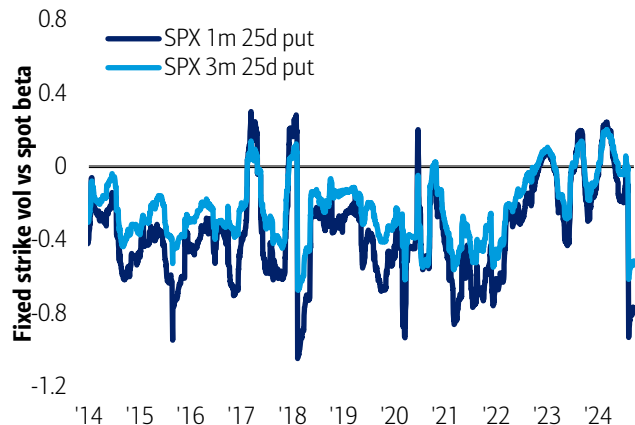
- The spot-vol beta in S&P options has shifted strongly negative since the start of August, while in ESTOXX options this has been echoed to lesser extent (Exhibits 21 and 22).
- Recent moves in S&P vol have greatly outsized the vol moves predicted by the S&P vol skew. Notably, the beta between S&P vol changes and "skew-predicted" vol changes has jumped to its highest level in history. For ESTOXX options however, this beta remains below 1 (indicative of skew overestimating moves in vol, Exhibits 23 and 24).
- Even when excluding the early August's convexity, we see that vol futures recently have become more sensitive to underlying spot returns, especially for VIX futures (Exhibits 25 and 26).

Should equity indices see a continuation of vol moves outsizing their historical relationship with spot returns, "long convexity" strategies that sell OTM equity puts to fully or partially fund OTM calls on vol (which would have already performed strongly in August and September) will stand to benefit further (Exhibit 28). From a tactical lens, we also note that the number of VIX 3M 25d calls that could be fully funded by selling SPX 3M 25d puts has been relatively stable post-COVID, and is not notably depressed despite currently elevated levels of vol-of-vol.



### Exhibit 21: Early August's volatility convexity saw the spot-vol beta of SPX 3m OTM puts jump to strongly negative...

63-day beta of daily changes in fixed strike implied volatility vs daily returns in underlying spot for SPX options

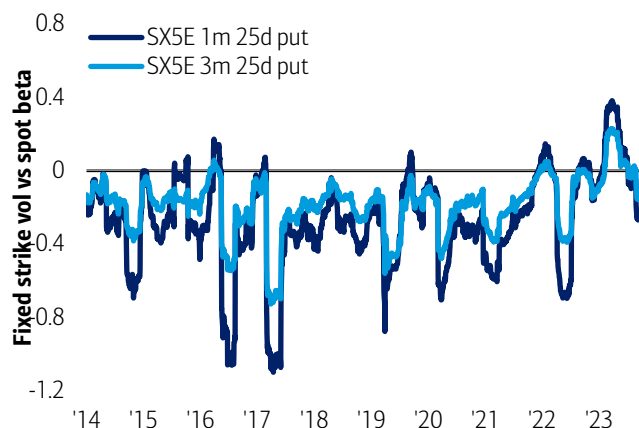


Source: BofA Global Research, Bloomberg. Data from 14-Sep-2014 to 13-Sep-2024.

BofA GLOBAL RESEARCH

### Exhibit 22: ... which was echoed to a lesser extent for 3m SX5E puts

63-day beta of daily changes in fixed strike implied volatility vs daily returns in underlying spot for SX5E options

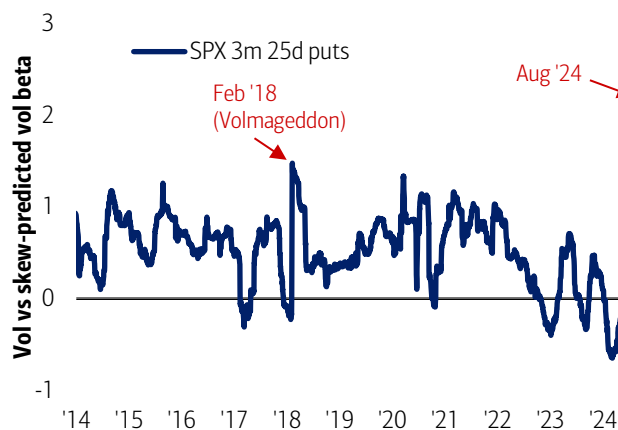


Source: BofA Global Research, Bloomberg. Data from 14-Sep-2014 to 13-Sep-2024.

BofA GLOBAL RESEARCH

### Exhibit 23: Recent moves in SPX 3m put vols have been greatly underestimated by equity vol skew...

63-day beta of daily changes in implied volatility vs daily skew-predicted\* changes in implied volatility for SPX options

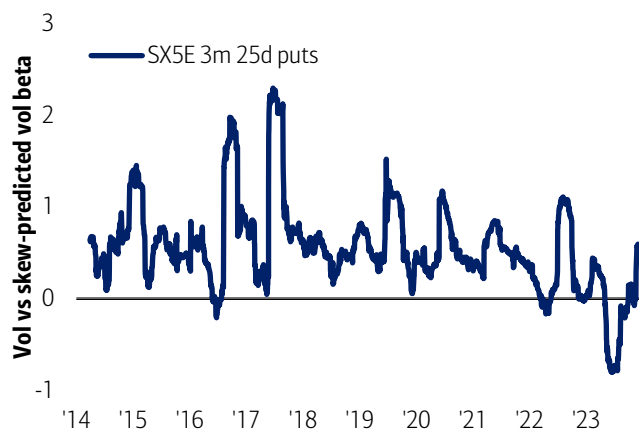


Source: BofA Global Research, Bloomberg. Data from 14-Sep-2014 to 13-Sep-2024. \*Skew-predicted vol change is defined as the normalised skew from the previous day's close multiplied by the spot return multiplied by -1.

BofA GLOBAL RESEARCH

### Exhibit 24: ... which again has been reflected to a lesser extent in SX5E options

63-day beta of 1-day changes in implied volatility vs 1-day skew-predicted\* changes in implied volatility for SX5E options

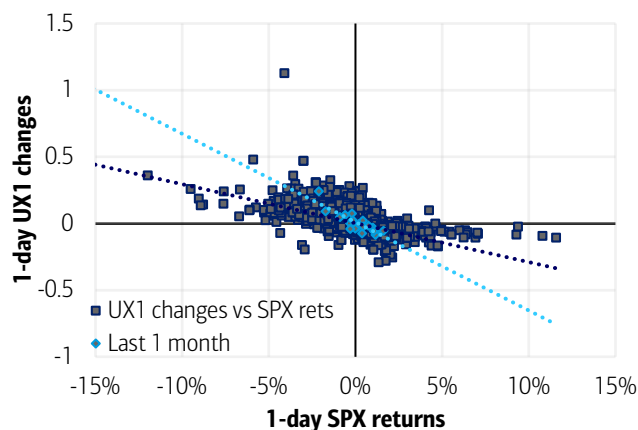


Source: BofA Global Research, Bloomberg. Data from 14-Sep-2014 to 13-Sep-2024. \*Skew-predicted vol change is defined as the normalised skew from the previous day's close multiplied by the spot return multiplied by -1.

BofA GLOBAL RESEARCH

### Exhibit 25: VIX futures have become more sensitive to SPX spot moves, even after the early August fragility shock

Daily changes in UX1 prices vs daily returns in SPX, last 1m highlighted

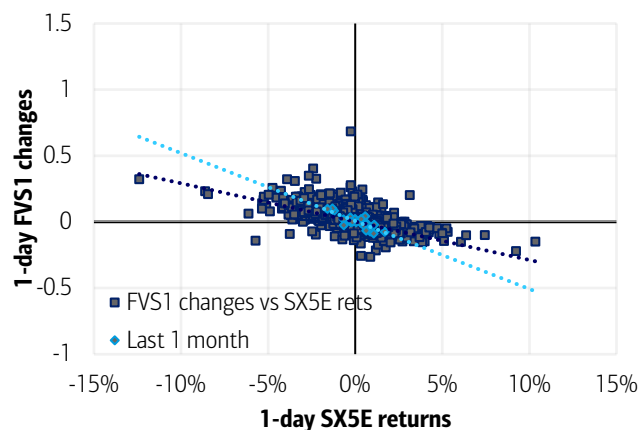


Source: BofA Global Research, Bloomberg. Data from 26-Mar-04 to 13-Sep-24. Last 1m data from 14-Aug-24.

BofA GLOBAL RESEARCH

### Exhibit 26: In Europe, V2X futures have been more sensitive to SX5E returns lately, but once again, to a lesser extent than in the US

Daily changes in FVS1 prices vs daily returns in SX5E, last 1m highlighted

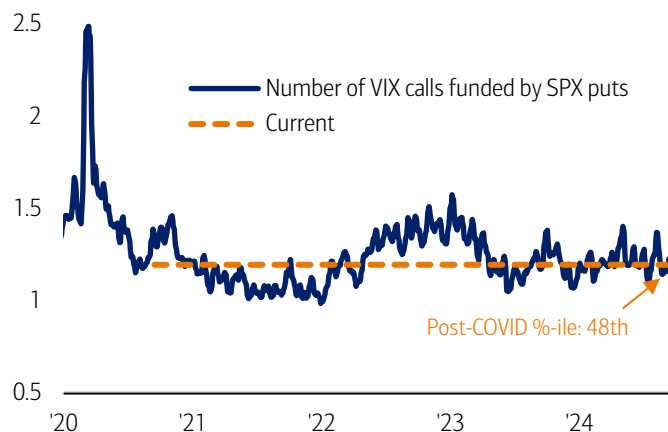


Source: BofA Global Research, Bloomberg. Data from 2-Jun-09 to 13-Sep-24. Last 1m data from 14-Aug-24.

BofA GLOBAL RESEARCH

### Exhibit 27: The number of VIX OTM calls that can be funded by the sale of SPX OTM puts has been relatively stable post-COVID, despite recent elevated vol-of-vol

The number of VIX 3M 25d calls that could be fully funded by selling SPX 3M 25d puts corresponding to \$100 SPX notional



Source: BofA Global Research, Bloomberg. Data from 2-Jan-20 to 13-Sep-24. Post-COVID data from 14-Sep-20.

BofA GLOBAL RESEARCH

### Exhibit 28: Strategies that benefit from the convex relationship between VIX and SPX options would have performed strongly through August and September this year

Full hedge strategy sells SPX 3M OTM put spreads and spends the whole premium on VIX 3M OTM calls; Defensive alpha strategy sells SPX 3M OTM put spreads and spends the half of the premium on VIX 3M OTM calls



Source: BofA Global Research, Bloomberg. Data from 1-Sep-23 to 13-Sep-24. This performance is back-tested and does not represent actual performance of any account or fund. Back-tested performance depicts theoretical (not actual) performance of a particular strategy over the time period indicated. No representation is being made that any actual portfolio is likely to have achieved returns similar to those shown herein.

BofA GLOBAL RESEARCH



## Hunting for cheap hedges on German midcaps

**What:** Consider buying 3m (~Dec24) puts/put spreads on low vol MDAX names that have recently outperformed. Liquidity permitting, we also like buying a put on a basket of these names if recession risks intensify.

**Why:** We recently commented that Germany has emerged as a notable weak spot in the Eurozone, with its outlook worsening at a faster pace than the rest of the region (read our recent GEVI: [August fragility leads fall volatility](#)). Despite this, German equities as proxied by the DAX appear to have shrugged off risks to growth and have kept rising in line with broader European equities (e.g., SX5E, see Exhibit 29). In contrast, domestic German weakness has been more clearly reflected in MDAX (Mid-cap German equities) performance, which has underperformed the DAX by over 25% in the past year.

This stark outperformance of DAX vs MDAX can be partly explained by the DAX's high gearing to Financials and Tech, sectors that have risen significantly since last year (e.g., SX7E +30%, SX8P +19%). In addition, the MDAX is mostly tied to Industrials, Communication Services and Materials, sectors that have been more vulnerable to a growth slowdown and weaker demand from China (see Exhibit 30).

To investors who wish to hedge further weakness in the German economy, we recommend long puts/put spreads on liquid, optionable names within the MDAX (there is no listed option liquidity on the index). In Exhibit 32, we rank MDAX constituents based on:

- (i) Low current 3m (~Dec24) ATMf IV;
- (ii) Historically low 3m ATMf IV (i.e., low 5y percentile rank);
- (iii) Recent outperformance vs MDAX (since 5-Aug-24 local low).

Should liquidity allow, we also like buying a put on a basket of these top names to potentially benefit from a pick-up in stock correlation if recession fears intensify. If recent realised volatility is a good reflection of implied volatility, we think there's value in owning German midcap vol, as 3m MDAX RV dropped below that of DAX for the first time since 2022 (Exhibit 31).

**Risk:** Losses are limited to the premium paid.



**Exhibit 29: The divergence between DAX and MDAX (DAX Mid-cap) is over 25% in 1y**

DAX, MDAX and SX5E relative performance (rebased as of 1y ago)

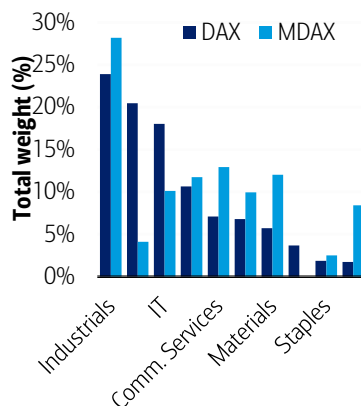


Source: BofA Global Research, Bloomberg. Data from 13-Sep-23 to 13-Sep-24.

BofA GLOBAL RESEARCH

**Exhibit 30: Indeed, DAX's high gearing to Fins and IT helped drive out-performance**

Sector percentage weights in current index composition\*



Source: BofA Global Research, Bloomberg. Data as of 13-Sep-24. \*We account for the upcoming MDAX index composition changes.

BofA GLOBAL RESEARCH

**Exhibit 31: MDAX 3m RV recently fell below that of DAX for the first time since '22**

DAX and MDAX 3m realized volatility



Source: BofA Global Research, Bloomberg. Data from 13-Sep-23 to 13-Sep-24.

BofA GLOBAL RESEARCH

**Exhibit 32: Consider buying 3m (~Dec24) puts/put spreads on liquid, low vol MDAX names that have recently outperformed the MDAX**

Within the liquid, optionable MDAX universe, we rank names based on: (i) current low 3m (~Dec24) ATMf IV; (ii) historically low 3m ATMf IV (i.e., low 5y percentile rank); (iii) Recent outperformance vs MDAX (since 5-Aug-24 local low). Names with total option notional OI < 50mn EUR are shown in grey.

	Name	Sector	3m ATMf IV (A)	3m ATMf IV 5y %ile* (B)	Outperformance vs MDAX** (C)	Total Rank (A, B, C)	Total OI outstanding (mn €)
G1A GY	GEA GROUP AG	Industrials	19.1%	4%	3.0%	4.0	3.8
EVK GY	EVONIK INDUSTRIE	Materials	21.1%	9%	0.9%	6.0	32.8
LHA GY	DEUTSCHE LUFT-RG	Industrials	27.4%	4%	-1.6%	7.0	401.9
NEM GY	NEMETSCHEK SE	IT	29.4%	7%	-0.4%	8.7	7.2
NDA GY	AURUBIS AG	Materials	30.3%	34%	4.4%	9.0	222.8
KBX GY	KNORR-BREMSE AG	Industrials	23.8%	43%	2.6%	9.0	10.6
NDX1 GY	NORDEX SE	Industrials	43.3%	16%	12.2%	10.3	40.7
FRA GY	FRAPORT AG	Industrials	28.4%	23%	-1.2%	9.7	17.1
TUI1 GY	TUI AG	Discretionary	41.5%	13%	4.3%	11.0	116.9
LEG GY	LEG IMMOBILIEN S	Real Estate	28.5%	56%	6.3%	10.7	61.8
HOT GY	HOCHTIEF AG	Industrials	28.3%	43%	-3.3%	11.7	34.4
BC8 GY	BECHTLE AG	IT	28.2%	36%	-12.5%	12.7	4.2
SAX GY	STROER SE & CO	Comm. Services	26.8%	45%	-10.0%	12.3	48.4
LXS GY	LANXESS AG	Materials	36.4%	62%	7.9%	13.7	49.8
WCH GY	WACKER CHEMIE AG	Materials	35.3%	30%	-8.9%	13.7	22.0
FME GY	FRESENIUS MEDICA	Health Care	31.1%	65%	2.6%	14.3	64.2
DHER GY	DELIVERY HERO SE	Discretionary	63.6%	60%	38.8%	15.3	193.6
BFSA GY	BEFESA SA	Industrials	32.8%	42%	-18.4%	16.7	1.2
HFG GY	HELLOFRESH SE	Staples	73.1%	90%	52.1%	17.0	31.9
UTDI GY	UNITED INTERN-RE	Comm. Services	44.1%	97%	10.7%	17.7	4.8
PUM GY	PUMA SE	Discretionary	34.4%	60%	-15.5%	18.7	140.4
KGX GY	KION GROUP AG	Industrials	37.6%	68%	-6.0%	18.7	12.4
TMV GY	TEAMVIEWER SE	IT	42.8%	55%	-11.8%	19.0	85.9
TKA GY	THYSSENKRUPP AG	Materials	46.1%	51%	-16.8%	21.3	27.2
BOSS GY	HUGO BOSS -ORD	Discretionary	38.7%	86%	-12.3%	20.7	217.1
AFX GY	CARL ZEISS ME-BR	Health Care	40.1%	93%	-14.9%	22.3	67.7

Source: BofA Global Research, Bloomberg. Data from 13-Sep-19 to 13-Sep-24. \*NEM GY, BFSA GY, HFG GY, TMV GY have < 5y of implied volatility available. \*\*Outperformance of each name vs MDAX since 5-Aug-24, local low for equities.

BofA GLOBAL RESEARCH



## TWSE rally hedge: 1x3 call ratios for 7bps ahead of TSMC earnings

**Buy:** Buy 3x TWSE 20-Nov-24 23,500 calls and sell 1x 20-Nov-24 22,300 call for a total cost of TW\$15 (~0.07% of spot, spot ref: 21,850) -1x 22,300 call: \$536, 42d, 19.9v / +3x 23,500 call: \$184, 19.4d, 19.1v

**Why:** Post “YenMageddon” last month, TWSE skew has steepened significantly. Call skew remains near the steepest in recent years and is also stretched vs the last decade (84<sup>th</sup> 10yr %-ile, see Exhibits 35-36). This makes out-of-the-money (OTM) call options relatively cheap vs near the money calls. For 7bps, investors can sell 1x Nov-24 22,300 call to fund 3x 23,500 calls. Call ratios are ideal for investors that want an upside hedge that benefits from spot-up/vol-up (Exhibit 34).

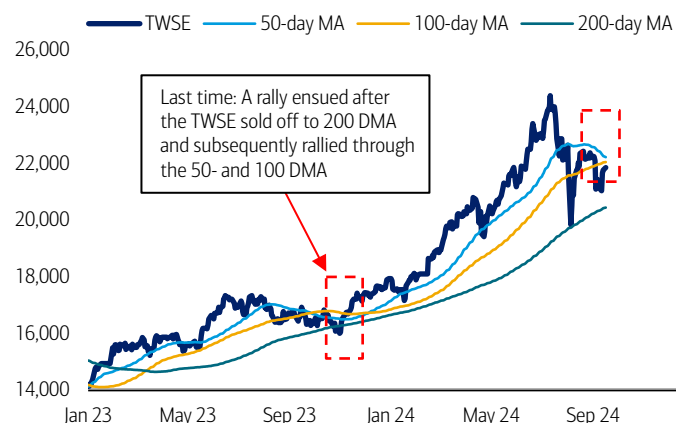
With TWSE nearing its 50- and 100-day moving averages, (Exhibit 33) breaks of such technical levels can sometimes attract additional buying flow (e.g. from trend-following investors). Also, with TSMC expected to report earnings on Oct 21<sup>st</sup>, an upside surprise could drive strong spot-up/vol-up dynamics, with TWSE calls catching a bid. Indeed, the TWSE has exhibited stronger spot-up/vol-up dynamics since the AI trade kicked off (introduction of ChatGPT in Nov-2022, see Exhibit 37).

In light of other risks such as the US election, call ratios are not exposed to market sell-offs as calls would expire worthless, limiting losses to 0.07% (Exhibit 38).

**Risk:** Max loss of 1,200 in case spot closes at 23,500 as of Nov expiry. As such, investors should consider rolling early in case of small moves on TSMC earnings and/or the US election on Nov 5<sup>th</sup>.

### Exhibit 33: TWSE is trading just below its 50- and 100-day moving averages (1.7% and 0.9% above spot at 21,850)

TWSE spot at 21,850 vs 22,220 and 22,046 for the 50- and 100-day MA

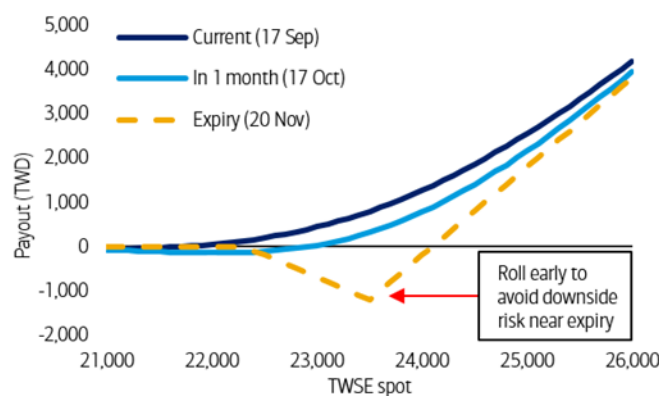


Source: BofA Global Research and Bloomberg. Data from 2-Jan-23 to 16-Sep-24.

BofA GLOBAL RESEARCH

### Exhibit 34: Payout and mark-to-market estimate of a TWSE 20-Nov-24 1x3 call ratio. Consider rolling early if a strong rally does not ensue – this would keep carry costs relatively low

Short 1x 22,300 call and long 3x 23,500 calls



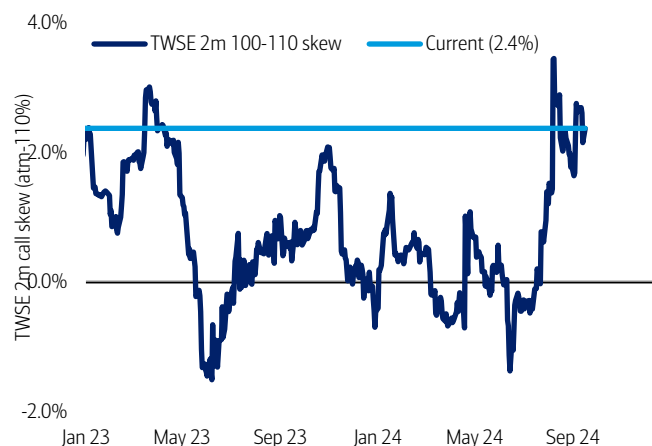
Source: BofA Global Research and Bloomberg. Data as of 16-Sep-24.

BofA GLOBAL RESEARCH



**Exhibit 35: TWSE 2-month call skew is near the steepest in years, trading in its 95<sup>th</sup> and 84<sup>th</sup> 1yr and 10yr percentiles, respectively**

TWSE 2-month call skew (100% vol – 110% vol)

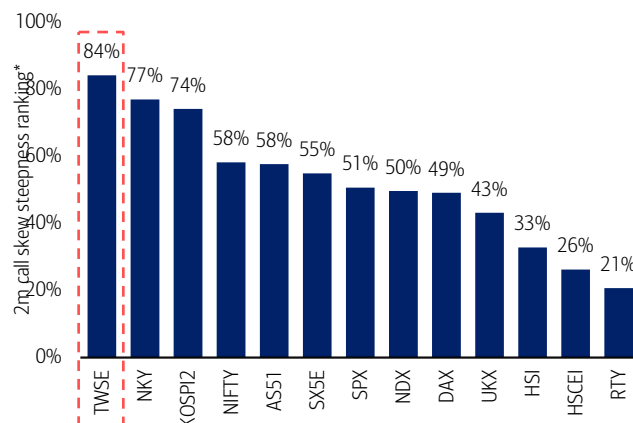


Source: BofA Global Research and Bloomberg. Data from 2-Jan-23 to 16-Sep-24.

BofA GLOBAL RESEARCH

**Exhibit 36: TWSE call skew ranks as steepest globally while another Tech-heavy index, the Nasdaq (NDX), has a call skew in more “normal” territory**

2-mtn call skew (100% strike vol minus 110% strike vol)

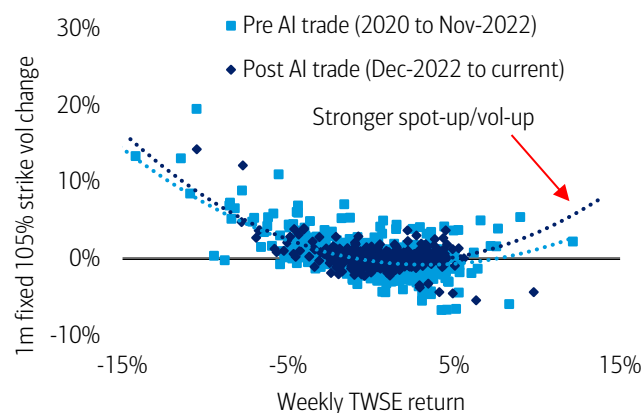


Source: BofA Global Research. Data as of from 16-Sep-2009 through 16-Sep-2024. \*Ranking is the average of the following percentiles for each index: 1y, 2y, 3y, 5y, 10y and 15y.

BofA GLOBAL RESEARCH

**Exhibit 37: The AI rally that kicked off ~2 years ago has brought a stronger vol-up/spot-up tendency to TWSE. On balance, this translates to making long OTM call trades – such as 1x3 call ratios – more attractive**

1-month fixed strike vol change\* as a function of weekly TWSE returns

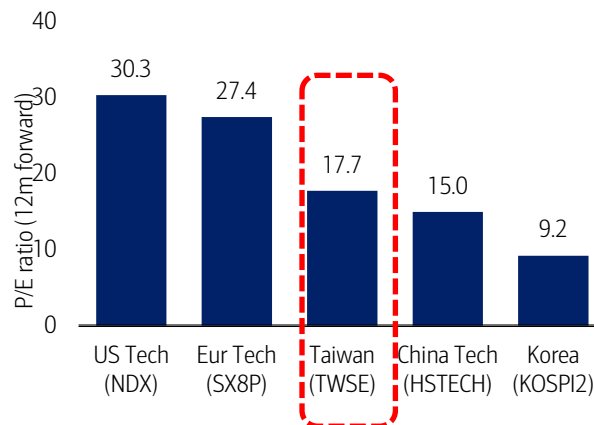


Source: BofA Global Research and Bloomberg. Data from 2-Jan-20 to 13-Sep-24. \* Fixed strike vol change measured on the \$ strike corresponding to 105% at trade initiation.

BofA GLOBAL RESEARCH

**Exhibit 38: Based on forward PE, Taiwanese stocks trade at a 42% discount to Nasdaq 100 (IT makes up 65% of the TWSE and 50% of the Nasdaq 100)**

PE ratios (12m fwd) of US, Europe, Taiwan, China, and Korea



Source: BofA Global Research and Bloomberg. Data as of 16-Sep-24.

BofA GLOBAL RESEARCH

**High exposure to semi-conductors likely putting a high floor to TWSE**

Most markets in Asia have struggled to bounce back after “YenMageddon” last month. However, Taiwanese stocks have fared relatively well. Compared to the Kospi 200, for example, the TWSE bounced and never broke below its 200-day moving average. The close link to Nvidia certainly helps, as long as Nvidia’s dips are bought. Additionally, while pre-orders of iPhone 16 Pro may disappoint, being the main manufacturer for the iPhone will likely keep TSMC’s revenues strong. Not least, TWSE can be bought at a sub-18 forward PE, offering a 42% discount to the Nasdaq’s 30+ (Exhibit 38).



# Summary of Open Trades (16-Sep-24)

Price data for open level reflects the price on open date and does not necessarily reflect the price at which the trade could be executed at the date of this report. Our trades are structured to be executed on the open date and are not necessarily appropriate to execute as formulated beyond that date.

**Table 1: Summary of open trades as of 16-Sep-24**

Summary of open trades as of 16-Sep-24

Trade Description	Open Date	Open Level	Expected Trade Term	Rationale
Long 3y, short 4y ESTX50 Total Return Futures (TRFs) offer 7bps of implied carry, an expected 1y P&L* of 19bps (both elevated vs history in the 72nd and 97th 5Y percentiles, respectively), and attractive risk-reward	19-Oct-21	62bps	Dec-24	Long 3y (~Dec24), short 4y (~Dec25) trades screen particularly attractive: their 7bps of implied carry lies in the 72nd 5y percentile and the expected 1y P&L (assuming the curve remains unchanged) of 19bps lies in its 97th 5y percentile – both of which are the highest across long, short pairs
i) Long Dec24 ESTX50 divs (ref 115.2)	23-Nov-21	115.2	Dec24	Dividends are set to benefit from higher inflation and a recovery in earnings, while implied yields remain low. Risks: Dividends realising less than current implied levels. S&P dividends rising (falling) less (more) than ESTX50 divs will see the relative value trade underperform
Replicate ESTX50 Dec24-Dec25 3900 FVA with a static option portfolio implying an FVA level of 16.2v (vs OTC level of 19.3v)	22-Nov-22	19.3v	Dec-24	Backwardation in vol term structure makes fwd starting vol lower; Expensive fwd var argues for vol replication, for a 3+ vol pt cheapening vs OTC, a level at ~2/3rd of YTD realised vol (and 13v lower than fwd var). Shift to participation products may steepen vol term structure
Buy SX5E Dec24 div future at 113.4, which is over-pricing recession risk	22-Nov-22	113.4	Dec-24	Dividends are likely to be resilient and backwardation in the div curve creates value that has favourable risk/reward vs bear scenarios. We estimate 2024 dividends may have 8-10% ann. upside potential
Fund NKY Dec-24 36,500 calls by selling 25,000 30,000 put spreads for nearly zero cost (JPY 24 or ~0.07%, spot ref: 33,037, 49d)	06-Sep-23	0.07%	Dec-24	Nikkei options uniquely attractive for upside trades while limiting downside
Buy ESTX50 Dec24 70% UpVar funded by ESTX50 Dec24 Var to collect 3.5v (spot ref. 4167.37)	26-Sep-23	3.5v	26-Dec-24	Wings of carry: Harvest longer-dated ESTX50 var vs upvar
Long SX7E Dec24/Dec25 fwd-starting var replication: Long Dec25 60%-120% corridor var replication* & short Dec24 60% upvar replication for 22.4v (~6v disc. with replication; SX7E spot ref: 113.70)	21-Nov-23	22.4v	Dec-24	Alpha from still-stressed variance premia for long or short volatility
Harvest SPX var premium: Buy SPX Dec24 60% upvar replication, funded by Dec24 Var to collect 3.0v (SPX spot ref: 4508.24)	21-Nov-23	3.0v (Credit)	Dec-24	Alpha from still-stressed variance premia for long or short volatility
Sell 0.55x NKY Dec-24 95% 75% put spreads to fund Dec-24 SPX 95% 75% put spread for 0% (indic. spot refs: 4.547 & 33.354)	21-Nov-23	0%	Dec-24	Record dislocation: fund S&P puts with just half number of short NKY puts
Buy NKY Dec-24 105% calls contingent on USDJPY in the [98%, 103%] range for 1.98% (corresponds to [147.0, 154.5] at a 150 JPY ref) (indic. 58% discount to vanilla @4.73%, 55 correl offer)	21-Nov-23	1.98%	Dec-24	Nikkei upside at 58% discount if USDJPY trades range-bound amid stable rates
Buy NKY Dec-24 105% calls contingent on USDJPY in the [98%, 103%] range for 1.50% (corresponds to [142.3, 149.6] at a 145.2 JPY ref) (indic. 64% discount to vanilla @4.22%, 46/52 correl bid/offer)	09-Jan-23	1.50%	Dec-24	Dec-24 NKY upside remains attractive. Hybrids can cheapen a further 64%
Buy SX7E Dec24-Dec25 Forward Var corridor replication* for 22.4v (~6v discount with replication, spot ref: 118.66).	17-Jan-24	22.4v	Dec-24	How to buy EZ Banks vol on the cheap
Buy NDX Dec24 ATM Upvar for 16.3v (t & t-1 convention, Dec24 var ref: 23.9v).	5-Feb-24	16.3v	Dec-24	Hedge melt-up bubble scenario by buying upside vol, and leverage attractive discount from dislocated put side tail vol
Buy NDX Dec24 80% Upvar for 19.6v (t & t-1 convention, Dec24 var ref: 23.9v).	5-Feb-24	19.6v	Dec-24	Hedge melt-up bubble scenario by buying upside vol, and leverage attractive discount from dislocated put side tail vol
Buy CSI 1000(1) 20-Sep-24 110% calls for 4.98% (+27d, 37.3v)	5-Feb-24	4.98%	20-Sep-24	China small cap capitulation: Call options offer a limited-risk way to buy the dip
Buy SX8P 90% Upvar for 20.9v and buy ASML and SAP Dec24 ~90% Upvar replication* for 27.7v and 21.1v, respectively (spot refs: 859.50 and 164.24)	21-Feb24	20.9/27.7/21.1v	Dec-24	EU Tech better than "magnificent"? Leverage low vol & hedge potential melt-up
Buy 1x SX7E Dec24 25d (~112%) call, fully funded by a SXP Dec24 35d (~104%)f call (spot refs: SX7E: 123.20, SXP: 497.24)	27-Feb-24	0%	Dec-24	Record cheap upside RV: Long/short Dec24 calls on EZ Banks vs STOXX600
Buy an SX5E Dec26 5000 call (for 9% indic., spot ref 4895, 45delta, 62bps vega), initially delta-hedged	5-Mar-24	9%	Dec-26	Don't miss a generational opportunity to lock in record low long-dated EU vol
Buy an SPX Sep24 95% resettable put with single monthly reset until Jun24 and reset barrier of 105% for 2.22% indic. (34bp premium to vanilla, spot ref: 5123.69)	11-Mar-24	2.22%	Sep-24	With upside momentum perhaps driving spot higher in the near term, the resettable and maxlookback structures would move downside protection levels higher on a commensurate basis, thereby reducing the risk of mis-timing a market peak
Buy an SPX Sep24 95% max lookback put with reset in Jun24 (monthly observation) for 2.58% indic. (70bp premium to vanilla, spot ref: 5123.69)	11-Mar-24	2.58%	Sep-24	With upside momentum perhaps driving spot higher in the near term, the resettable and maxlookback structures would move downside protection levels higher on a commensurate basis, thereby reducing the risk of mis-timing a market peak
Buy an SX5E Dec26 5000 call (for 9% indic., spot ref 4895, 45delta, 62bps vega), initially delta-hedged	05-Mar-24	9%	Dec-26	Attractive opportunity to lock in record low long-dated EU vol
Buy & RTY Sep 100% call on an equally weighted basket, sell equal notional of INDU, NDX & RTY Sep 100% worst-of calls for 3.35% (44% discount to average individual call, spot ref. 38790.43, 17985.01, 2024.74)	18-Mar-24	3.35%	Sep-24	Buy basket calls and short worst of call structures that allow for broad-based equity upside participation and use optionality to potentially tilt exposure towards outperforming sectors/factors
Buy a 12-Sep-24 105% Worst of call on NKY, KOSPI2 & TWSE for 0.74% (qUSD, 70% discount to avg. vanilla calls)	25-Mar-24	0.74% (qUSD)	12-Sep-24	Rent global AI stocks at a significant 76% discount via worst-of-calls
Sep24 SXPP > UKX 105% outperformance call, contingent on UKX > 0 at expiry, for 2.17% (implied correl: 58%, fwd: 99.9% for SXPP; 100.5% for UKX)	09-Apr-24	2.17%	Sep-24	Cheaply position for even more SXPP upside via cheap optionality
6m SPX>RTY 3% outperformance calls for 3.24% (72 correl bid, ref. 5071 & 1975)	16-Apr-24	3.24%	Oct-24	Trading a challenging environment for small caps
6m SPX>RTY 3% outperformance calls contingent on RTY up at expiry for 0.61% (81% discount to vanilla).	16-Apr-24	0.61%	Oct-24	Trading a challenging environment for small caps
Buy a Sep24 Dual digital that pays out if SX5E < 4600 (25d) & oil (COX4) > 94 (25d) for 5.6% indicatively (refs VGM4: 4900; COX4: 83, correl bid: -15%).	23-Apr-24	5.6%	Sep-24	Up to 18x payout in a potential Middle East escalation scenario or 65% off in a relief rally
Buy a Sep24 SX5E 105% (~30d) call contingent on EURUSD < 1.055 (33d) for 55bps indicatively, a ~65% discount vs vanilla call (vanilla ref 1.58%).	23-Apr-24	55 bps	Sep-24	Up to 18x payout in a potential Middle East escalation scenario or 65% off in a relief rally
Buy a 13Dec24 NKY 105% call option contingent on JPY OIS 10y rates > ATMF+20bps at expiry for 1.32% (Correlation offer: -0.05, 63% discount to vanilla; indicative)	30-Apr-24	1.32%	13-Dec-24	Cheapen NKY upside by 63% as stocks can rally despite rates grinding higher
Buy SPX > RTY 6m 3% outperformance calls for 2.49% (spot ref: 5187.7, 2064.65)	7-May-24	2.49%	Nov-24	Safely capture large cap over small cap exposure in case of hawkish Fed
Buy SPX > RTY 6m ATM outperformance calls contingent on RTY up at expiry for 0.9% (76% discount to vanilla, spot ref: 5187.7, 2064.65).	7-May-24	0.9%	Nov-24	Safely capture large cap over small cap exposure in case of hawkish Fed
Long SX5E Sep24 97.5% put conditioned on EURUSD > 1.09 for 86bp (~60% discount vs vanilla put, EURUSD spot ref: 1.078).	7-May-24	86bps	Sep-24	60% off EU equity puts if the ECB isn't able to deliver cuts as fast as expected
Long SX5E Dec24 5425 (31d) call fully funded by selling a Dec25 168 (38d) call on the DED25 div future (spot refs: DED25: 163.7; SX5E: 5077.08)	14-May-24	0	Dec-24	SX5E upside at 0 cost by fading toppish dividends via long/short equity/div call RV
Short a SX5E Jun26 call ratio -1x 5100 (50d) +2x5600 (35d) for 42bps (spot ref: 5016, net delta: +0.21, net vega: €25) with the intention of unwinding early (say in 6m)	04-Jun-24	42bps	Dec24	Own SX5E vega cheaply with vol at 2 decade lows via short call ratios
Buy XLI 105% Dec24 call contingent on TLT < 97% at expiry for 1.65% (42% discount to vanilla, -0.10 correl bid, ref. 122.71, 90.89).	10-Jun-24	1.65%	20-Dec-24	Cheapen cyclical upside by conditioning on higher rates

**Table 1: Summary of open trades as of 16-Sep-24**

Summary of open trades as of 16-Sep-24

Trade Description	Open Date	Open Level	Expected Trade Term	Rationale
Buy EFA 103% Sep24 calls contingent on EURUSD < ATMs for 47bps (65% discount to vanilla, +0.33 correl bid, ref. 81.17, 1.0755)	10-Jun-24	47bps	20-Sep-24	Position for non-US equity rally cheapened by weaker EUR on the back of rest of the world cutting while Fed remains on hold.
Buy RTY < 95%, TLT > 105% Dec24 dual digital for 10.5% (9.5x max payout, 0 correl bid, ref. 2031.61, 90.89)	10-Jun-24	10.5%	20-Dec-24	Fade rally using small caps down, rates down dual digitals, which take advantage of correlation at 25yr extremes.
Buy SPW > SPX Sep24 ATM outperformance call for 1.75% offer (+80 correl bid, ref. 6725.85, 5447.87)	24-Jun-24	1.75%	Sep24	Hedge against rotation away from tech into rest of the market with limited risk.
Buy SPW > SPX Sep24 ATM outperformance call contingent on SPX > 100% at expiry for 0.87% offer (50% discount to unconditional, +80 correl bid, ref. 6725.85, 5447.87)	24-Jun-24	0.87%	Sep24	Hedge against rotation away from tech into rest of the market with limited risk.
Buy 12-Dec-24 110% 130% call spreads on a basket of strong momentum Asia Tech names for 3.7%. 5.4x max payout ratio (indic. quanto USD, equal weighted basket of 3690 HK / 2330 TT / 000660 KS)	24-Jun-24	3.7%	12-Dec-24	5.4x payout call spreads for risk-limited upside to cheap and soaring Asia Tech
Sell 1x KOSPI2 3-month 105% call against 1x NDX 3-month 105% call for 0.04% (both strikes 105% of fwd, indic. NDX delta 27.9%, KOSPI2 delta 27.6%, both 15.4% vol; fwd refs: 396.58 & 20.711)	9-Jul-24	0.04%	Oct-24	Nasdaq v Kospi calls: zero cost despite 2x Nasdaq up-beta
Buy NKY 13-Sep-24 42,500 44,000 1x1.5 call ratios for JPY 236 (-0.57% of spot; +1x 42.5k calls, -1.5x 44k calls; 8% delta and 6.3x-to-1 max payout ratio; vols: 16.6% 16.3%; spot ref: 41,190)	16-Jul-24	0.57%	Sep-24	In case a renewed NKY rally catches up with SPX: 6.3x max payout call ratios
Buy 12-Jun-25 85%/65% Best of Put spreads on NKY/KOSPI2/ SXSE/SPX for 0.50% (indic. quanto USD, 64% discount to avg vanilla, 40x max payout ratio)	16-Jul-24	0.50%	Jun-25	Taiwan risk: Unlikely but high impact; low-cost tail hedge for 40x max payout
Long Dec24 SX7E (EZ Banks) vs SX6P (EU Utils) 102.5% outperformance option, contingent on the SX7E up at expiry, for 3.48%	22-Jul-24	3.48%	Dec-24	European Banks vs Utilities outperformance attractive
Long SXSE Sep24 €4700 put (30d, ref: €4815.4) for 1.25%, sell RSP Sep24 \$166 put (30d ref: \$170.2) for 1.06%	29-Jul-24	1.25%/1.06%	Sep24	Europe vs US option RV attractive whether rotation continues or not
Sell KOSPI2 12-Sep-24 350 365 390 PSC for a KRW 0.48 debit (-0.13% of spot. Spot ref: 374.20, 45% delta, 19.1v/17.9v/16.2v) +1x 350 strike / -1x 365 strike / +390 strike	29-Jul-24	0.48 debit	12-Sep-24	Limited-risk way to buy the Kospi dip; 21x in case we rally back to July highs
Long SXSE Sep24 €4700 put (30d, ref: €4815.4) for 1.25%, sell RSP Sep24 \$166 put (30d ref: \$170.2) for 1.06%	30-Jul-24	1.06%	Sep-24	Europe vs US option RV attractive whether rotation continues or not
Buy VIX Sep 35/50/65 call fly (+1x/-2x/+1x) for -\$1 indicatively (theoretical mid pricing + bid-offer TBD at time of trade), -15x max payout ratio, UXU4 ref. 30.3911)	5-Aug-24	-\$1	Sep24	Leverage VIX curve backwardation to hedge a further rise in equity vol
Buy HYG Sep 75/72 put spread for \$0.24 indicatively (12.5x max payout ratio, -23D/11D strikes, ref. 77.22)	5-Aug-24	\$0.24	Sep24	Hedge macro risk with 12x payout HYG put spread
Buy QQQ Sep 480/500 call spread for \$3.12 indicatively (6.4x max payout ratio, -19D/8D, ref. 435.37)	5-Aug-24	\$3.12	Sep24	Buy-the-dip safely in case of a tech rebound using OTM QQQ call spreads
Buy SPX < 95% / 2y SOFR > ATMs + 25bps Dec24 dual digi for 8.25% indicatively (12.1x max payout ratio, +10 correl bid, ref. 5336.02, 3.8195)	12-Aug-24	8.25%	Dec24	Hedge a Fed that is cautious to cut and a return of equities fearing 'higher for longer'.
Long Dec24 FTSE 100 35d - 15d call spreads for 1.1% (4.1x max payout ratio, spot ref: 8168.10)	12-Aug-24	1.1%	Dec24	Low vol, 'Anti-Nasdaq' & defensive – more reasons for FTSE 100 upside
Sell NKY 13-Sep-24 105% calls and buy 13-Dec-24 105% 112% call spreads for 0.46% (indic. Spot ref: 35,609, vols: 27.5/22.6/20.9)	12-Aug-24	0.46%	13-Sep-24	NKY upside hedge 1: 15x payout by selling rich Sep calls to buy Dec call spreads
Buy NKY Dec-24 105% calls contingent on USDJPY > 105% for 1.63% (corresponds to 153.9 at a 146.6 JPY ref) (indic. 50% discount to vanilla @ 3.25%, 60 correl offer)	12-Aug-24	1.63%	Dec-24	NKY upside hedge 2: Cut the cost by half by avoiding to pay for unlikely upside
Buy SPX Oct24 5450-5250 put spread for \$25.8 indicatively (-31D/-17D strikes; 7.7x max payout ratio; ref. 5608.25)	19-Aug-24	\$25.8	Oct24	Leverage steep put skew to hedge equity downside.
Buy SPX < 99% / 2y SOFR > ATMs + 25bps Dec24 dual digital for 6.5% indicatively (15.3x max payout ratio, +9 correl bid, ESU4 ref. 5598.5, 2y SOFR spot ref. 3.85%)	19-Aug-24	6.5%	Dec24	Use favourable correlation to hedge against return of "higher for longer" fears.
Sell VIX Oct24 17 puts (-36D strike, UXV4 ref. 17.92) to buy SPX Dec24 5450-5000 put spreads (-34D/-14D strikes, ref. 5608.25). Sizing for zero cost is -2.2 SPX put spreads for every 100 VIX puts sold.	19-Aug-24	\$0	Oct24	Leverage election risk premium in VIX term structure to cheapen equity downside protection.
Buy KOSPI2 3-month 90-110 risk reversals for a 0.32% credit (indic. spot ref: 365.52, 30% delta, vols: 22.5% and 16.7%)- 1x KOSPI2 3m 90% put / +1x KOSPI2 3m 110% call	19-Aug-24	0.32%	Nov24	Kospi skew still steep – Attractive entry point for bullish risk reversals
Buy SXSE Jun25/Dec25 floating (110% of spot) FVA call for 1.1% (14v)	19-Aug-24	1.1%	Jun25	Leverage record-low SXSE forward-starting implied volatility.
Buy SXSE Mar25 35d-15d put spreads for 1.7% (5.5x max payout ratio)	19-Aug-24	1.7%	Mar25	Steep put skew offer cheap longer-dated downside protection in Europe if recessionary risks rise.
Buy SPX Oct24 5550-5300 put spread for \$37.3 indicatively (-34D/15D strikes, 6.7x max payout ratio; ref. 5625.80).	27-Aug-24	\$37.3	Oct24	Leverage steep put skew to hedge equity downside
Sell VIX Oct24 17 puts (-39D strike, UXV4 ref. 17.64) to buy SPX Oct24 5550-5300 put spreads (-34D/15D strikes; ref. 5625.80).	27-Aug-24	\$0	Oct24	Leverage election risk premium in VIX term structure to cheapen equity downside protection
Sizing for zero cost is -3.8 SPX put spreads for every 100 VIX puts sold.	27-Aug-24	\$0	Oct24	Leverage election risk premium in VIX term structure to cheapen equity downside protection
Buy SPX < 95% / 2y SOFR > ATMf + 25bps Dec24 dual digital for 5.85% indicatively (17x max payout ratio, +13 correl bid, ESU4 ref. 5625, 2y SOFR fwd ref. 3.41%)	27-Aug-24	5.85%	Dec24	Use favourable correlation to hedge against cuts getting priced out and equities pulling back.
Sell NIFTYM 26-Sep-24 24,000 24,500 25,700 26,200 Iron Condors for \$130 (-0.52% of spot or 6.7% p.a.; spot ref: 25,018) +1x 24,000 put / -1x 24,500 put / -1x 25,700 call / +1x 26,200 call	27-Aug-24	\$130	26-Sep-24	Nifty realising 2017 style low vol extremes – tactically harvest VRP via Condors
Consider long DAX Dec24 35d-15d put spreads for ~1.2% (spot ref: 18617.01)	27-Aug-24	1.2%	Dec-24	Downside protection: DAX put spreads offer near record high max payout ratios
Buy DAX Dec24 90% upvar at 14.0v (versus a fair variance ref of 16.8v).	27-Aug-24	14.0v	Dec-24	Hedge a risk in DAX volatility via long upvar into year-end
Short V2X Oct24 17 put and long V2X Dec24 15 put for +0.25v indicatively (V2X Oct24 & Dec24 refs: 18.45v and 16.95v, respectively)	4-Sep-24	+0.25v	Dec-24	V2X put calendars attractive to cheaply position for post US-election vol reset
Buy HSCIE 20-Dec-24 6,500 7,000 call spreads for \$108 (OOF Sep fut ref 6,167, 20 delta, Vols: 21.2% / 21.5%, 4.6x max payout)	4-Sep-24	\$108	20-Dec-24	Risk-limited China upside: Under-owned cheap diversifier
Buy SPX Oct24 5400-5150 put spread for \$46 indicatively (-36D/-16D strikes; 5.4x max payout ratio; ref. 5471.05)	9-Sep-24	\$46	Oct24	Leverage steeper skew to hedge near-term equity risk in a seasonally challenging environment
Buy SPX Oct24 5400-5200-5000 put fly (+1x/-2x/+1x) for \$21.3 indicative (-36D/-19D/-10D strikes; 9.3x max payout ratio; ref. 5471.05)	9-Sep-24	\$21.3	Oct24	Leverage steeper skew to hedge near-term equity risk in a seasonally challenging environment
Long SX7E Mar25 90% Upvar replication* for 19.8v (spot ref: 140.83)	9-Sep-24	19.8v	Mar25	Hedge growth risks to EZ banks efficiently via dividend RV & var replication
Replicate a NKY Dec25-Dec26 36.5K FVA straddle with a static strip of options at an implied FVA level of 18.6. To trade USS100k vega	9-Sep-24	18.6v	Dec26	Long discounted Nikkei vol: Fixed strike Dec-25/Dec-26 FVA straddles at 18.6%
Buy XLP Sep 83/81 put spread for \$0.40	16-Sep-24	\$0.40	Sep-24	Take advantage of relatively low implied vols to hedge or replace existing exposure with options ahead of FOMC rate decision
Buy XLU Oct 80 calls for \$0.65	16-Sep-24	\$0.65	Oct-24	Take advantage of relatively low implied vols to hedge or replace existing exposure with options ahead of FOMC rate decision
Buy SPX < 98% / 2y SOFR > ATMf + 25bps Dec24 dual digital for 9.1% indicatively (-11x max payout ratio, +16 correl bid, SPX spot ref. 5616, 2y SOFR fwd ref. 3.043%)	16-Sep-24	9.1%	Dec24	Hedge higher for longer fears with equity down rates up hybrid
Buy SPX < 98% / EURUSD < 99.6% Dec24 dual digital for 15.2% indicative (-6.6x max payout ratio, +20 correl offer, SPX spot ref. 5616, EURUSD spot ref. 1.11245)	16-Sep-24	15.2%	Dec24	Hedge higher for longer fears with equity down EUR down hybrid
Sell VIX Oct24 17 put to buy VIX Dec24 17 put for net cost of \$1.32 indicatively (UXV4 ref. 18.75, UXZ4 ref. 18.27).	16-Sep-24	\$1.32	Dec24	Use flat term structure via put calendars to hedge vol reset lower post-election
Buy VIX Dec24 17 / 14 put 1x2 (+1x / -2x) for \$1.27 indicatively (UXZ4 ref. 18.27).	16-Sep-24	\$1.27	Dec24	Use post-election vol floor to hedge post-event vol reset lower



**Table 1: Summary of open trades as of 16-Sep-24**  
Summary of open trades as of 16-Sep-24

Trade Description	Open Date	Open Level	Expected Trade Term	Rationale
Sell VIX Oct24 17 put to buy VIX Jan25 22-27 call spread for zero cost indicatively (UXV4 ref. 18.75, UXF5 ref. 18.71).	16-Sep-24	\$0	Jan25	Use pre-election risk premium to hedge post-election risk escalation
Buy 3x TWSE 20-Nov-24 23,500 calls and sell 1x 20-Nov-24 22,300 call for a total cost of TWS15 (~0.07% of spot, spot ref: 21,850) -1x 22,300 call: \$536, 42d, 19.9v / +3x 23,500 call: \$184, 19.4d, 19.1v	16-Sep-24	0.07%	20-Nov-24	TWSE rally hedge: 1x3 call ratios for 7bps ahead of TSMC earnings

**Source:** Bloomberg, BofA Global Research. Prices reflective of most recently available data which may be delayed in some cases. "Trade Value" represents current valuation of trades initiated on the "Open Date".

BofA GLOBAL RESEARCH



# Summary of Closed Trades (16-Sep-24)

**Table 2: Summary of closed trades as of 16-Sep-24**

Summary of closed trades as of 16-Sep-24

Trade Description	Open Date	Open Level	Close Level	Close Date	Rationale
Buy a Sep23 90% put on SX7E index contingent on 2Y EUR swap rates > ATMf + 25 bps for 1.87%, a ~60% discount vs vanilla puts	22-Feb-23	1.87%	0	15-Sep-23	Trade expired
Buy a Sep23 95% put on SX5E index contingent on EUR/USD < 1.025 for 1.68%, a ~60% discount vs vanilla puts	28-Feb-23	1.68%	0	15-Sep-23	Trade expired
Buy FTSE Sep23 100% UpVar offered at 11.4v (7.4v cheaper than Vanilla Var, spot ref: 7631.74)	03-Apr-23	11.4v	16.2v	15-Sep-23	Trade expired ITM
Replace outright SXDP longs with Sep23 call spreads	17-Apr-23	1%	0	15-Sep-23	Trade expired
Buy 1.3x SXDP Sep23 45d-30d call spread, fully funded by the sale of a SX7E 20d call (ref price: SXDP: 1079.07, SX7E: 108.18)	17-Apr-23	0	0	15-Sep-23	Trade expired
Buy Sep23 1.3 FTSE 30D puts, funded by a Sep23 SX7E 30D call	17-Apr-23	0	0	15-Sep-23	Trade expired
Buy SX7E Sep-23 35D-15D put spreads on SX7E for 1.4% and a maximum payout ratio of almost 5x (ref 113.91)	01-Aug-23	1.4%	0	15-Sep-23	Trade expired
Sell USD 6m2y ATMf+-50bp strangles to fully fund NDX Sep 11500 puts (28 puts per \$100m rates notional; ref. 3.66% fwd, 12562.61)	20-Mar-23	0%	-4.25%	23-Sep	NDX put expired OTM and short payer expired ITM
Buy RTY over NDX Sep 103% outperf. call for 2.7% (85 correl; ref. 1744.99, 12562.61)	20-Mar-23	2.70%	0%	23-Sep	Trade expired
Buy Sep SPX < 92% GLD > 103.5% dual digital for 10% (10x max payout; 0 correl bid, ref. 3982.24, 181.92)	27-Mar-23	10%	0%	23-Sep	Trade expired
Buy Sep RTY > 1935 (+7%) / EURUSD < 1.055 (-1.5%) dual digital for 10% offer (16 correl bid, 10x max payout; ref. 1830/1.0684)	5-Jun-23	10%	0%	23-Sep	Trade expired
Buy KOSPI2 3-month 90% puts for 0.40% (indic. -10 delta)	21-Jun-2023	0.4%	0%	Sep-23	Trade expired
KOSPI2 14 Sep 23 1x3 97% 92% put ratios for a 0.04% credit (indic. -1x 97% puts +3x 92% puts, -2% delta, spot ref: 330.84)	11-Jul-23	0.04% credit	0%	14-Sep-23	Trade expired
Sell an HSCEI 15-Sep-23 +1x/-1x/-1x/+2.5x 5,600 6,000 6,900 7,300 "upside-hedged iron condor" for HK\$33.3 (~0.52% or 11.1% ann.) (Options on futures, spot ref: 6,454, fut ref 6,458, 8d)	30-Aug-23	HK\$33.3	0	15-Sep-23	Trade expired
Buy XIN9I 28-Sep-23 105% calls with 29-Jun-23 window knock out at 115% for 1.70% (indic. 65% discount to vanilla call)	06-Mar-23	1.7%	0	28-Sep-23	Trade expired
Buy XIN9I 28-Sep-23 105% calls with a Sep knock out at 125% for 1.48% (indic. 69% discount to vanilla call)	06-Mar-23	1.48%	0	28-Sep-23	Trade expired
Buy a 28-Sep-23 XIN9I 105% 115% call spread, contingent on a continuous 110% S&P knock-out for 1.10% (indic. A 33% discount vs vanilla call, costing 1.64%, max payout ratio of 9.1x)	31-May-23	1.1%	0	28-Sep-23	Trade expired
Buy XIN9I 27 Sep 23 103% 110% call spreads for 1.41% (indic. +1x 103% call -1x 110% call, 4.95x max payout, -22% delta, ref: 12,530)	11-Jul-23	1.41%	0	27-Sep-23	Trade expired
Buy a KOSPI2 12-Oct-23 97% put for 0.41% and consider selling a KOSPI2 14-Dec-23 108% call against it for near zero cost (0.01%, spot ref: 337.58, -33d, Exhibit 33); +1x KOSPI2 12-Oct-23 97% put for 0.41% (-20d, 12.76v)	12-Sep-23	0.01%	0	12-Oct-23	Trade expired
-1x KOSPI2 14-Dec-23 108% call for 0.40% (13d, 12.24v)					
Buy XLF Oct 36 calls for \$0.52 (ref. 34.58)	18-Jul-23	\$0.52	0	20-Oct-23	Trade expired
Buy XLF/XLB/XLI Oct ATM worst-of call for 2.56% (29% discount to avg. call, ref. 34.58, 83.32, 109.06)	18-Jul-23	2.56%	0	20-Oct-23	Trade expired
Buy VIX Oct 17/20 call spreads for \$0.56 (indicative mid-levels, ref. 16.1975 in the Oct VIX future)	3-Sep-23	\$0.56	\$1.37	18-Oct-23	Trade expired ITM
Sell an Oct23 40d SXPP put to fully fund 2.2x STOXX 600 (SXPP) Oct23 40d puts for zero premium (Ref: 556 and 466 respectively)	24-Jul-23	0%	16.2%	20-Oct-23	Trade expired ITM
Sell an HSCEI 20-Oct-23 +1x/-1x/-1x/+2.5x 5,300 5,800 6,700 7,200 "upside-hedged iron condor" for HK\$55 (~0.88% or 10.4% ann.)	19-Sep-23	HK\$55	0	20-Oct-23	Trade expired
Buy a SX7E Nov-23 EUR 115 call, contingent on 2Y EUR rates (EUSA2) <= 3.5% at expiry for 1.1%, a ~50% discount vs an outright call (spot refs: 110.63, 3.66% respectively).	06-Sep-23	1.1%	0%	Nov-23	Trade expired
Buy a SX5E Nov23 97.5%-90% put spread, fully funded by the sale of a 110% Mar24 call (spot ref: 4225), unwound by Nov23 expiry.	22-Aug-23	0%	-0.2%	Nov-23	Trade expired
Buying the VIX Nov 35/50 call spread for 1.75 (ref. VIX Nov future = 30.0988)	26-Sep-22	\$1.75	\$0.00	15-Nov-23	Trade expired
Buy NVDA 24Nov 520 calls for \$11.20 (25 delta, ref. 452.73)	10-Oct-23	\$11.20	\$0.00	24-Nov-23	Trade expired
Buy TSLA 17Nov 300 calls for \$4.85 (22 delta, ref. 259.67)	10-Oct-23	\$4.85	\$0.00	17-Nov-23	Trade expired
Buy QQQ Nov 360-350 put spread for \$2 (5x max payout, ref. 369.41)	17-Oct-23	\$2.00	\$0.00	17-Nov-23	Trade expired
Buy the VIX Nov 20-30 call spread for \$0.87 (indicative pricing ref. Nov VIX future = 17.9780)	17-Oct-23	\$0.87	\$0.00	15-Nov-23	Trade expired
Buy delta-hedged Dec23 NKY vs KOSPI2 ATM straddles at 1.0%	22-Nov-22	1.0%	0%	Dec-23	Trade expired
Buy delta-hedged Dec23 NKY vs KOSPI2 ATMf straddles at 0.8% (indic. Long NKY Dec23 ATMf straddle at 18.0%; short KOSPI2 Dec23 ATMf straddle at 17.2%)	23-Jan-23	0.8%	0.4%	Dec-23	Trade expired
Buy XIN9I 3-month 12,000 11,000 put spreads for 229 USD quanto (indic. Spot ref: 12,405, -22 delta, max payout 4.4x)	22-Aug-23	229	65	Nov-29	long payer expired ITM
Buy NKY 8-Dec-23 103.5% 106.5% 1x1.5 call ratios for 0.38% +1x 103.5% calls and -1.5x 106.5% calls (see Exhibits 24 and 27) (indic. spot ref: 31,760, +3% delta, 16.7/16.2 vols, max payout 7.9x)	03-Oct-23	0.38%	0%	8-Dec-23	Trade expired
Fully fund 1.0x TWSE 1-month 97% put by selling 0.76x KOSPI2 1-month 97% puts for zero cost (indic. TWSE spot ref: 16,521, -24d, 15.3% vol; KOSPI2 spot ref: 318.94, -26d, 17.6% vol)	10-Oct-23	0%	0%	Nov-23	Trade expired
Sell an HSCEI 17-Nov-23 +1x/-1x/-1x/+2.5x 5,100 5,600 6,600 7,100 "upside-hedged iron condor" for HK\$56 (~0.92% or 10.5% ann.) (Options on futures, spot ref: 6,050, fut ref 6,055, 8d)	17-Oct-23	HK\$56	0	17-Nov-23	Trade expired
Sell a SXPP (Basic Resources) 3m (~Dec23) 30d put to fully fund 1.3x SXAP (Autos) 3m 30d puts for zero premium (ref. 517.47 and 605.97, respectively)	30-Aug-23	0%	0%	Dec-23	Trade expired
Buy FTSE Dec23 7650 calls with an initial offsetting short delta position on the underlying for 1.6% (ref spot: 7437.93).	06-Sep-23	1.6%	-1.1%	Dec-23	Trade expired
Consider hedging long EZ Bank div exposure via SX7E (~Dec23) 3m 30d-20d Put Spreads for 80bps.	19-Sep-23	80bps	0%	Dec-23	Trade expired
Overlay long Dec25 SX7E dividends (ref: 5.47) with a Dec23 40-20-25d (98-85-114 %) SX7E put spread collar (and pay 114bps of premium, ref: 104.37, N.B. this was corrected on 08-Jan-24)	23-May-23	-114bps	131bps	Dec-23	Trade expired
Buy a Dec23 85% SX5E put, funded by a Dec23 SX7E 120% call (both options are ~20 delta, ref 4164.64 and 97.56 respectively)	27-Mar-23	0%	-4.5%	Dec-23	Trade expired
ii) Long Dec23 S&P divs (ref: 66.2), & iii) +1x Dec23 S&P, -0.92x Dec23 ESTX50 divs (ref: 117.3)	23-Nov-21	66.2 -41.7	70.2 -61.6	Dec-23	Trade expired
ESTX50 Dec23-Dec24 3400 put FVA at 20.4v (spot ref: 3685, r: 1.4%, q: 2.6%) present an opportunity to buy volatility in Europe.	17-May-22	20.4v	23.4v	Dec-23	Trade expired
Buy a FTSE Dec23 5600 / 8200 skew lock for 3.3v (ref: 7920)	13-Feb-23	3.3v	11.9v	Dec-23	Trade expired
Buy SPX Dec23 3500-4800 collar (sell call, buy put) for 1.01% (ref. 4118.62)	1-Aug-22	1.01%	0	15-Dec-23	Trade expired
Buy an SPX Dec 23 3825-4800 collar (buy put, sell call) for zero upfront cost (ref. 4297.14)	15-Aug-22	0.00%	0	15-Dec-23	Trade expired
Buy RTY over NDX Dec 105% outperf. call for 2.6% (71 correl; ref. 1806.93, 14556.50)	5-Jun-23	2.60%	0	15-Dec-23	Trade expired
Buy Dec NDX <95% / USDJPY <141.1 dual digitals for 10% (17 correl offer, ref. 15360 & 146.47)	12-Sep-23	10%	0	15-Dec-23	Trade expired





**Table 2: Summary of closed trades as of 16-Sep-24**

Summary of closed trades as of 16-Sep-24

Trade Description	Open Date	Open Level	Close Level	Close Date	Rationale
Buy Dec FXI <95% / 10Y SOFR < 3.48% dual digitals for 10% (18 correl offer, ref. 27.20 & 3.99%)	12-Sep-23	10%	0	15-Dec-23	Trade expired
Buy NDX>107% / GLD>98.5% 29-Dec-23 dual digitals for 11.05% (ref. 15,047.12, 172.82; +6 indic. correl bid)	10-Oct-23	11.05%	0	29-Dec-23	Trade expired
Buy SPX DecQ 4025 puts for an indicative upfront cost of ~\$59 (1.4% of spot, -25 delta, 20.7% vol)	24-Oct-23	\$59	0	29-Dec-23	Trade expired
Buy RTY Dec23 103% call contingent on 2Y SOFR between ATMf & ATMf-40bps for 44bps. (70% discount to vanilla, +16 correl bid, ref. 1760.71 & 4.66%)	06-Nov-23	44bps	0	15-Dec-23	Trade expired
Sell HSCel 2m 1x3 102% 110% call ratios for 2.0%	22-Nov-22	2.0%	0	Dec-23	Trade expired
*Buy XIN9I 28-Dec-2023 12,000 11,200 put spreads for \$159 (indic. USD quanto, Spot ref: 12,574, -18 delta, max payout 5.0x)	26-Sep-23	\$159	\$800	28-Dec-23	Trade expired ITM
Buy XIN9I 28-Dec-2023 11,200 10,300 put spreads for \$160 (indic. USD quanto, Spot ref: 11,686)	24-Oct-23	\$160	\$900	28-Dec-23	Trade expired ITM
Finance KOSPI2 11-Jan-24 325 calls by selling KOSPI2 14-Dec-2023 280/300 put spreads and collect a KRW 0.11 credit (~0.03%)	31-Oct-23	0.03%	5.2%	14-Dec-23	long payer expired ITM
Nifty 28-Dec-23 20,300 20,900 1x2 call ratio costs \$86 (+1x 20,300 calls and -2x 20,900 calls; indic)	21-Nov-23	\$86	\$288	28-Dec-23	Trade expired ITM
Buy SPX Jan24 95% put contingent on 10Y SOFR > ATMf+15bps (ref. 4514.75 & 3.74%)	8-Aug-23	0.90%	0	19-Jan-24	Trade expired
Buy 1x GLD Jan24 220 call (135%, 18d), sell 2.6x as much notional in TIP Jan24 120 calls (113%, 18d) for zero cost (ref. 162.82, 106.00).	22-Nov-22	0%	0	19-Jan-24	Trade expired
Buy VSTOXX Feb24 30 calls for 1.1v or V2X Feb24 25-40 call spreads for 1.0v indicatively (max payout ratio of 15x, futures ref 18.2).	06-Nov-23	1.1v or 1.0v	0	16-Feb-24	Trade expired
Buy NKY 8-Mar-24 104% 110% call spreads for 0.95% (20% delta, 6.3-to-1 max payout ratio; vols: 18.45% 18.84%; spot ref: 36,022)	17-Jan-24	0.95%	6%	8-Mar-24	Trade expired ITM
Buy NKY 8-Mar-24 38,000 39,000 1x1.5 call ratios for JPY 113 (~0.30% of spot; +1x 38k calls, -1.5x 39k calls; 9% delta and 8.9-to-1 max payout ratio; vols: 16.50% 16.81%; spot ref: 36,897)	13-Feb-24	0.3%	1.8%	8-Mar-24	Trade expired ITM
Buy Mar24 volswap dispersion basket (vega-neutral) on a basket: MBG GY (34.66%), STLAM IM (25.45%), BMW GY (20.23%), VOW3 GY (14.83%), RNO FP (4.83%) and sell the SXAP volswap.	8-Aug-23	4.0v	5.3v	15-Mar-24	Trade expired ITM
Buy Mar24 40-delta strangles on EU-Banks (SX7E), Autos (SXAP), Basic Resources (SXPP) and Energy (SXEP) sectors, equally-weighted and partially fund them by the sale of a Mar24 50-delta straddle on the STOXX600 (SXPP) index, for a net indicative premium of 1.6%	31-Oct-23	1.6%	-6.0%	15-Mar-24	Trade expired
Buy a Dec23 95% mileage put on the SX5E with a vol-budget of 15% for 1.55%.	8-Aug-23	1.55%	0%	15-Mar-24	Trade expired
Buy SPX Mar24 4200 puts contingent on 2Y SOFR > 5% for \$32 (63% discount to vanilla put, 0 correl bid, ref. 4460 & 4.87%)	12-Sep-23	\$32	0	15-Mar-24	Trade expired
Buy SPX Mar24 4200 puts contingent on 2Y SOFR > 5% for \$53 (57% discount to vanilla put, indicative implied correl of 0%, ref. 4337.44 & 4.67%)	26-Sep-23	\$53	0	15-Mar-24	Trade expired
Buy SPX Mar24 105% call contingent on 2Y SOFR between ATMf & ATMf-50bps for 58bps (55% discount to vanilla, +10/+17 equity/rates correl bid/offer, ref. 4504 & 4.45%)	21-Nov-23	58bps	0	15-Mar-24	Trade expired
Trade 1: Buy a 14-Mar-24 NKY KOSPI2 ASS1 85% 65% Best of put spread for 0.77% (26x max payout, 49% discount to avg. vanilla puts)	10-May-23	0.77%/0.86%	0/0	14-Mar-24	Trade expired
Trade 2: Buy a 14-Mar-24 NKY KOSPI2 SX5E 85% 65% Best of put spread for 0.86% (23x max payout, 47% discount to avg. vanilla puts)					
Buy KOSPI2 14-Mar-24 310 345 360 call spread collars for KRW 1.96 (Short 1x put and long 1x call spread; 34% delta and 7.7x max payout ratio; vols: 18.35%, 15.80%, 15.39%; spot ref: 334.73)	17-Jan-24	KRW 1.96	KRW 15	14-Mar-24	Trade expired ITM
MarQ SPX 95% puts contingent on 2Y SOFR > ATMS+25bps for 35bps (51% disc. to vanilla, -4 correl bid, ref. 4697.24 & 4.25%)	9-Jan-23	35bps	0	28-Mar-24	Trade expired
MarQ 4500/4250 put spread for \$19.60 (approx. 95%/90% moneyness of spot; 18 delta/10 delta) for \$19.60 (12.8x max payout ratio)	9-Jan-23	\$19.60	0	28-Mar-24	Trade expired
Buy MarQ SPX > SX5E outperformance calls contingent on SPX < 100% qto USD for 1.05% indic. (50% discount vs unconditional, 70 correl bid, spot ref. 4851, 4480)	23-Jan-24	1.05%	0	28-Mar-24	Trade expired
Buy MarQ SPX > SX5E outperformance calls qto USD for 2.15% indic. (70 correl bid, spot ref. 4851, 4480)	23-Jan-24	2.15%	0	28-Mar-24	Trade expired
Buy IWM 12Apr 208-212 call spreads for \$0.86 (4.7x max payout, 30-15 delta, ref. 203.77)	5-Apr-24	\$0.86	0	12-Apr-24	Trade expired
Buy NKY 12-Apr-24 41,000 42,000 1x1.5 call ratios for JPY 107 (~0.27% of spot; +1x 41k calls, -1.5x 42k calls; 3% delta and 9.4x-to-1 max payout ratio; vols: 17.7% 17.9%; spot ref: 40,109)	5-Mar-24	0.27%	0	12-Apr-24	Trade expired
Long KospI2 and sell a 1-month 103% call option for 0.77% (~9.2% yield per annum, indic. spot ref: 361.31, 27% delta, 15.9 vol)	18-Mar-24	0.77%	0	11-Apr-24	Trade expired
Buy VSTOXX Apr24 18-25 call spread, part-funded by a Mar24 13 put for 0.73v indicatively (Apr24 fut ref: 16.7, Mar24 fut ref: 16.0).	09-Jan-23	0.73v	0.02v	17-Apr-24	Trade expired
Buy VIX Apr24 14.5 calls for \$0.89 (fwd ref. 14.45)	25-Mar-24	\$0.89	\$3.53	17-Apr-24	Trade expired ITM
Consider selling SX5E May24 -4900+4850 (1x2) put ratios and pay 74bps upfront (spot ref: 4935), hedged or unhedged.	23-Apr-24	74 bps	0	17-May-24	Trade expired
Buy IWM May 212-225 call spreads for \$3.34 (3.9x max payout, 40d-18d, ref. 205.24)	11-Mar-24	\$3.34	0	17-May-24	Trade expired
Buy IWM May 185-175 put spreads for \$1.11 (9x max payout, ref. 195.78)	16-Apr-24	\$1.11	0	17-May-24	Trade expired
Buy SPY May 510-525 call spreads for \$5	29-Apr-24	\$5.00	\$15.00	17-May-24	Trade expired ITM
Fully finance a NIFTY 30-May-24 22,500 call by selling a NIFTY 27-Jun-24 23,700 call (indic. +13% delta, vols: 13.0/18.7, spot ref: 22,004). Consider delta hedging	14-may-24	0	0.03%	30-May-24	Trade expired
Buy a 13-Jun-24 NKY KOSPI2 SX5E 90%-70% Best of put spread for 0.85% (qUSD, 24x max payout, 52% discount to avg. vanilla)	06-Nov-23	0.85%	0	13-Jun-24	Trade expired
Buy KOSPI2 Jun-24 variance against NKY variance at -4.25% KOSPI2 var offered at 18.10% vs NKY var bid at 22.35% (Indic. Sep fut refs: 346.00 and 32,670)	25-Jul-23	-4.25%	+1.63%	Jun-24	Trade expired
Long 1.5x SX7E Jun24 132 (50d) calls and short 1x Mar25 142.5 (40d) call for indicatively 0 upfront premium (spot ref: 135.69).	25-Mar-24	0	15.5%	Jun-24	Trade expired ITM
Consider Jun24 SX7E vs SX5E ATM outperformance, contingent on SX5E being up at expiry for 0.91%, a discount of 53% vs vanilla outperformance (spot ref: SX7E: 127.30, SX5E: 4925.73)	12-Mar-24	0.91%	0	Jun-24	Trade expired
Buy SX8P Jun24 900 calls for 2.3% (33d, 19v; Mar fut ref: 848)	21-Feb-24	2.3%	0	Jun-24	Trade expired
Replicate an SX7E Jun24 varswap at 24.8v with just 5 puts and 5 calls with strikes ranging from €70 to €135 (~10d, SX7E ref: 104.37).	23-May-23	24.8v	16.6v	Jun-24	Trade expired
Long SX5E Jun24 90% put (20d) for 1.7% (ref: 4340), short iTraxx Main S40 5y CDS at 69bp. Credit/equity notional =1.61x (8.1x delta-adjusted). Sizing such that CDS carry & roll P&L in 6m funds ~65% of the equity put premium.	21-Nov-23	1.7%	9 bps	Jun-24	Trade expired
Sell 1x Jun24 4850 call, buy 1.5x Aug23 4425 calls	11-Jul-23	\$0.40 credit	-\$118.37	18-Aug-23	Trade exited at Aug23 expiry
Buy a Jun24 Mag7 40D equal-weight basket of calls (AAPL @ 205, MSFT @ 430, NVDA @ 700, AMZN @ 175, META @ 435, GOOGL @ 165 and TSLA @ 215, equal notional) for 5.18% offer (spot refs. 191.73, 409.72, 624.65, 161.26, 401.02, 153.51, 190.93)	29-Jan-24	5.18%	18.55%	21-Jun-24	Trade expired ITM
Buy a Jun24 Mag7 40D equal-weight basket of calls (see Trade #1), sell an equal notional of Jun24 XLK 215 calls for 2.92% (40D equiv. strike on XLK, spot ref. 203.60)	29-Jan-24	2.92%	12.09%	21-Jun-24	Trade expired ITM
Buy Jun24 QQQ 450 calls, sell an equal notional of IWM Jun24 210-220 call spreads for 1.36% (40D equiv. strike on QQQ, 40D-25D equiv. strikes on IWM, spot refs. 428.15, 199.36)	29-Jan-24	1.36%	7.05%	21-Jun-24	Trade expired ITM
Buy SMH Jun24 110%/130%/150% call fly (+1x/-2x/+1x) for 2.24% (spot ref. 210.35)	26-Feb-24	2.24%	15.93%	21-Jun-24	Trade expired ITM

**Table 2: Summary of closed trades as of 16-Sep-24**

Summary of closed trades as of 16-Sep-24

Trade Description	Open Date	Open Level	Close Level	Close Date	Rationale
Buy NVDA Jun24 105% calls contingent on 2y SOFR > ATMS for 5.95% (37% discount to vanilla, ref. 785, 4.56%, +0.2 correl offer). Risk limited to upfront premium paid.	26-Feb-24	5.95%	49.12%	21-Jun-24	Trade expired ITM
Buy HYG Jun 75-72 put spreads for \$0.36 (8x max payout, 25d-6d, ref. 77.34)	11-Mar-24	\$0.36	0	21-Jun-24	Trade expired
Buy IWM Jun ATM call contingent on 10Y SOFR between ATMf-ATMf+50bps for 2.25% (54% disc. vs vanilla call, 15 correl offer, ref. 205.24, 3.673%)	11-Mar-24	2.25%	0	21-Jun-24	Trade expired
Buy IWM over QQQ Jun-24 3% outperf. call for 2.43% (+55 correl bid, ref. 201.96 & 438.71)	18-Mar-24	2.43%	0	21-Jun-24	Trade expired
Buy SPX Jun24 5050 puts (~25D strike) for \$55.20, with an initial offsetting long delta position on the underlying index (spot ref. 5218.19).	25-Mar-24	\$55.20	\$61.61	21-Jun-24	Trade expired ITM
Buy XLE Jun 100-105 calls for 0.66% (4.6x max payout, 34-15 delta, ref. 95.59)	22-Apr-24	0.66%	0	21-Jun-24	Trade expired
Buy USO Jun 85-90 call spread for \$0.91 (5.5x max payout, 30-15 delta, ref. 78.78)	22-Apr-24	\$0.91	0	21-Jun-24	Trade expired
Buy QQQ Jun 445/470 call spread for \$6.39 (3.9x max payout, 40-10 delta, ref. 432.75)	30-Apr-24	\$6.39	\$25	21-Jun-24	Trade expired ITM
Buy SMH Jun 230/240/250 call fly (+1x/-2x/+1x) for \$1.29 (7.8x max payout, 38-25-15 delta, ref. 218.38)	30-Apr-24	\$1.29	0	21-Jun-24	Trade expired
Buy HYG Jun 76-73 put spreads for \$0.30 (~25D-5D strikes, 10x max payout ratio, spot ref 77.1).	7-May-24	\$0.30	0	21-Jun-24	Trade expired
Buy VIX Jun 15.5-20 call spreads for \$0.57 (7.9x max payout ratio, futures ref. 14.71).	7-May-24	\$0.57	0	18-Jun-24	Trade expired
Buy HSCEI 21-Jun 6,500 calls funded by selling 5,200/5,700 put spreads for HK\$103 (~1.64% of spot) (Indicative, 49% delta, Options on Futures [OOF], May fut ref: 6,292)	30-Apr-24	HK\$103	0	21-Jun-24	Trade expired
Buy HSCEI 21-Jun 6,800 calls funded by selling 5,500/6,000 put spreads for HK\$72.7 (~1.11% of spot) (Indicative, 46% delta, Options on Futures [OOF], May fut ref: 6,536)	7-May-24	HK\$72.7	0	21-Jun-24	Trade expired
Buy NVDA Sep24 840 calls for \$97.30 with an initial partially offsetting short delta position on the underlying stock (spot ref. 790.92).	26-Feb-24	\$97.30	\$263.66	8-Jul-24	Trade exited early at a profit
Buy a 20-Sep-24 105% Worst of Call (WoC) on 5 global AI-linked stocks for 2.05% (qUSD, 76% discount to avg. vanilla call): NVIDIA (US), ASML (EU), TSMC (Taiwan), Samsung Elec (Korea) and Tokyo Electron (Japan)	25-Mar-24	2.05%	TBD	9-Jul-24	Taking early profit
Buy KOSPI2 vs NKY Jun-24 delta-hedged ATM straddles at -2.82% (indic.)	25-Jul-23	-2.82%	+0.4%	Jun-24	Trade expired
KOSPI2 Jun24 ATM Straddles cost 10.85% (14.88 vol, spot ref 344.32)					
NKY Jun24 ATM Straddles cost 13.15% (17.70 vol, spot ref 32,701)	28-May-24	0.3%	1.3%	27-jun-24	Trade expired
Buy NIFTYM 27-Jun-2024 1x1.5 23,750 24,250 call ratio for 59					
Max payout ratio 8.5x; upside break-even at 25,191 (+10.1% from here) (indic. Spot ref: 22,888, 2.6% delta, -0.01% vega, 20.2/19.6% vols)	04-Jun-24	0.24%	0.2%	27-jun-24	Trade expired
Buy NIFTYM 27-Jun-2024 1x1.5 24,000 24,500 call ratio for 55					
Max payout ratio 9.1x; upside break-even at 25,445 (+9.4% from here) (indic. Spot ref: 23,264, 4.3% delta, -0.01% vega, 18.6/18.8% vols)	8-Apr-24	8%	0	25-Jun-24	Trade expired
COQ4 > 95.25 & EURUSD < 98.5%*spot 25-Jun-24 expiry dual digital for 8% indic. (12.5x max payout ratio, correl bid = -0.12, ref. 88.25, 1.0855)					
COQ4 > 95.25 & USDCAD > 101.5%*spot 25-Jun-24 expiry dual digital for 7.8% indic. (12.8x max payout ratio, correl offer = +0.05, ref. 88.25, 1.3575).	8-Apr-24	7.8%	0	25-Jun-24	Trade expired
Long V2X Jun24 20 call for €0.425 (Jun fut. ref: 14.55)	14-May-24	€0.425	0	16-Jul-24	Trade expired
Buy SPX 1y 95% put for indicatively 3.48% (ref. 4556.64)	25-Jul-23	3.48%	0	22-Jul-24	Trade expired
Buy SPX 1y 95-75% put spread for indicatively 2.44% (8.2x max payout, ref. 4556.64)	25-Jul-23	2.44%	0	22-Jul-24	Trade expired
GLD Jul 225-235 call spread for \$2.3 (4.3x max payout, ref. 216.5).	8-Apr-24	\$2.30	0	22-Jul-24	Trade expired
SLV Jul 27-30 call spread for 59c (5.1x max payout, ref. 25.4).	8-Apr-24	\$0.59	0	22-Jul-24	Trade expired
HYG Jul24 74-71 put spread for 30c (10x max payout, 25-delta/10-delta strikes, ref. 76.425).	11-Apr-24	30c	0	22-Jul-24	Trade expired
Buy VIX Jul 16/26 call spread for \$0.53 indicatively (~18.8x max payout ratio, ref. 14.3967 in UXN4).	24-Jun-24	~\$0.53	0	22-Jul-24	Trade expired
Sell 1x NKY 1y 95-75% put spread, buy 2x SPX 1y 95-75% put spreads for ~zero cost (ref. 32700.94 & 4556.64)	Jul-24	0	0	22-Jul-24	Trade expired
Buy HSCEI 19-Jul-24 6,600 / 6,900 / 7,200 call fly financed by selling a 5,700 put for a HK\$5 (-0.08%) -1x 5,700 put / +1x 6,600 call / -2x 6,900 calls / +1x 7,200 call (indic. OOF, June fut ref: 6,466, +18% delta, -0.1% vega)	19-Jul-24	HK\$5	0	22-Jul-24	Trade expired
Buy QQQ Aug24 455/440 put spread for \$3.36 (4.5x max payout ratio, ref. 463.9, ~34D/~16D strikes).	29-Jul-24	\$3.36	\$7.69	5-Aug-24	Trade exited early at a profit
Buy QQQ 5-Aug-24 490-500 call spread for \$2.78 indicatively (3.59x max payout, ~36D-16D strikes, ref. 482.32)	22-Jul-24	\$2.78	0	5-Aug-24	Trade expired
Sell 1x SPX 12m 110% call, buy 1x SPX 12m 90% put (ref. 4588.96)	1-Aug-23	\$7.62 credit	\$483 debit	16-Aug-24	Trade expired ITM
Sell 1x SPX 12m 110%-120% call spread, buy 1x SPX 12m 90% put (ref. 4588.96)	1-Aug-23	\$19.82	\$458 debit	16-Aug-24	Trade expired ITM
Buy SPX Aug24 5500-5300 put spread for \$30.8 indicatively (6.49x max payout, ~33D-11D strikes, ref. 5564.41).	22-Jul-24	\$3.63	0	16-Aug-24	Trade expired
Buy IWM (Russell 2000) Aug24 228/238 call 1x1.5 for \$1.78 (5.6x max payout ratio, ref. 222.06, ~35D/~13D strikes)	29-Jul-24	\$1.78	0	16-Aug-24	Trade expired
Buy 1x VIX Sep 25 put, sell 1x VIX Oct 25 put for zero upfront cost indicatively (UXU4 ref. 30.39111, UXV4 ref. 27.3048)	5-Aug-24	~\$0	\$1.20 credit	27-Aug-24	Trade exited early to monetize gains
Sell 1x KOSPI2 3-mothn 105% call against 1x NDX 3-month 105% call for zero cost (both 105% of forward) (Indic., both 28.5% delta & 15.8% vol; forward refs: 375.29 & 18,365)	7-May-24	0	0	8-Aug-24	Trade expired
Buy NKY 3-month 103% 110% call spreads funded by selling 95% 88% put spreads for 0.48% (spot ref: 39,070, +42% delta) +1x 103% call / -1x 110% call / -1x 92% put / +1x 85% put	21-May-24	0.48%	0	9-Aug-24	Trade expired
Buy 29-Aug NIFTYM "bullish condors" and collect \$149 (indic. listed, ~0.61% of spot, corresponding to 7.3% annualised yield)	22-Jul-24	\$149	0	29-Aug-24	Trade expired
+1x 22,800 put / -1x 23,800 put / -0.5x 25,500 call / +0.5x 26,500 call	25-Aug-24	\$1.81	\$10.00	6-Sep-24	Trade expired ITM
Buy SPY 6-Sep 555-545 put spreads for \$1.81 offer over 5x max payout, ref. 561.07					

**Source:** BofA Global Research. Prices reflective of most recently available data which may be delayed in some cases. "Trade Value" represents current valuation of trades initiated on the "Open Date"

BofA GLOBAL RESEARCH





## Options Risk Statement

### Potential Risk at Expiry & Options Limited Duration Risk

Unlike owning or shorting a stock, employing any listed options strategy is by definition governed by a finite duration. The most severe risks associated with general options trading are total loss of capital invested and delivery/assignment risk, all of which can occur in a short period.

### Investor suitability

The use of standardized options and other related derivatives instruments are considered unsuitable for many investors. Investors considering such strategies are encouraged to become familiar with the "Characteristics and Risks of Standardized Options" (an OCC authored white paper on options risks). U.S. investors should consult with a FINRA Registered Options Principal. For detailed information regarding the risks involved with investing in listed options, see the [Options Clearing Corporation's Characteristics and Risks of Standardized Options website](#).

## Analyst Certification

I, Benjamin Bowler, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

## Special Disclosures

BofA Securities is currently acting as financial advisor to Daimler Truck Holding AG in connection with the proposed business combination between its subsidiary Mitsubishi Fuso Truck and Bus Corporation and Hino Motors, Ltd., a subsidiary of Toyota Motor Corporation, which was announced on May 30, 2023. The proposed transaction is subject to approval by shareholders of Hino Motors, Ltd. This research report is not intended to (1) provide voting advice, (2) serve as an endorsement of the proposed transaction, or (3) result in the procurement, withholding or revocation of a proxy.

BofA Securities is currently acting as financial advisor to Zurich Insurance Group AG in connection with its proposed acquisition of AIG Travel from American International Group Inc, which was announced on June 26, 2024.

BofA Securities is currently acting as Financial Advisor to Braemar Hotels & Resorts Inc. on potential Activism Defense.

BofA Securities is currently acting as advisor to EQT AB in connection with its proposed acquisition of a stake in Acronis International GmbH, which was announced on August 7, 2024.

BofA Securities is currently acting as financial advisor to Audax Group LP in connection with its proposed sale of The Chartis Group LLC to Blackstone Inc, which was announced on August 14, 2024.



# Disclosures

## Important Disclosures

One or more analysts contributing to this report owns stock of the covered issuer: Taiwan Semi Mfg Co

BofAS or one of its affiliates acts as a market maker for the equity securities recommended in the report: ASML, Consumer SPDR ETF, Invesco QQQ ETF, iShares iBoxx \$ HYC, iShares Long UST, iShares-MSCI ETF, SAP, SPDR Industr ETF, SPDR Utilities ETF, Taiwan Semi Mfg Co.

BofAS or an affiliate was a manager of a public offering of securities of this issuer within the last 12 months: Allianz, Generali, State Street.

The issuer is or was, within the last 12 months, an investment banking client of BofAS and/or one or more of its affiliates: Allianz, BlackRock, BMW, Generali, Holcim, Invesco, Meituan, Mercedes-Benz, Partners Group, Samsung Electronics, SAP SE, Sika, SK Hynix, State Street, Swiss Re, Taiwan Semi Mfg Co, Zurich Insurance Grp.

BofAS or an affiliate has received compensation from the issuer for non-investment banking services or products within the past 12 months: Allianz, ASML, ASML, BlackRock, BMW, Generali, Holcim, Invesco, Meituan, Mercedes-Benz, NN, Partners Group, Samsung Electronics, SAP SE, Sika, SK Hynix, State Street, Swiss Re, Taiwan Semi Mfg Co, Zurich Insurance Grp.

The issuer is or was, within the last 12 months, a non-securities business client of BofAS and/or one or more of its affiliates: Allianz, ASML, ASML, BlackRock, BMW, Generali, Holcim, Invesco, Meituan, Mercedes-Benz, NN, Partners Group, Samsung Electronics, SAP SE, Sika, SK Hynix, State Street, Swiss Re, Taiwan Semi Mfg Co, Zurich Insurance Grp.

In the US, retail sales and/or distribution of this report may be made only in states where these securities are exempt from registration or have been qualified for sale: Allianz, ASML, BMW, Generali, Holcim, Meituan, Mercedes-Benz, NN, Partners Group, Samsung Electronics, Sika, SK Hynix, Swiss Re, Tokyo Electron, Zurich Insurance Grp.

BofAS or an affiliate has received compensation for investment banking services from this issuer within the past 12 months: Allianz, BlackRock, BMW, Generali, Holcim, Invesco, Meituan, Mercedes-Benz, Partners Group, SK Hynix, State Street, Swiss Re, Zurich Insurance Grp.

BofAS or an affiliate expects to receive or intends to seek compensation for investment banking services from this issuer or an affiliate of the issuer within the next three months: Allianz, BlackRock, BMW, Generali, Holcim, Invesco, Meituan, Mercedes-Benz, Partners Group, Samsung Electronics, SAP SE, Sika, SK Hynix, State Street, Swiss Re, Taiwan Semi Mfg Co, Zurich Insurance Grp.

BofAS together with its affiliates beneficially owns one percent or more of the common stock of this issuer. If this report was issued on or after the 9th day of the month, it reflects the ownership position on the last day of the previous month. Reports issued before the 9th day of a month reflect the ownership position at the end of the second month preceding the date of the report: ASML, Mercedes-Benz, NN.

BofAS together with its affiliates beneficially owns one percent or more of the shares of this fund. If this report was issued on or after the 9th day of the month, it reflects the ownership position on the last day of the previous month. Reports issued before the 9th day of the month reflect the ownership position at the end of the second month preceding the date of the report: Consumer SPDR ETF, Invesco QQQ ETF, iShares iBoxx \$ HYC, iShares Long UST, iShares-MSCI ETF, SPDR Industr ETF, SPDR Utilities ETF.

The country in which this issuer is organized has certain laws or regulations that limit or restrict ownership of the issuer's shares by nationals of other countries: Taiwan Semi Mfg Co.

BofAS or one of its affiliates is willing to sell to, or buy from, clients the common equity of the issuer on a principal basis: Allianz, ASML, BMW, Consumer SPDR ETF, Holcim, Invesco QQQ ETF, iShares iBoxx \$ HYC, iShares Long UST, iShares-MSCI ETF, Mercedes-Benz, NN, SAP, Sika, SPDR Industr ETF, SPDR Utilities ETF, Taiwan Semi Mfg Co, Zurich Insurance Grp.

The issuer is or was, within the last 12 months, a securities business client (non-investment banking) of BofAS and/or one or more of its affiliates: Allianz, ASML, BlackRock, BMW, Generali, Holcim, Invesco, Meituan, Mercedes-Benz, NN, Partners Group, Samsung Electronics, SAP SE, Sika, SK Hynix, State Street, Swiss Re, Taiwan Semi Mfg Co, Zurich Insurance Grp.

Due to the nature of the market for derivative securities, the issuers or securities recommended or discussed in this report are not continuously followed. Accordingly, investors must regard this report as providing stand-alone analysis and should not expect continuing analysis or additional reports relating to such issuers and/or securities.

Due to the nature of strategic analysis, the issuers or securities recommended or discussed in this report are not continuously followed. Accordingly, investors must regard this report as providing stand-alone analysis and should not expect continuing analysis or additional reports relating to such issuers and/or securities.

BofA Global Research personnel (including the analyst(s) responsible for this report) receive compensation based upon, among other factors, the overall profitability of Bank of America Corporation, including profits derived from investment banking. The analyst(s) responsible for this report may also receive compensation based upon, among other factors, the overall profitability of the Bank's sales and trading businesses relating to the class of securities or financial instruments for which such analyst is responsible.

BofAS and/or its affiliates participate in the creation and redemption of these ETFs and are an authorized participant for such ETFs: Consumer SPDR ETF, Invesco QQQ ETF, iShares iBoxx \$ HYC, iShares Long UST, iShares-MSCI ETF, SPDR Industr ETF, SPDR Utilities ETF

## Other Important Disclosures

The covered issuer and/or one or more of its affiliates holds 5% or more of the total issued share capital of Bank of America Corporation: BlackRock.

Prices are indicative and for information purposes only. Except as otherwise stated in the report, for any recommendation in relation to an equity security, the price referenced is the publicly traded price of the security as of close of business on the day prior to the date of the report or, if the report is published during intraday trading, the price referenced is indicative of the traded price as of the date and time of the report and in relation to a debt security (including equity preferred and CDS), prices are indicative as of the date and time of the report and are from various sources including BofA Securities trading desks.

The date and time of completion of the production of any recommendation in this report shall be the date and time of dissemination of this report as recorded in the report timestamp.

Recipients who are not institutional investors or market professionals should seek the advice of their independent financial advisor before considering information in this report in connection with any investment decision, or for a necessary explanation of its contents.

Officers of BofAS or one or more of its affiliates (other than research analysts) may have a financial interest in securities of the issuer(s) or in related investments.

Refer to [BofA Global Research policies relating to conflicts of interest](#).

**"BofA Securities" includes BofA Securities, Inc. ("BofAS") and its affiliates. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor if they have questions concerning this report or concerning the appropriateness of any investment idea described herein for such investor. "BofA Securities" is a global brand for BofA Global Research.**

**Information relating to Non-US affiliates of BofA Securities and Distribution of Affiliate Research Reports:**

BofAS and/or Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S") may in the future distribute, information of the following non-US affiliates in the US (short name: legal name, regulator): Merrill Lynch (South Africa): Merrill Lynch South Africa (Pty) Ltd., regulated by The Financial Service Board; MLI (UK): Merrill Lynch International, regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA); BofASE (France): BofA Securities Europe SA is authorized by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers (AMF). BofA Securities Europe SA ("BofASE") with registered address at 51, rue La Boétie, 75008 Paris is registered under no 842 602 690 RCS Paris. In accordance with the provisions of French Code Monétaire et Financier (Monetary and Financial Code), BofASE is an établissement de crédit et d'investissement (credit and investment institution) that is authorised and supervised by the European Central Bank and the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers. BofASE's share capital can be found at [www.bofam.com/BofASEdisclaimer](http://www.bofam.com/BofASEdisclaimer); BofA Europe (Milan): Bank of America Europe Designated Activity Company, Milan Branch, regulated by the Bank of Italy, the European Central Bank (ECB) and the Central Bank of Ireland (CBI); BofA Europe (Frankfurt): Bank of America Europe Designated Activity Company, Frankfurt Branch regulated by BaFin, the ECB and the CBI; BofA Europe (Madrid): Bank of America Europe Designated Activity Company, Sucursal en España, regulated by the Bank of Spain, the ECB and the CBI; Merrill Lynch (Australia): Merrill Lynch Equities (Australia) Limited, regulated by the Australian Securities and Investments Commission; Merrill Lynch (Hong Kong): Merrill Lynch (Asia Pacific) Limited, regulated by the Hong Kong Securities and Futures Commission (HKSF); Merrill Lynch (Singapore): Merrill Lynch (Singapore) Pte Ltd, regulated by the Monetary Authority of Singapore (MAS); Merrill Lynch (Canada): Merrill Lynch Canada Inc, regulated by the Canadian Investment Regulatory Organization; Merrill Lynch (Mexico): Merrill Lynch Mexico, SA de CV, Casa



de Bolsa, regulated by the Comisión Nacional Bancaria y de Valores; BofAS Japan: BofA Securities Japan Co., Ltd., regulated by the Financial Services Agency; Merrill Lynch (Seoul): Merrill Lynch International, LLC Seoul Branch, regulated by the Financial Supervisory Service; Merrill Lynch (Taiwan): Merrill Lynch Securities (Taiwan) Ltd., regulated by the Securities and Futures Bureau; BofAS India: BofA Securities India Limited, regulated by the Securities and Exchange Board of India (SEBI); Merrill Lynch (Israel): Merrill Lynch Israel Limited, regulated by Israel Securities Authority; Merrill Lynch (DIFC): Merrill Lynch International (DIFC Branch), regulated by the Dubai Financial Services Authority (DFSA); Merrill Lynch (Brazil): Merrill Lynch S.A. Corretora de Títulos e Valores Mobiliários, regulated by Comissão de Valores Mobiliários; Merrill Lynch KSA Company: Merrill Lynch Kingdom of Saudi Arabia Company, regulated by the Capital Market Authority. This information: has been approved for publication and is distributed in the United Kingdom (UK) to professional clients and eligible counterparties (as each is defined in the rules of the FCA and the PRA) by MLI (UK), which is authorized by the PRA and regulated by the FCA and the PRA - details about the extent of our regulation by the FCA and PRA are available from us on request; has been approved for publication and is distributed in the European Economic Area (EEA) by BofASE (France), which is authorized by the ACPR and regulated by the ACPR and the AMF; has been considered and distributed in Japan by BofAS Japan, a registered securities dealer under the Financial Instruments and Exchange Act in Japan, or its permitted affiliates; is issued and distributed in Hong Kong by Merrill Lynch (Hong Kong) which is regulated by HKSCF; is issued and distributed in Taiwan by Merrill Lynch (Taiwan); is issued and distributed in India by BofAS India; and is issued and distributed in Singapore to institutional investors and/or accredited investors (each as defined under the Financial Advisers Regulations) by Merrill Lynch (Singapore) (Company Registration No 198602883D). Merrill Lynch (Singapore) is regulated by MAS. Merrill Lynch Equities (Australia) Limited (ABN 65 006 276 795), AFS License 235132 (MLEA) distributes this information in Australia only to 'Wholesale' clients as defined by s.761G of the Corporations Act 2001. With the exception of Bank of America N.A., Australia Branch, neither MLEA nor any of its affiliates involved in preparing this information is an Authorised Deposit-Taking Institution under the Banking Act 1959 nor regulated by the Australian Prudential Regulation Authority. No approval is required for publication or distribution of this information in Brazil and its local distribution is by Merrill Lynch (Brazil) in accordance with applicable regulations. Merrill Lynch (DIFC) is authorized and regulated by the DFSA. Information prepared and issued by Merrill Lynch (DIFC) is done so in accordance with the requirements of the DFSA conduct of business rules. BofA Europe (Frankfurt) distributes this information in Germany and is regulated by BaFin, the ECB and the CBI. BofA Securities entities, including BofA Europe and BofASE (France), may outsource/delegate the marketing and/or provision of certain research services or aspects of research services to other branches or members of the BofA Securities group. You may be contacted by a different BofA Securities entity acting for and on behalf of your service provider where permitted by applicable law. This does not change your service provider. Please refer to the [Electronic Communications Disclaimers](#) for further information.

This information has been prepared and issued by BofAS and/or one or more of its non-US affiliates. The author(s) of this information may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so. BofAS and/or MLPF&S is the distributor of this information in the US and accepts full responsibility for information distributed to BofAS and/or MLPF&S clients in the US by its non-US affiliates. Any US person receiving this information and wishing to effect any transaction in any security discussed herein should do so through BofAS and/or MLPF&S and not such foreign affiliates. Hong Kong recipients of this information should contact Merrill Lynch (Asia Pacific) Limited in respect of any matters relating to dealing in securities or provision of specific advice on securities or any other matters arising from, or in connection with, this information. Singapore recipients of this information should contact Merrill Lynch (Singapore) Pte Ltd in respect of any matters arising from, or in connection with, this information. For clients that are not accredited investors, expert investors or institutional investors Merrill Lynch (Singapore) Pte Ltd accepts full responsibility for the contents of this information distributed to such clients in Singapore.

#### General Investment Related Disclosures:

Taiwan Readers: Neither the information nor any opinion expressed herein constitutes an offer or a solicitation of an offer to transact in any securities or other financial instrument. No part of this report may be used or reproduced or quoted in any manner whatsoever in Taiwan by the press or any other person without the express written consent of BofA Securities.

This document provides general information only, and has been prepared for, and is intended for general distribution to, BofA Securities clients. Neither the information nor any opinion expressed constitutes an offer or an invitation to make an offer, to buy or sell any securities or other financial instrument or any derivative related to such securities or instruments (e.g., options, futures, warrants, and contracts for differences). This document is not intended to provide personal investment advice and it does not take into account the specific investment objectives, financial situation and the particular needs of, and is not directed to, any specific person(s). This document and its content do not constitute, and should not be considered to constitute, investment advice for purposes of ERISA, the US tax code, the Investment Advisers Act or otherwise. Investors should seek financial advice regarding the appropriateness of investing in financial instruments and implementing investment strategies discussed or recommended in this document and should understand that statements regarding future prospects may not be realized. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or the information in the prospectus or other offering document issued in connection with such offering, and not on this document.

Securities and other financial instruments referred to herein, or recommended, offered or sold by BofA Securities, are not insured by the Federal Deposit Insurance Corporation and are not deposits or other obligations of any insured depository institution (including, Bank of America, N.A.). Investments in general and, derivatives, in particular, involve numerous risks, including, among others, market risk, counterparty default risk and liquidity risk. No security, financial instrument or derivative is suitable for all investors. Digital assets are extremely speculative, volatile and are largely unregulated. In some cases, securities and other financial instruments may be difficult to value or sell and reliable information about the value or risks related to the security or financial instrument may be difficult to obtain. Investors should note that income from such securities and other financial instruments, if any, may fluctuate and that price or value of such securities and instruments may rise or fall and, in some cases, investors may lose their entire principal investment. Past performance is not necessarily a guide to future performance. Levels and basis for taxation may change.

This report may contain a short-term trading idea or recommendation, which highlights a specific near-term catalyst or event impacting the issuer or the market that is anticipated to have a short-term price impact on the equity securities of the issuer. Short-term trading ideas and recommendations are different from and do not affect a stock's fundamental equity rating, which reflects both a longer term total return expectation and attractiveness for investment relative to other stocks within its Coverage Cluster. Short-term trading ideas and recommendations may be more or less positive than a stock's fundamental equity rating.

Futures and options are not appropriate for all investors. Such financial instruments may expire worthless. Before investing in futures or options, clients must receive the appropriate risk disclosure documents. Investment strategies explained in this report may not be appropriate at all times. Costs of such strategies do not include commission or margin expenses.

BofA Securities is aware that the implementation of the ideas expressed in this report may depend upon an investor's ability to "short" securities or other financial instruments and that such action may be limited by regulations prohibiting or restricting "shortselling" in many jurisdictions. Investors are urged to seek advice regarding the applicability of such regulations prior to executing any short idea contained in this report.

Foreign currency rates of exchange may adversely affect the value, price or income of any security or financial instrument mentioned herein. Investors in such securities and instruments, including ADRs, effectively assume currency risk.

BofAS or one of its affiliates is a regular issuer of traded financial instruments linked to securities that may have been recommended in this report. BofAS or one of its affiliates may, at any time, hold a trading position (long or short) in the securities and financial instruments discussed in this report.

BofA Securities, through business units other than BofA Global Research, may have issued and may in the future issue trading ideas or recommendations that are inconsistent with, and reach different conclusions from, the information presented herein. Such ideas or recommendations may reflect different time frames, assumptions, views and analytical methods of the persons who prepared them, and BofA Securities is under no obligation to ensure that such other trading ideas or recommendations are brought to the attention of any recipient of this information.

In the event that the recipient received this information pursuant to a contract between the recipient and BofAS for the provision of research services for a separate fee, and in connection therewith BofAS may be deemed to be acting as an investment adviser, such status relates, if at all, solely to the person with whom BofAS has contracted directly and does not extend beyond the delivery of this report (unless otherwise agreed specifically in writing by BofAS). If such recipient uses the services of BofAS in connection with the sale or purchase of a security referred to herein, BofAS may act as principal for its own account or as agent for another person. BofAS is and continues to act solely as a broker-dealer in connection with the execution of any transactions, including transactions in any securities referred to herein.

ETFs are redeemable only in Creation Unit size through an Authorized Participant and may not be individually redeemed. ETFs also are redeemable on an "in-kind" basis. The mechanism for creation and redemption of ETFs may be disrupted due to market conditions or otherwise.

The public trading price of an ETF may be different from its net asset value, and an ETF could trade at a premium or discount to its net asset value.

Investors in ETFs with international securities assume currency risk.

U.S. exchange-listed, open-end ETFs must be offered under and sold only pursuant to a prospectus. U.S. exchange-listed ETFs may not be marketed or sold in a number of non-U.S. jurisdictions and may not be suitable for all investors. Investors should consider the investment objectives, risks, charges and expenses of the ETF carefully before investing. The prospectus for the ETF contains this and other information about the ETF. Clients may obtain prospectuses for the ETFs mentioned in this report from the ETF distributor or their Merrill Global Wealth Management financial advisor. The prospectuses contain more complete and important information about the ETFs mentioned in this report and should be read carefully before investing.

"Standard & Poor's®", "S&P®", "S&P 500®", "Standard & Poor's 500", "500", "Standard & Poor's Depository Receipts®", "SPDRs®", "Select Sector SPDR" and "Select Sector Standard & Poor's Depository Receipts" are trademarks of The McGraw-Hill Companies, Inc. and have been licensed for use in connection with the listing and trading of Select Sector SPDRs on the AMEX. The

stocks included in each Select Sector Index (upon which the Select Sector SPDRs are based) were selected by the index compilation agent in consultation with S&P from the universe of companies represented by the S&P 500 Index. The composition and weightings of the stocks included in each Select Sector Index can be expected to differ from the composition and weighting of stock included in any similar S&P 500 sector index that is published and disseminated by S&P.

For clients in Wealth Management, to the extent that the securities referenced in this report are ETFs or CEFs, investors should note that (1) the views and ratings presented by BofA Global Research personnel may vary from those of other business units of BofA Securities, including the Due Diligence group within the Chief Investment Office of MLPF&S ("CIO Due Diligence"); and (2) the CIO Due Diligence review process is used to determine the availability of an ETF or CEF for purchase through the Wealth Management division of MLPF&S and its affiliates.

#### Copyright and General Information:

Copyright 2024 Bank of America Corporation. All rights reserved. IQDatabase® is a registered service mark of Bank of America Corporation. This information is prepared for the use of BofA Securities clients and may not be redistributed, retransmitted or disclosed, in whole or in part, or in any form or manner, without the express written consent of BofA Securities. BofA Global Research information is distributed simultaneously to internal and client websites and other portals by BofA Securities and is not publicly-available material. Any unauthorized use or disclosure is prohibited. Receipt and review of this information constitutes your agreement not to redistribute, retransmit, or disclose to others the contents, opinions, conclusion, or information contained herein (including any investment recommendations, estimates or price targets) without first obtaining express permission from an authorized officer of BofA Securities.

Materials prepared by BofA Global Research personnel are based on public information. Facts and views presented in this material have not been reviewed by, and may not reflect information known to, professionals in other business areas of BofA Securities, including investment banking personnel. BofA Securities has established information barriers between BofA Global Research and certain business groups. As a result, BofA Securities does not disclose certain client relationships with, or compensation received from, such issuers. To the extent this material discusses any legal proceeding or issues, it has not been prepared as nor is it intended to express any legal conclusion, opinion or advice. Investors should consult their own legal advisers as to issues of law relating to the subject matter of this material. BofA Global Research personnel's knowledge of legal proceedings in which any BofA Securities entity and/or its directors, officers and employees may be plaintiffs, defendants, co-defendants or co-plaintiffs with or involving issuers mentioned in this material is based on public information. Facts and views presented in this material that relate to any such proceedings have not been reviewed by, discussed with, and may not reflect information known to, professionals in other business areas of BofA Securities in connection with the legal proceedings or matters relevant to such proceedings.

This information has been prepared independently of any issuer of securities mentioned herein and not in connection with any proposed offering of securities or as agent of any issuer of any securities. None of BofAS any of its affiliates or their research analysts has any authority whatsoever to make any representation or warranty on behalf of the issuer(s). BofA Global Research policy prohibits research personnel from disclosing a recommendation, investment rating, or investment thesis for review by an issuer prior to the publication of a research report containing such rating, recommendation or investment thesis.

Any information relating to sustainability in this material is limited as discussed herein and is not intended to provide a comprehensive view on any sustainability claim with respect to any issuer or security.

Any information relating to the tax status of financial instruments discussed herein is not intended to provide tax advice or to be used by anyone to provide tax advice. Investors are urged to seek tax advice based on their particular circumstances from an independent tax professional.

The information herein (other than disclosure information relating to BofA Securities and its affiliates) was obtained from various sources and we do not guarantee its accuracy. This information may contain links to third-party websites. BofA Securities is not responsible for the content of any third-party website or any linked content contained in a third-party website. Content contained on such third-party websites is not part of this information and is not incorporated by reference. The inclusion of a link does not imply any endorsement by or any affiliation with BofA Securities. Access to any third-party website is at your own risk, and you should always review the terms and privacy policies at third-party websites before submitting any personal information to them. BofA Securities is not responsible for such terms and privacy policies and expressly disclaims any liability for them.

All opinions, projections and estimates constitute the judgment of the author as of the date of publication and are subject to change without notice. Prices also are subject to change without notice. BofA Securities is under no obligation to update this information and BofA Securities ability to publish information on the subject issuer(s) in the future is subject to applicable quiet periods. You should therefore assume that BofA Securities will not update any fact, circumstance or opinion contained herein.

Certain outstanding reports or investment opinions relating to securities, financial instruments and/or issuers may no longer be current. Always refer to the most recent research report relating to an issuer prior to making an investment decision.

In some cases, an issuer may be classified as Restricted or may be Under Review or Extended Review. In each case, investors should consider any investment opinion relating to such issuer (or its security and/or financial instruments) to be suspended or withdrawn and should not rely on the analyses and investment opinion(s) pertaining to such issuer (or its securities and/or financial instruments) nor should the analyses or opinion(s) be considered a solicitation of any kind. Sales persons and financial advisors affiliated with BofAS or any of its affiliates may not solicit purchases of securities or financial instruments that are Restricted or Under Review and may only solicit securities under Extended Review in accordance with firm policies.

Neither BofA Securities nor any officer or employee of BofA Securities accepts any liability whatsoever for any direct, indirect or consequential damages or losses arising from any use of this information.



# Research Analysts

**Benjamin Bowler**

Equity-Linked Analyst  
BofAS  
+1 415 676 3595  
[benjamin.bowler@bofa.com](mailto:benjamin.bowler@bofa.com)

**Abhinandan Deb >>**

Equity-Linked Analyst  
MLI (UK)  
+44 20 7995 7148  
[abhinandan.deb@bofa.com](mailto:abhinandan.deb@bofa.com)

**Nitin Saksena**

Equity-Linked Analyst  
BofAS  
+1 646 855 5480  
[nitin.saksena@bofa.com](mailto:nitin.saksena@bofa.com)

**Lars Naeckter >>**

Equity-Linked Analyst  
Merrill Lynch (DIFC)  
+852 3508 7669  
[lars.naeckter@bofa.com](mailto:lars.naeckter@bofa.com)

**Chintan Kotecha**

Equity-Linked Analyst  
BofAS  
+1 646 855 5478  
[chintan.kotecha@bofa.com](mailto:chintan.kotecha@bofa.com)

**Riddhi Prasad >>**

Equity-Linked Analyst  
MLI (UK)  
+44 20 7995-7852  
[riddhi.prasad@bofa.com](mailto:riddhi.prasad@bofa.com)

**Michael Youngworth, CFA**

CBs, Pfds & Derivs Strategist  
BofAS  
+1 646 855 6493  
[michael.youngworth@bofa.com](mailto:michael.youngworth@bofa.com)

**Gonzalo Asis**

Equity-Linked Analyst  
BofAS  
+1 347 331 7681  
[gonzalo.asis@bofa.com](mailto:gonzalo.asis@bofa.com)

**Vittoria Volta >>**

Equity-Linked Analyst  
BoFASE (France)  
+33 1 8770 0703  
[vittoria.volta@bofa.com](mailto:vittoria.volta@bofa.com)

**Robin Marin >>**

Equity-Linked Analyst  
BoFASE (France)  
+33 1 8770 0182  
[robin.marin@bofa.com](mailto:robin.marin@bofa.com)

**Rupert Ansbro >>**

Equity-Linked Analyst  
MLI (UK)  
+44 20 7995 3344  
[rupert.ansbro@bofa.com](mailto:rupert.ansbro@bofa.com)

**Christopher Cho >>**

Research Analyst  
MLI (UK)  
+44 20 7996 5945  
[christopher.cho@bofa.com](mailto:christopher.cho@bofa.com)

Trading ideas and investment strategies discussed herein may give rise to significant risk and are not suitable for all investors. Investors should have experience in relevant markets and the financial resources to absorb any losses arising from applying these ideas or strategies.

>> Employed by a non-US affiliate of BofAS and is not registered/qualified as a research analyst under the FINRA rules. Refer to "Other Important Disclosures" for information on certain BofA Securities entities that take responsibility for the information herein in particular jurisdictions.

