Cross Asset Volatility

Machine Learning Based Trade Recommendations

Global Equity Derivatives Strategy

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- The **CARV** model shifted to a more short vol lean for most assets, reflecting the extra event risks premium that's priced in now amid the upcoming CPI, FOMC and a potential tariff deadline. On the other side, the model has a neutral bias in NIFTY, and most defensive in Commodies and FX (Figure 3).
- Rates across the curve have dropped significantly over the past few days alongside the sharp equities sell-off, resulting in the rates/equity correlation increasing to -5% from last week's low (-24%). Several metrics on TLT also indicate a demand for treasuries as "safe havens" amid the significant uncertainty on tariff and geopolitics, including a record high call – put trading volume (97%-ile in 5Y), a steepening inverted skew (93%-ile), and a large exposure in investors' gamma positioning (75%-ile, Figure 2), for which we estimate their long gamma exposure peaks at a spot level of 95 (Figure 1). To hedge against growth shocks or a slowdown, we recently recommended **buying SPX downside contingent on a decline in the US 10-year treasury yield**, which allows investors to trade the negative correlation at an attractive level.
- Although investors are bidding up TLT upside, our **ETF RV** model doesn't find its implied elevated at this moment, suggesting there may still be room for further upside. Indeed, our Rates strategist recently lowered his rate forecast due to a worsening growth outlook, the expectation of higher-term premiums resulting from a shift in demand towards more price-sensitive investors, and the belief that the markets are likely to price in the potential for more aggressive easing, especially given the Fed's asymmetrically dovish stance. Our economists continue to forecast a collective 50bp easing in June and September. Therefore, we recommend **buying TLT upside** in the medium term. For example, **buy a May 16th $94/98 TLT call spread for ~0.6%**, indicatively (~5.7x leverage) (Figure 4).
- According to the **VarSwap** model (Figure 5), long China & EM vs. short US & EU var pairs are the mainstream among decompression trades, from the back-end of the curve. HSCEI upside skew remains in negative territory, indicating a sustained expectation of significant upside movements, though our Asian colleagues view it as overpriced. This could be attributed to, as they argued, the expectation of the AI optionality as the market enters a phase of application proliferation. We recommend using **call spreads in HSCEI** to express this view. A list of structures offering more than 5x max-return-to-cost potential can be found here.
- FX vols remain near the middle of the multi-month range, having experienced only limited spillover from the ongoing equities downturn. The **gamma** model **(Figure 3),** which held net long stance for the last few weeks, is now shifting, narrowing the list of longs this week. However, **the shift should be viewed in the context of largely unchanged realized vol expectations on one hand and a degree of premium build-up on the other.** The model continues to find EUR vols worth owning, while PLN vol is seen as a convincing sell,

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reinforcing the strategy of going **long EUR/USD ATM vs. short EUR/PLN ATM vol.** Additionally, CHF/JPY is now topping the short vol side, and we recommend to pair it with **long CAD/JPY ATM.** Although GBP/JPY screens as a better candidate for selling according to the model, considering the tariffs backdrop, we still prefer CAD/JPY due to the noise from both Canada and the risk-off sentiment in equities.

Figure 1: TLT gamma profile as of 3/10 close

From **investors**' side (dealers are on the opposite side)
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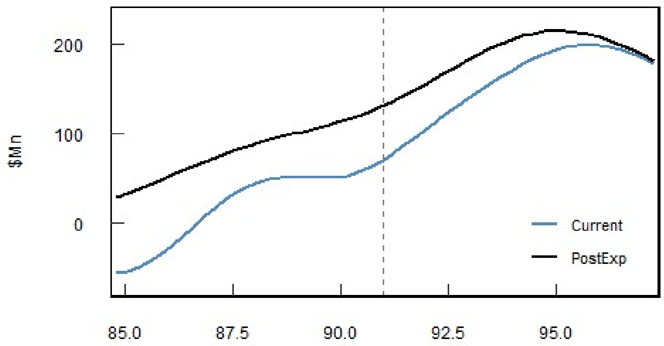
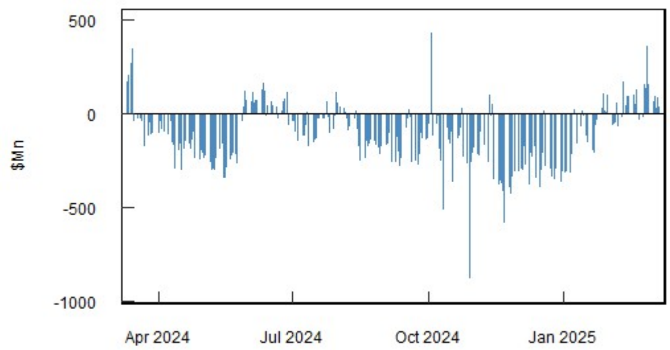


Source: J.P. Morgan

Figure 2: Investors turned to long TLT gamma imbalance



Source: J.P. Morgan

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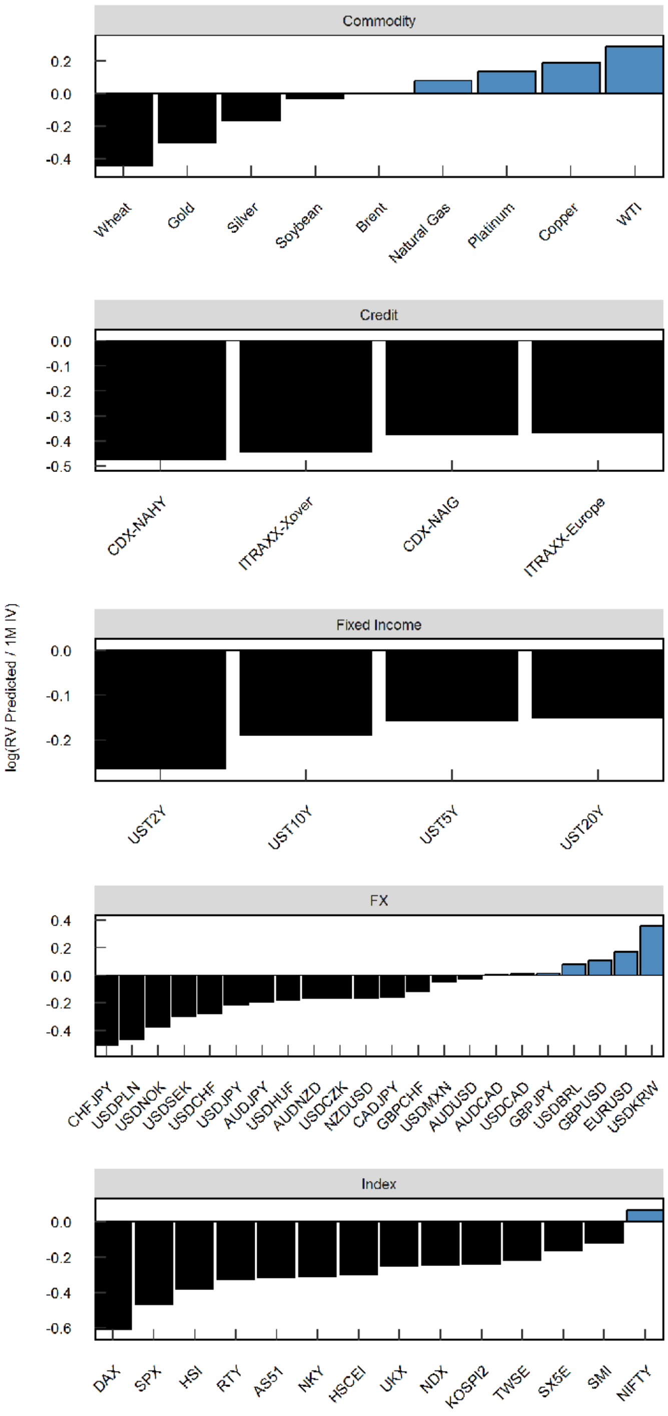
Cross Asset Relative Value (CARV) Volatility Ranking

Figure 3: Cross Asset Relative Value



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Top 15 Richness vol

	Asset	Name	RV Predicted	1M Implied	RV Rank
1	Index	DAX	12.3	22.5	1
2	FX	CHFJPY	6.1	10.1	2
3	Credit	CDX-NAHY	30.0	48.1	3
4	Index	SPX	13.9	22.2	4
5	FX	USDPLN	7.6	12.1	5
6	Credit	ITRAXX-Xover	29.5	46.0	6
7	Commodity	Wheat	19.9	31.0	7
8	Index	HSI	17.3	25.4	8
9	Credit	CDX-NAIG	37.2	54.1	9
10	FX	USDNOK	7.7	11.1	10
11	Credit	ITRAXX-Europe	34.1	49.3	11
12	Index	RTY	20.5	28.4	12
13	Index	AS51	9.9	13.6	13
14	Index	NKY	16.3	22.3	14
15	Commodity	Gold	11.4	15.4	15

Source: J.P. Morgan

Top 15 Cheapness vol

	Asset	Name	RV Predicted	1M Implied	RV Rank
1	FX	USDKRW	12.6	8.8	1
2	Commodity	WTI	41.5	31.0	2
3	Commodity	Copper	21.3	17.6	3
4	FX	EURUSD	10.3	8.7	4
5	Commodity	Platinum	21.3	18.6	5
6	FX	GBPUSD	9.0	8.1	6
7	Commodity	Natural Gas	71.5	66.0	7
8	FX	USDBRL	15.6	14.4	8
9	Index	NIFTY	14.5	13.5	9
10	FX	GBPJPY	12.1	12.0	10
11	FX	USDCAD	7.2	7.1	11
12	FX	AUDCAD	7.0	7.0	12
13	Commodity	Brent	28.9	28.9	13
14	FX	AUDUSD	9.8	10.1	14
15	Commodity	Soybean	17.1	17.5	15

Source: J.P. Morgan

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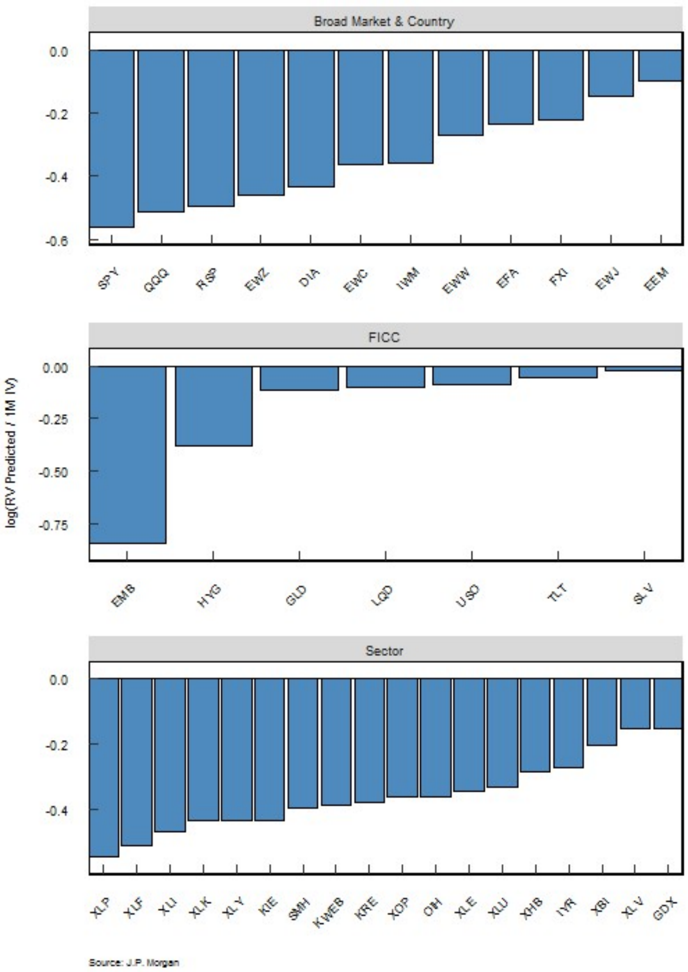
ETF Relative Value Volatility Rankings

Figure 4: ETFs Relative Value



Top 10 Richness vol

	Name	RV Predicted	1M Implied	RV Rank
1	EMB	6.5	15.1	1
2	SPY	13.3	23.4	2
3	XLP	10.8	18.7	3
4	QQQ	17.8	29.7	4
5	XLF	15.8	26.3	5
6	RSP	13.3	21.7	6
7	XLI	14.3	22.9	7
8	EWZ	24.4	38.7	8
9	DIA	13.1	20.2	9
10	XLK	21.2	32.7	10

Source: J.P. Morgan

Top 10 Cheapness vol

	Name	RV Predicted	1M Implied	RV Rank
1	SLV	25.5	26.1	1
2	TLT	14.7	15.5	2
3	USO	26.6	29.1	3
4	EEM	18.4	20.4	4
5	LQD	7.1	7.9	5
6	GLD	14.1	15.8	6
7	EWJ	16.8	19.4	7
8	GDX	30.8	35.8	8
9	XLV	13.9	16.2	9
10	XBI	27.3	33.4	10

Source: J.P. Morgan

Source: J.P. Morgan[1]

1. Investable AI for Volatility Trading: Introducing the New ETF RV Volatility Model, 22 Mar 2023
Investable AI for Volatility Trading: Deep Learning Model for Cross Asset Volatility Strategies, 11 Jan 2024

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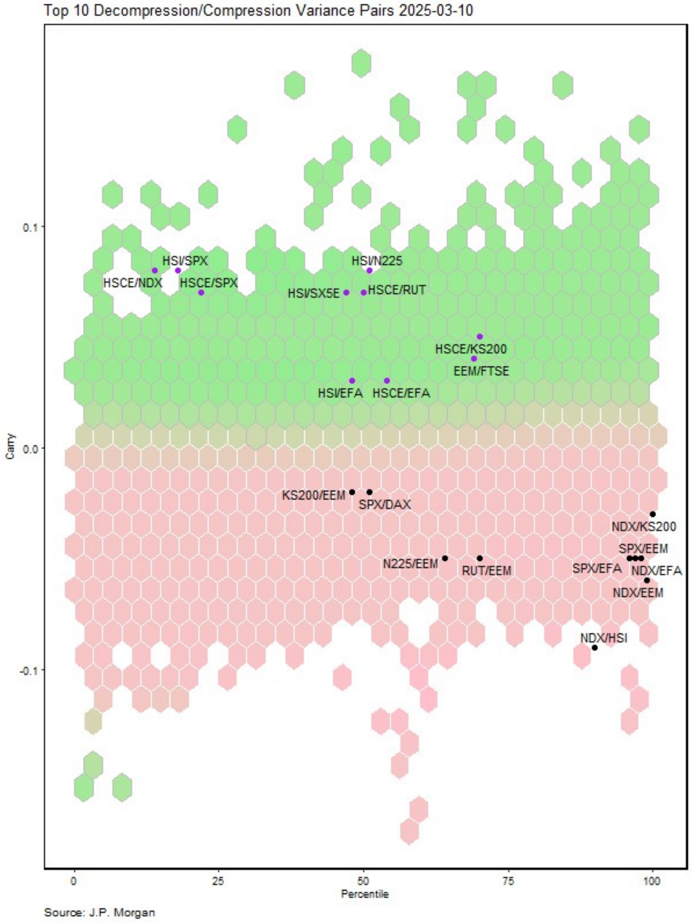
Equity Index 1Y Variance Swap Relative Value

Figure 5: Top 10 Decompression and Compression Variance Pairs



Top 10 Variance Pairs for Decompression

	Long	Short	Carry	IV Percentile(1 Year)	Predicted Hit Ratio
1	HSCE	SPX	0.07	22	1.00
2	HSI	SPX	0.08	18	1.00
3	HSCE	NDX	0.08	14	1.00
4	HSI	EFA	0.03	48	1.00
5	HSI	N225	0.08	51	1.00
6	HSCE	RUT	0.07	50	1.00
7	HSI	SX5E	0.07	47	0.99
8	HSCE	KS200	0.05	70	0.97
9	EEM	FTSE	0.04	69	0.97
10	HSCE	EFA	0.03	54	0.97

Source: J.P. Morgan

Top 10 Variance Pairs for Compression

	Long	Short	Carry	IV Percentile(1 Year)	Predicted Hit Ratio
1	NDX	EEM	-0.06	99	0.04
2	NDX	KS200	-0.03	100	0.04
3	KS200	EEM	-0.02	48	0.04
4	SPX	DAX	-0.02	51	0.04
5	N225	EEM	-0.05	64	0.04
6	NDX	EFA	-0.05	98	0.03
7	RUT	EEM	-0.05	70	0.03
8	SPX	EEM	-0.05	97	0.03
9	SPX	EFA	-0.05	96	0.03
10	NDX	HSI	-0.09	90	0.00

Source: J.P. Morgan

Source: J.P. Morgan[2]

2. Global Equity Derivatives: A simple machine learning approach to variance pairs trading, 24 July 2018; Big Data and AI Strategies: Attractive long/short variance pairs in a machine learning framework, 15 Aug 2018; Big Data and AI Strategies: Application of support vector machine to cross-asset volatility pair trading, 2 Oct 2018

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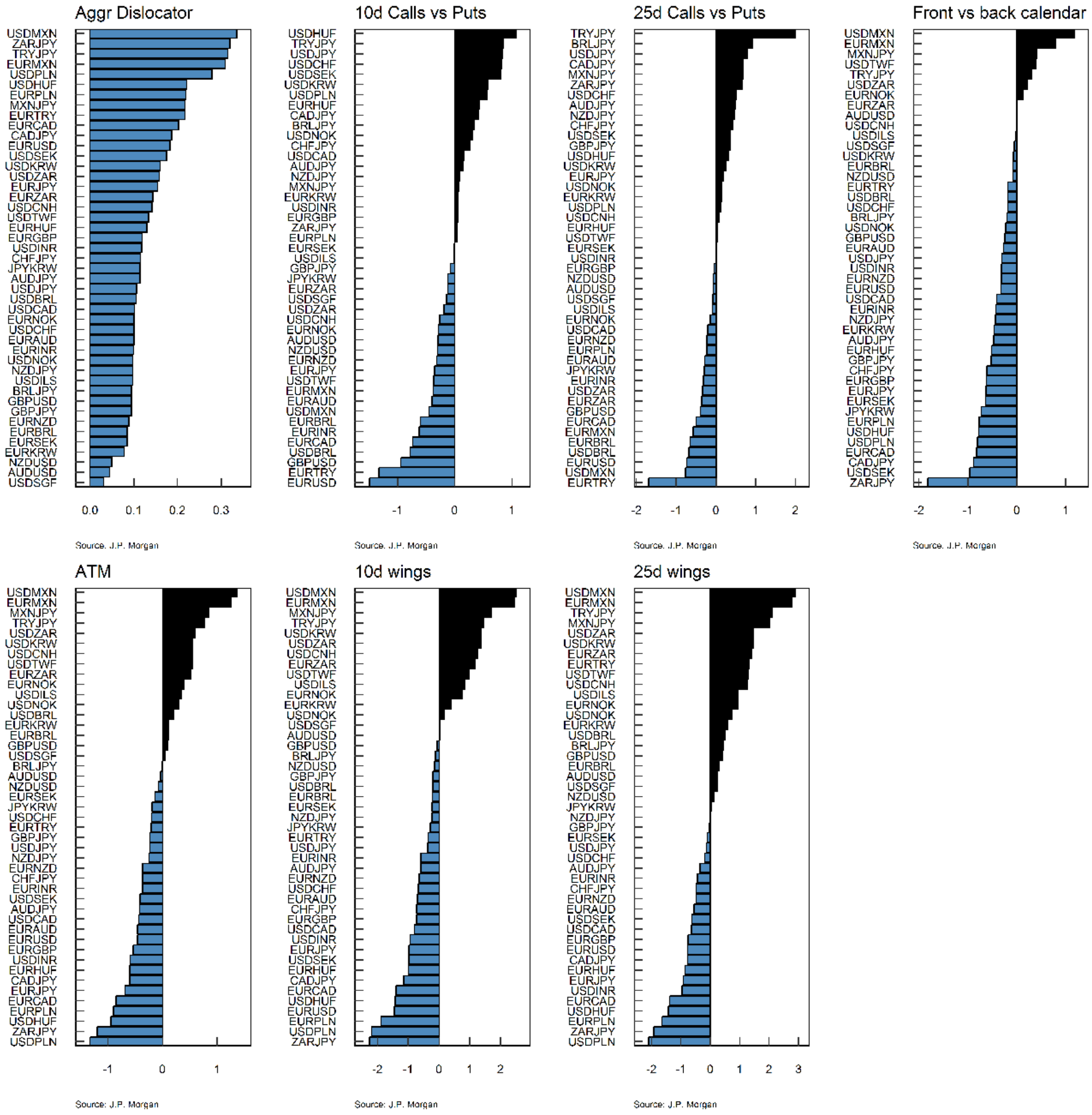
FX Volatility Surface Relative Value

Figure 6: Vol Surface dislocations across various tradable axes

Vol Points



Source: J.P. Morgan

3. FX Derivatives Research Note: Predicting and Trading the Volatility Surface, 5 Sep 2024

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Put Sale: Investors who sell put options will own the underlying asset if the asset's price falls below the strike price of the put option. Investors, therefore, will be exposed to any decline in the underlying asset's price below the strike potentially to zero, and they will not participate in any price appreciation in the underlying asset if the option expires unexercised.

Call Sale: Investors who sell uncovered call options have exposure on the upside that is theoretically unlimited.

Call Overwrite or Buywrite: Investors who sell call options against a long position in the underlying asset give up any appreciation in the underlying asset's price above the strike price of the call option, and they remain exposed to the downside of the underlying asset in the return for the receipt of the option premium.

Booster : In a sell-off, the maximum realized downside potential of a double-up booster is the net premium paid. In a rally, option losses are potentially unlimited as the investor is net short a call. When overlaid onto a long position in the underlying asset, upside losses are capped (as for a covered call), but downside losses are not.

Collar: Locks in the amount that can be realized at maturity to a range defined by the put and call strike. If the collar is not costless, investors risk losing 100% of the premium paid. Since investors are selling a call option, they give up any price appreciation in the underlying asset above the strike price of the call option.

Call Purchase: Options are a decaying asset, and investors risk losing 100% of the premium paid if the underlying asset's price is below the strike price of the call option.

Put Purchase: Options are a decaying asset, and investors risk losing 100% of the premium paid if the underlying asset's price is above the strike price of the put option.

Straddle or Strangle: The seller of a straddle or strangle is exposed to increases in the underlying asset's price above the call strike and declines in the underlying asset's price below the put strike. Since exposure on the upside is theoretically unlimited, investors who also own the underlying asset would have limited losses should the underlying asset rally. Covered writers are exposed to declines in the underlying asset position as well as any additional exposure should the underlying asset decline below the strike price of the put option. Having sold a covered call option, the investor gives up all appreciation in the underlying asset above the strike price of the call option.

Put Spread: The buyer of a put spread risks losing 100% of the premium paid. The buyer of higher-ratio put spread has unlimited downside below the lower strike (down to zero), dependent on the number of lower-struck puts sold. The maximum gain is limited to the spread between the two put strikes, when the underlying is at the lower strike. Investors who own the underlying asset will have downside protection between the higher-strike put and the lower-strike put. However, should the underlying asset's price fall below the strike price of the lower-strike put, investors regain exposure to the underlying asset, and this exposure is multiplied by the number of puts sold.

Call Spread: The buyer risks losing 100% of the premium paid. The gain is limited to the spread between the two strike prices. The seller of a call spread risks losing an amount equal to the spread between the two call strikes less the net premium received. By selling a covered call spread, the investor remains exposed to the downside of the underlying asset and gives up the spread between the two call strikes should the underlying asset rally.

Butterfly Spread: A butterfly spread consists of two spreads established simultaneously – one a bull spread and the other a bear spread. The resulting position is neutral, that is, the investor will profit if the underlying is stable. Butterfly spreads are established at a net debit. The maximum profit will occur at the middle strike price; the maximum loss is the net debit.

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