

Derivatives Quarterly

September 2021



Introduction

This quarterly publication highlights a range of derivative strategies suitable for institutional investors. While the focus will be on equity market protection, we will also highlight other more topical ideas. For example, in this issue we discuss a range of carbon market strategies. The three strategies provide opportunities to protect against the risk of higher carbon prices, access a unique return stream, or reduce the carbon intensity of a portfolio.

The strategies highlighted can be considered for a range of applications – dynamic asset allocation, equity replacement, or downside protection. We provide an overview of each strategy and highlight key considerations for each.

We cover three types of strategy.

Direct equity hedges... p. 3

Equity options can offer direct protection against both strength and weakness in the underlying index and are the standard way of implementing an equity hedge.

Indirect equity hedges... p. 7

These strategies aim to protect against equity market weakness by using derivatives on related asset classes rather than the underlying equity index. Indirect hedges can reduce cost but introduce a degree basis risk.

Carbon hedges... p. 11

These strategies aim to provide a hedge against the risk of higher carbon prices or reduce the carbon intensity of an investor's portfolio. We consider three overlay approaches: carbon offset emission futures, structured derivatives on carbon indices and overlay swaps.

We provide high level outlines of the strategies only. In some places we have included additional transactional detail, however, this is for illustrative purposes only. Actual transaction details will vary with objectives, constraints and market conditions. The trades discussed are not meant as recommendations.



Cross-Asset volatility landscape

Implied volatility has reduced over the past twelve months for equities, credit and FX markets. However, interest rate volatility has increased, along with yields, as the outlook for inflation creates uncertainty over future central bank policy.

Implied volatility across asset classes

	30/08/2021	Level			3mth change			12mth change			10yr percentile		
		3mth	6mth	1yr	3mth	6mth	1yr	3mth	6mth	1yr	3mth	6mth	1yr
Equity	S&P 500	14.37	16.55	17.94	-0.30	0.30	0.44	-9.38	-7.39	-4.82	52	64	69
	ASX 200	13.77	14.25	14.99	0.29	-0.11	-0.23	-5.99	-5.38	-4.30	57	57	56
	NIKKEI	17.92	18.17	18.07	0.56	0.32	0.07	-3.39	-2.37	-1.73	37	35	29
	STOXX50	14.52	15.75	16.05	-0.23	-0.14	-0.15	-9.27	-7.17	-4.48	25	30	28
	FTSE	13.65	14.60	14.76	0.15	-0.03	-0.29	-8.63	-6.73	-4.28	50	53	48
	NASDAQ	17.81	19.91	21.31	-2.36	-1.33	-0.46	-16.02	-11.92	-7.66	57	67	69
	VIX	90.66	72.35		5.69	-0.41		-8.69	-5.01		87	85	
FX	AUD.USD	8.66	8.86	9.15	-0.29	-0.38	-0.38	-1.88	-1.35	-0.90	34	32	27
	AUD.JPY	9.03	9.32	9.80	0.28	-0.07	-0.35	-1.49	-1.29	-1.01	16	13	12
	USD.JPY	5.50	5.80	6.15	-0.31	-0.38	-0.48	-2.87	-2.13	-1.56	3	2	1
	GBP.USD	6.43	6.74	7.09	-0.52	-0.54	-0.51	-2.88	-2.48	-2.11	11	11	8
	EUR.USD	5.34	5.44	5.77	-0.42	-0.48	-0.65	-2.71	-2.19	-1.60	8	5	3
Rates	AUD 10yr bps/pa	67.87	67.91	67.93	-0.41	-2.89	-6.40	14.18	13.56	12.33	38	36	36
	USD 10yr bps/pa	70.91	70.67	70.54	1.23	-0.93	-3.50	3.36	6.61	8.07	47	40	35
	JPY 10yr bps/pa	14.73	15.45	16.44	1.52	0.64	0.16	-4.99	-3.75	-2.44	11	10	7
Credit	CDX.NA.IG	0.93	1.00		-0.13	-0.19		-0.97	-0.95		6	6	
	ITraxx crossover	4.23	4.59		-0.52	-0.42		-2.93	-2.78		10	13	
Commod.	Gold	14.16	15.09	16.08	-0.08	-0.10	-0.20	-5.93	-4.59	-3.63	42	43	41
	Crude oil			32.47			1.14			4.01			58

As volatility is a key driver of derivative pricing, lower volatility means the cost of using derivatives as a portfolio hedging tool has reduced over the year. This also has coincided with a rise in many equity markets to record levels, which may increase the appetite from certain investors for downside protection.

Source: Citibank, Frontier

Direct equity hedges

Equity options can offer direct protection against both a rising or falling equity market. While options are commonly used to protect against market falls they can also be used to protect against a rising market for those investors underweight equities. Similarly, they can be used to take a directional view on equity markets without the need to transact in the underlying physical equity allocation.

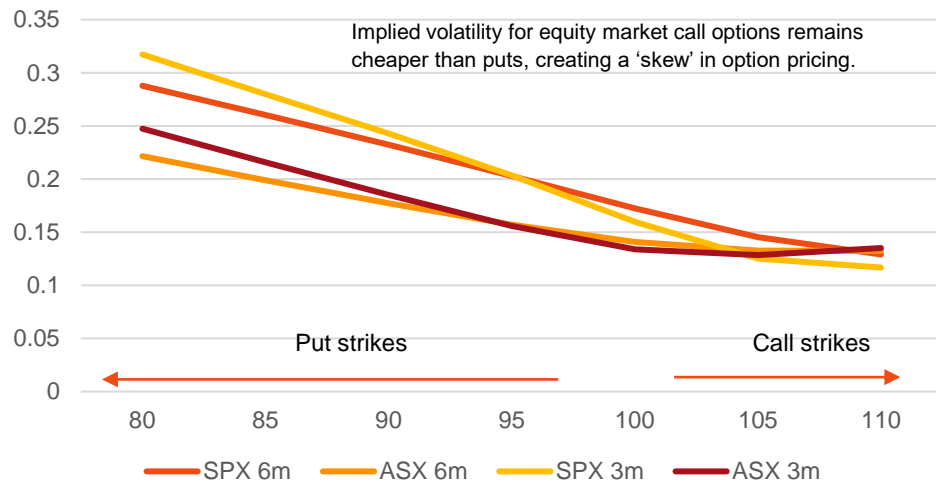
Key considerations when determining a suitable strategy include strike/moneyness, tenor and costs. We provide an overview of three different option strategies that may be suitable for providing portfolio protection or yield. The charts in the following pages are based on pricing as at 30/8/21.

Strategy	Scenario	Objective	Rationale	Trade example
A. Replace underlying equity exposure by buying equity index calls	Portfolio is overweight equities	Strategy protects against an equity market sell off.	Current call pricing is attractive relative to put pricing.	Sell the underlying equity exposure and purchase an equal notional of 105 index calls
B. Buying index put spreads	Portfolio is overweight equities	Strategy protects against an equity market sell off.	Put spreads provide protection against shallow equity market drawdowns. Whilst the level of protection is less than an outright put option, put spreads reduce the overall cost of the structure.	Buy 95 puts and sell an equal notional of 85 Puts
C. Call overwriting	Additional yield opportunity	Strategy earns option premium income.	The call writing strategy involves selling OTM call options linked to an equity index, where the seller earns the option premium as income.	Sell a 115 index call

A. Replacing underlying equities by buying equity index calls

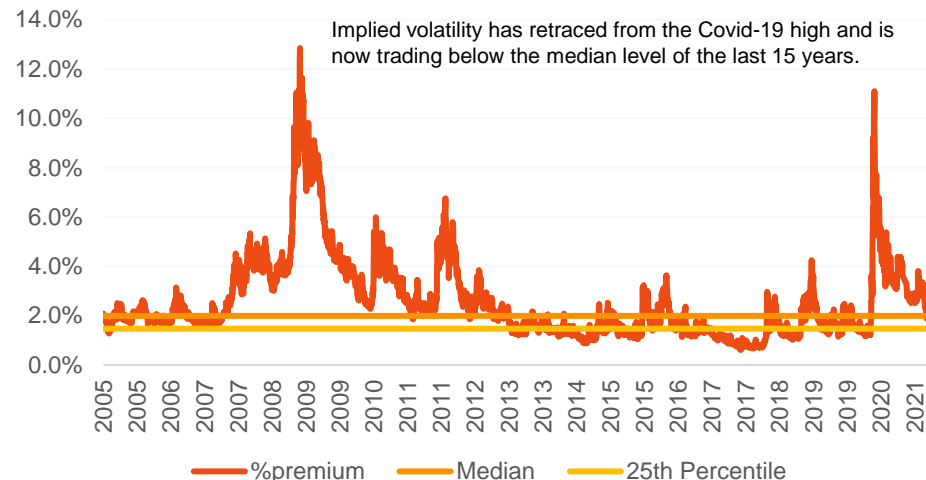
Option skew continues to see calls more attractive relative to puts

Implied volatility pricing: ASX & SPX (3- and 6-month tenors)



Source: Bloomberg, Frontier

Historical implied volatility: SPX 6-month 105 call



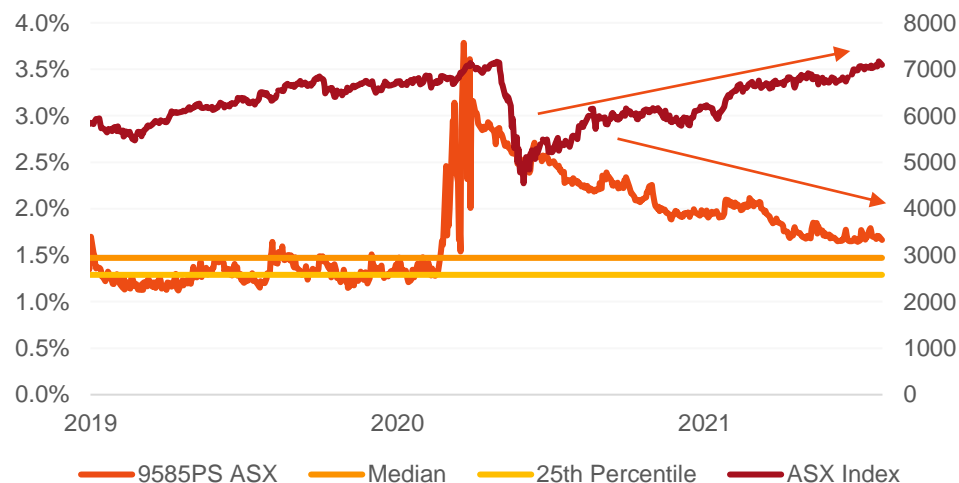
Source: Bloomberg, Frontier

Option strategy	Option performance	Considerations
<p>As equity markets trade at new records highs, option skew continues to see equity call options trade at cheaper levels compared to puts.</p> <p>Buying call options can give investors upside protection for a potential equity market rally, if the underlying portfolio already is positioned for a weak equity market.</p>	<p>A 105 call option performs if the equity market rallies more than 5% within the next six months.</p> <p>Investor could choose to replace underlying equity exposure with a call option, to replicate the equity beta exposure with downside limited to the option premium cost.</p>	<p>This strategy would suit an investor that is concerned about a market rally in the near term.</p> <p>Investors that are underweight equities could use call options to gain upside exposure and still participate in equity market rallies > 5%.</p>

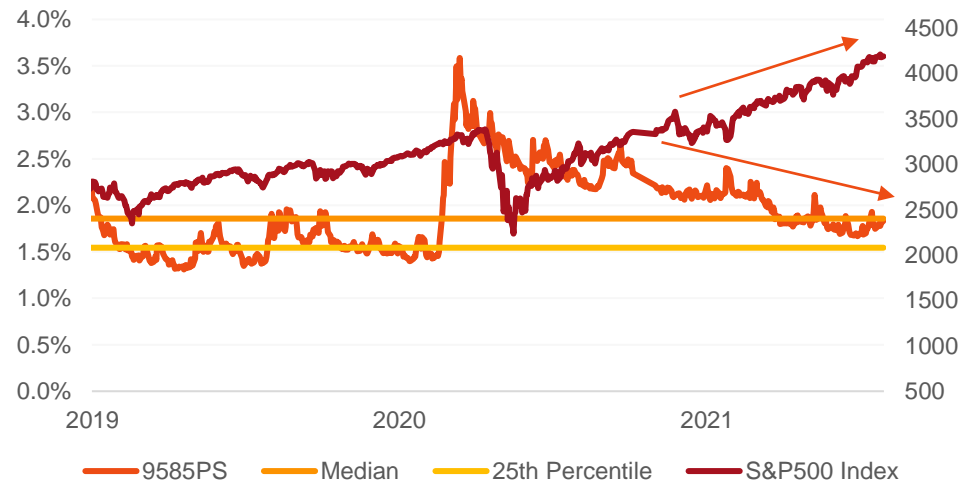
B. Buying index put spreads

Equity markets at record highs with put option costs at 12-month lows

ASX 200 and 6-month 95/85 put spreads



S&P500 and 6mth 95/85 put spreads



Source: Bloomberg, Frontier

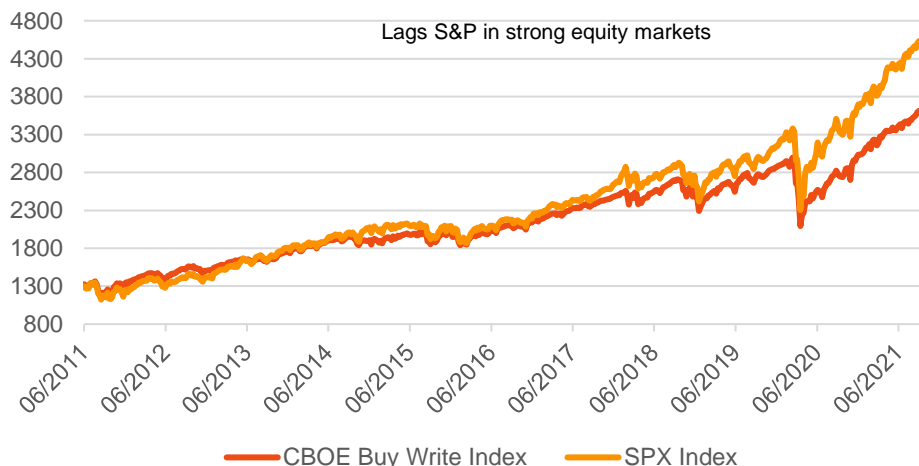
Source: Bloomberg, Frontier

Option strategy	Option performance	Considerations
<p>Current volatility pricing has seen equity put options trade at 12 month lows. Albeit still higher than pre Covid-19 levels.</p> <p>This is despite equity markets reaching new record highs, providing investors with the opportunity to purchase downside protection at the cheapest levels since Feb 2020.</p> <p>Purchasing equity put spreads reduce the cost of downside protection, compared to outright put options.</p>	<p>A six month 95/85 equity put spreads perform when the equity market falls between 5-15% within the next six months.</p> <p>Frontier prefers laddered monetisation profile when using equity options for downside protection. That is, setting predefined levels to close out the option position if markets fall.</p> <p>When monetising the option, investors can choose to roll the downside protection into a new option by re-striking and keeping downside protection in place, or choose not to roll which locks in the profit but removes the downside protection.</p> <p>The appropriate monetisation strategy should be discussed with your options manager or Frontier.</p>	<p>This strategy would suit an investor that is looking for protection against shallow equity market drawdowns (e.g., 5-15%).</p> <p>This strategy does not provide further protection against large equity market drawdowns (e.g., drawdowns in excess of -15%).</p>

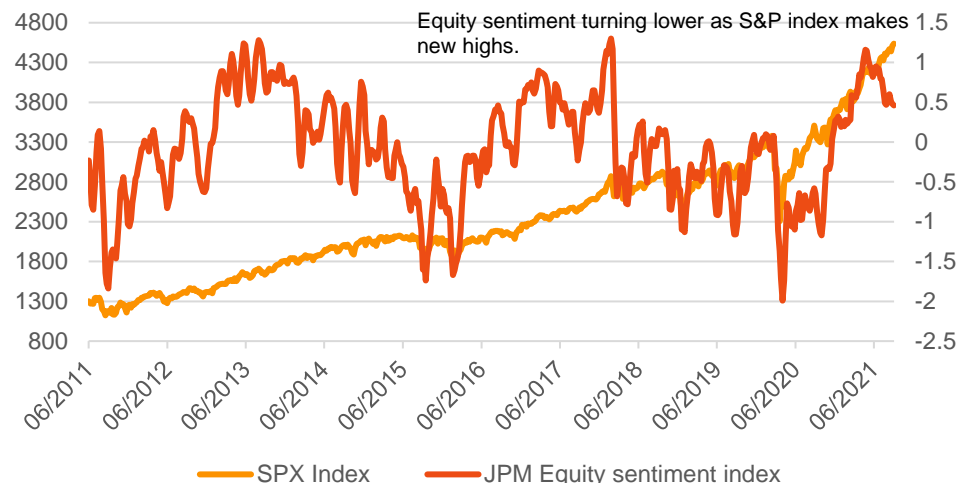
C. Call overwriting

Reduce equity exposure as the market rallies and receive option premium income

CBOE S&P 500 index 30-Delta buy write index



Equity sentiment and S&P 500



Source: Bloomberg, Frontier

Source: Bloomberg, Frontier

Option strategy	Option performance	Considerations
<p>The call writing strategy involves selling OTM call options linked to an equity index. The option seller earns the option premium as income but is exposed to losses in the event of a significant upside market move.</p> <p>The investor holds their underlying equity position constant, allowing them to remain invested in the market.</p> <p>The strategy could be either a one-off tactical approach or part of an ongoing program. This will ultimately depend on the investor's risk/return objective.</p>	<p>Selling 115 call options will perform unless the market rallies more than 15% from the current level.</p> <p>If the market does not rally more than 15%, the option seller will earn the option premium as income and there is no option payout required.</p> <p>If the equity market rallies more than 15%, then the option seller will need to sell the underlying equity index to the option buyer. This would therefore reduce the underlying equity exposure of the investor as the market rallies.</p> <p>This strategy would suit an investor seeking additional yield or has a view that the equity market will not rally beyond the option strike level (ie. >15%). It can also be used by investors that are already overweight equities as the strategy reduces exposure when the market has rallied more than 15%.</p>	<p>Implementation for a one-off tactical trade could be via a swap overlay manager, who would sell the calls on the investor's behalf.</p> <p>For an ongoing call selling program, implementation could be via a total return swap, an external manager, or directly by the asset owner.</p>

Indirect equity hedges

Costs are a key consideration for any downside protection strategy. Indirect hedging – using derivatives on one asset to hedge another (e.g., equities) – is one way of managing costs. While indirect hedges can provide more effective hedging, they also introduce a degree of basis risk.

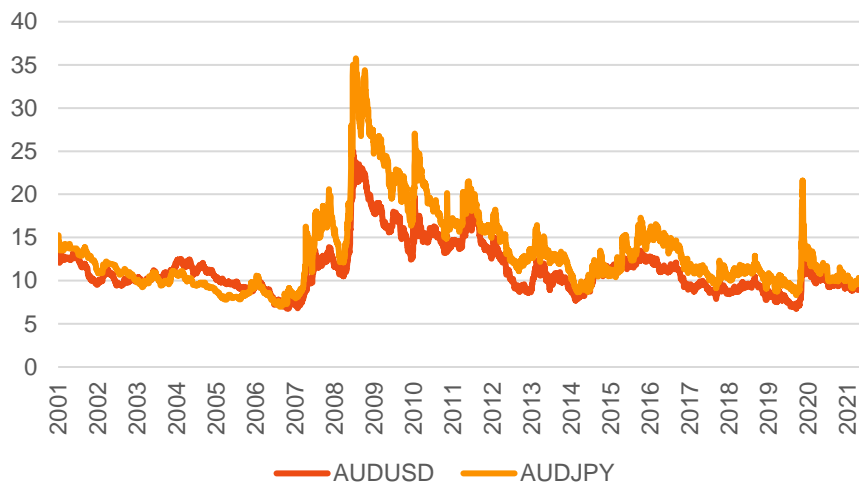
Key considerations when determining a suitable hedge include, but are not limited to, the relationship between assets, cost, and basis risk. We consider several indirect hedges for providing portfolio protection from a falling equity market environment.

Strategy	Scenario	Objective	Rationale	Trade example	Risk
A. AUDJPY currency options	Portfolio is long equities.	Strategy protects against an equity market sell off.	Options on the Australian dollar Japanese Yen cross are priced at a discount to equity options. Historically, holding AUDJPY put options has profited when equity markets fall.	Purchase an AUDJPY put option.	Equities fall without a similar move in AUDJPY.
B. Interest rate swaptions	Portfolio is long equities and is sensitive to increasing interest rates.	Strategy protects against an increase in rates.	A payer swaption is a more direct hedge for a higher interest rate environment, which could cause equity markets to fall.	Purchase a payer swaption.	Falling equities are caused by something other than higher rates.
C. VIX options	Portfolio is long equities.	Strategy protects against an equity market sell off.	Strategy profits when volatility increases.	Purchase a VIX option.	Equities fall but volatility is unchanged. E.g., a long slow equity market decline.

Currency options

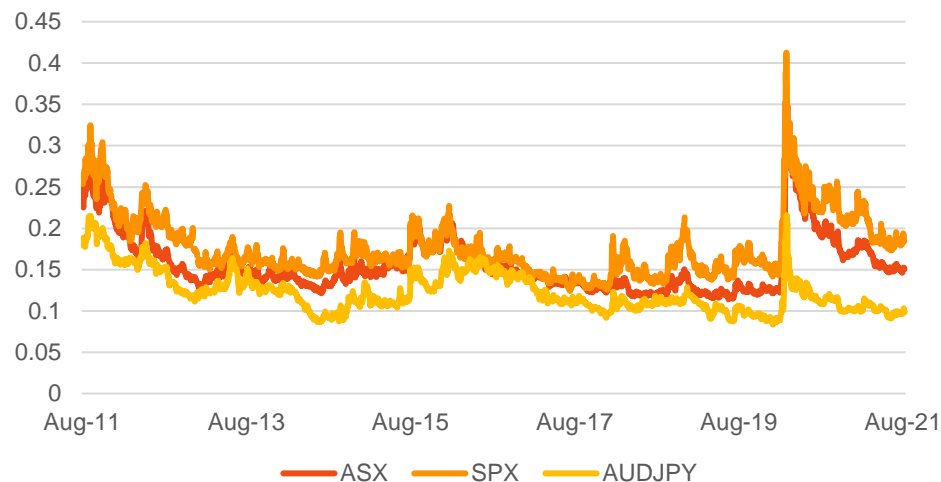
AUDJPY implied volatility remains lower than equity volatility

AUDUSD and AUDJPY implied volatility



Source: Frontier

AUDJPY vs ASX, SPX implied volatility



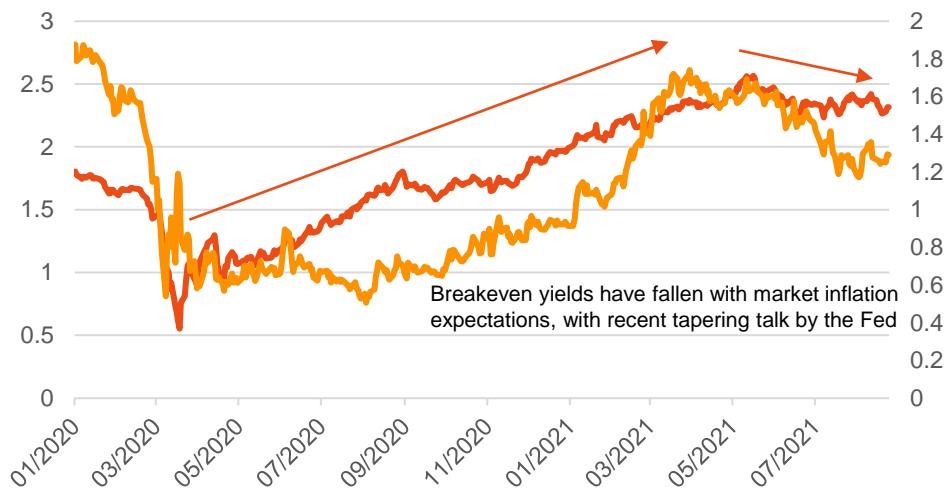
Source: Frontier

Indirect hedge strategy	Alternative strategy	Option payoffs	Considerations
<p>Buying 1yr ATM AUDJPY put option</p> <p>Client wanting downside protection for potential equity market sell off, if underlying portfolio already positioned for a strong equity market.</p>	<p>Decrease in underlying equity portfolio or purchase an ASX 1yr put option.</p>	<p>Strategy begins to perform when AUDJPY sells off from current levels.</p> <p>Strategy underperforms if currency rallies, however, loss is limited to the premium cost.</p>	<p>This strategy would suit an investor that is concerned about a near term market sell off.</p> <p>There is basis risk between the magnitude of the fall between AUDJPY and ASX, ie. the ASX may experience a large drawdown and the AUDJPY is unchanged.</p>

Swaptions

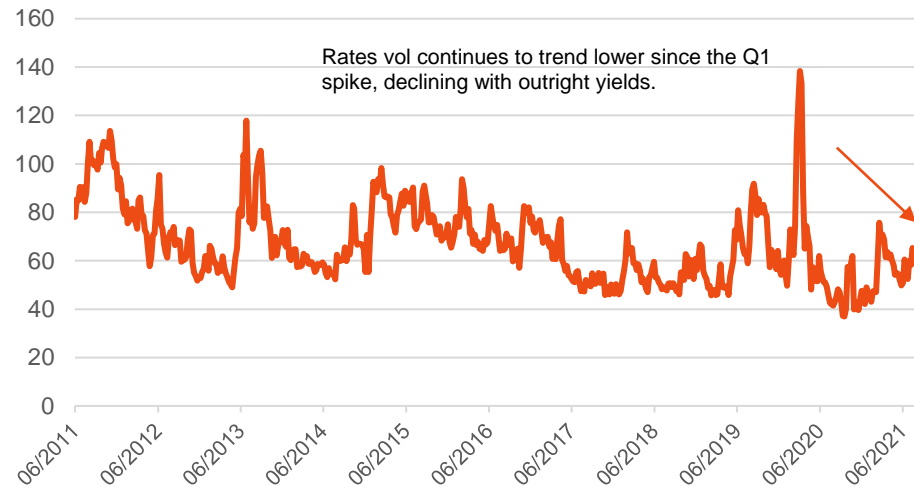
Swaptions skew and breakeven rates have declined with outright yields

US 10-year breakeven rates & 10yr Treasury yield



Source: Frontier

MOVE index



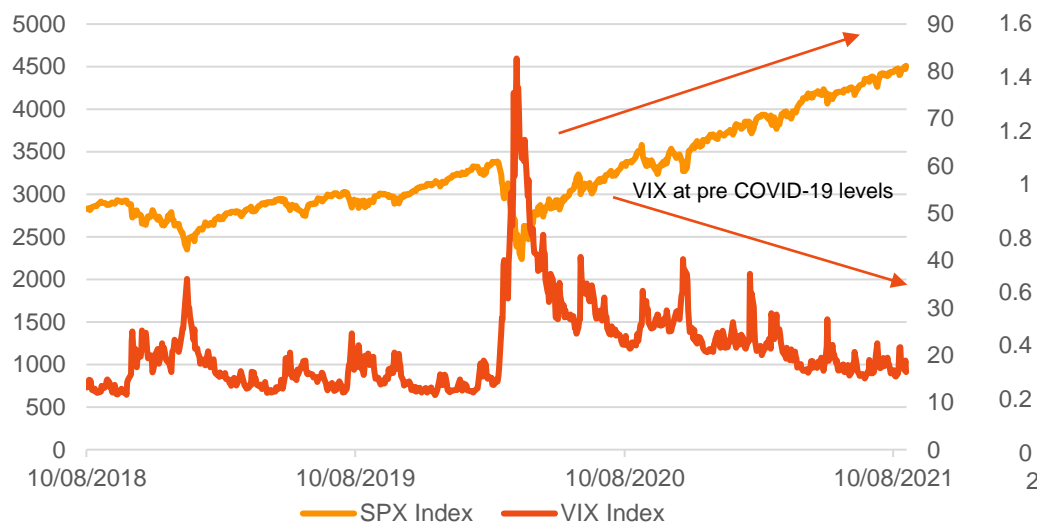
Source: Bloomberg, Frontier

Indirect hedge strategy	Option performance	Considerations
<p>Buying 1y10y ATM payer swaption.</p> <p>Client wanting downside protection for potential equity market sell off from a rise in interest rate yields, if underlying portfolio already positioned for a strong equity market.</p> <p>This strategy would also provide protection from raising yields resulting from higher inflation expectations.</p>	<p>A payer swaption performs when interest rate yields rise.</p> <p>There is a strong correlation between inflation expectations and higher yields. Due to expectations of central bank tapering and stimulus withdrawal on the horizon, inflation expectations have started to reside which has seen outright yields come off the highs seen in Q1 2021.</p> <p>This is also seen swaption skew (cost of bond puts (payers) minus bond calls (receivers)) shift in pricing where payer swaptions are less expensive compared to earlier this year. This allows investors who are concerned about higher yields to add protection at a cheaper cost than Q2 this year.</p>	<p>This strategy would suit an investor that is concerned about a near term rise in interest rate yields.</p> <p>Where an investor holds bonds, Frontier would consider to retain the underlying bond holdings within a portfolio (due to the income and carry earned over the life of the bond) and use swaptions to hedge against higher interest rates when pricing is appealing.</p> <p>This additional income can potentially insulate the portfolio from a small sell off in interest rates (i.e. prices lower, yields higher).</p>

Buying the VIX index for equity volatility protection

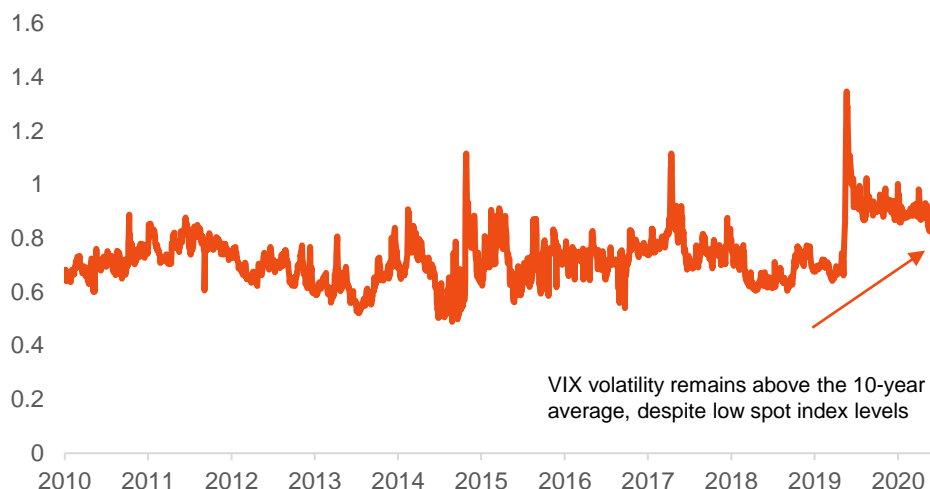
The VIX index is back at pre COVID-19 levels

VIX index and S&P 500



Source: Frontier

3 month ATM VIX call option volatility



Source: Frontier

Indirect hedge	Return profile in equity drawdown	Considerations
VIX futures	VIX usually rises when S&P 500 index falls with material rises observed in deep market stresses.	VIX can also retrace very quickly, and so active monetisation decisions should be considered. Futures can be an effective and efficient monetisation tool, as futures are generally more liquid than options.
Call options on the VIX	This strategy profits when the VIX rises but only loses the premium if the VIX falls.	The options market is becoming more liquid. As with any option, consideration needs to be given to the strike and maturity of the options. Roll risk can be managed by using a staggered maturity approach. Given volatility pricing remains elevated post COVID-19, one way to cheapen the outright VIX calls is to sell VIX puts to finance the purchase of these calls. Not only does this add to a long VIX delta profile, it also reduces the cost of the trade at inception.

Carbon market strategies

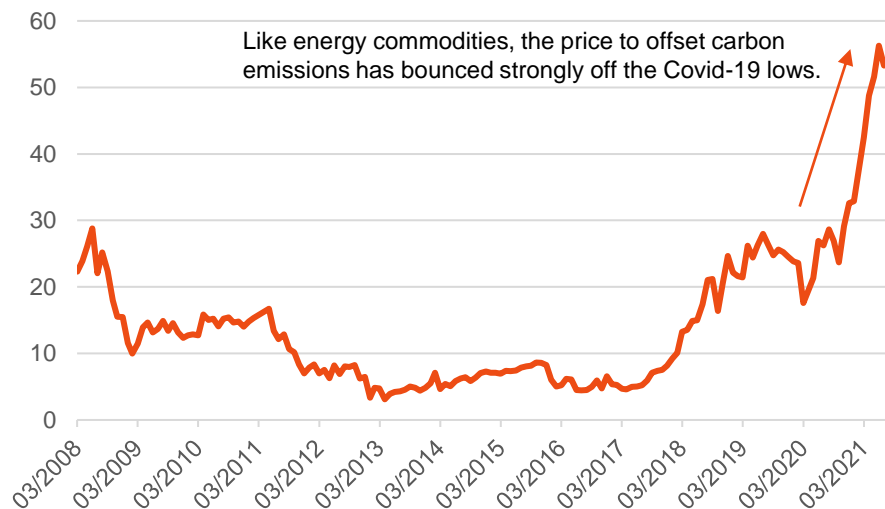
Many investors are looking to reduce the carbon intensity of their portfolios, whether it is to achieve a better risk adjusted return or to have a more sustainable investment strategy. We highlight three strategies which may provide protection against higher carbon prices, reduce the carbon footprint of a portfolio, or offer return opportunities. For a more detailed discussion of the carbon offset emission derivatives market see our paper, which can be found at www.frontieradvisors.com.au.

Strategy	Scenario	Rationale	Trade example
A. Carbon offset emission future	Overlay strategy to reduce carbon intensity of a portfolio and reduce risk from higher carbon prices on the portfolio.	Provides a carbon offset to a portfolio. Benefits from a rise in price to emit carbon. Most liquid derivative product and exchange traded	Buy Carbon offset emission future (EUA) Derivative structured product based on the EU EUAs.
B. Relative value carry strategy	Curve trade opportunity. The current EUA futures curve is in 'contango' – the longer-dated maturities have a higher price than the current spot price. This provides an opportunity to trade the curve by selling the longer-dated futures and buying the shorter-dated futures.	Earns the implied carry in the futures curve. This strategy does not provide any carbon offset to a portfolio, as the position is neutral	Buy the current spot contract, and sell the 8 th contract.
C. Overlay swaps	Overlay strategy to reduce exposure to single stocks or sectors within a portfolio that have a high carbon footprint.	Aim to increase or decrease the exposure to certain companies in accordance with investor's ESG criteria. i.e., Reduce high carbon emitters and replace with low carbon emitters	Bespoke overlay solution with specific ESG constraints – completion swaps.

Carbon offset emission future

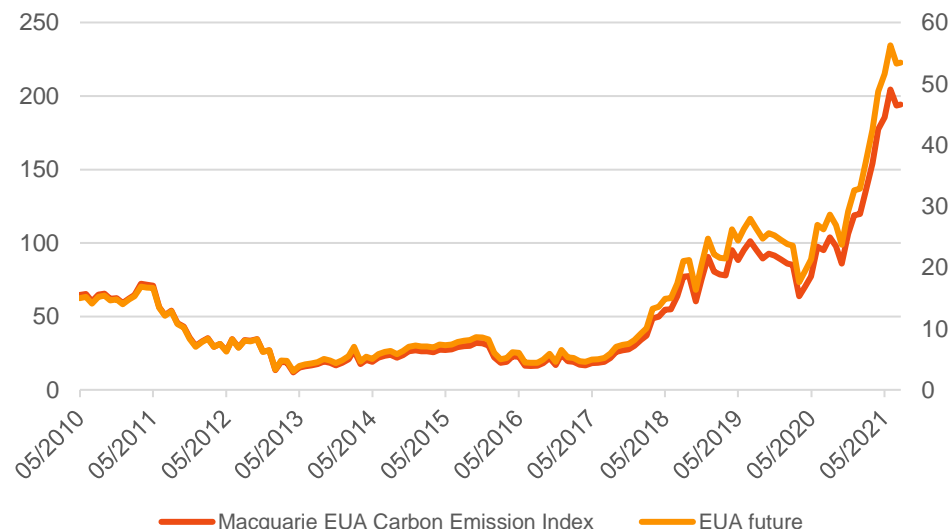
Hedge against the risk of higher carbon prices

Carbon offset emission future



Source: Frontier

EUA and bespoke index structured note

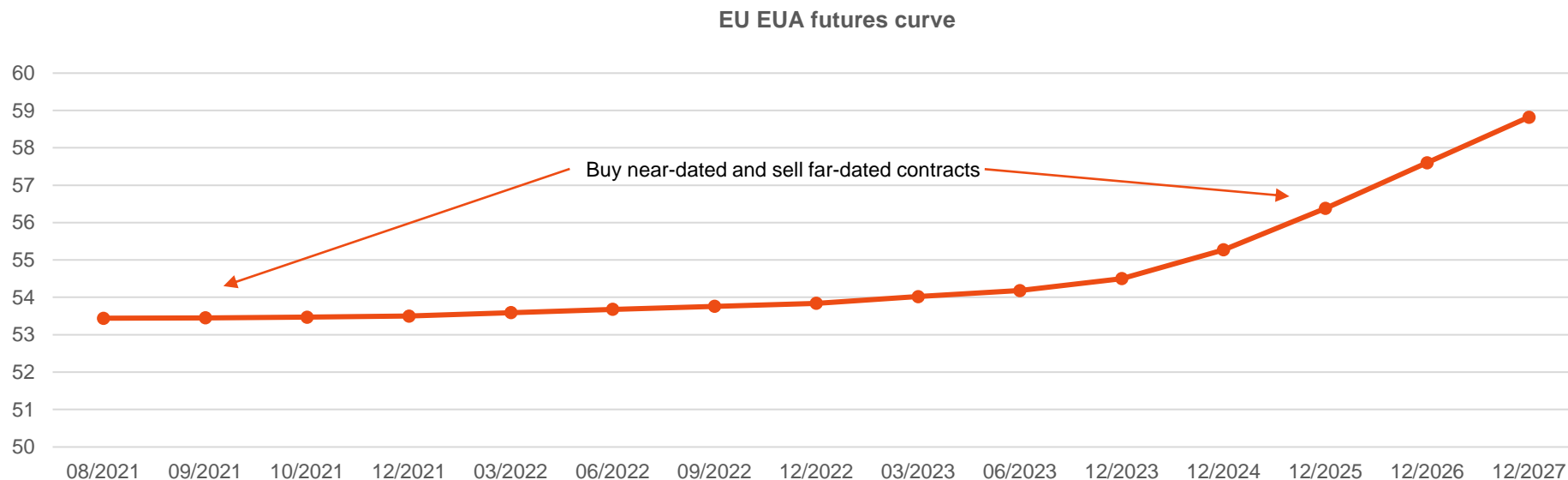


Source: Macquaire, Frontier

Overlay hedge strategy	Correlation	Implementation	Considerations
<p>Buying the carbon offset emission future gives investors the ability to offset the carbon footprint within a portfolio by including an allocation to emission certificates via the carbon offset emission future.</p> <p>Investors can also express specific views on the price of carbon, i.e., benefiting from the rise in the price carbon emissions.</p>	<p>The price of carbon offset emission future has a high correlation to energy commodities.</p> <p>The recent surge in price since the middle of 2020 has come from a combination of stronger global regulatory alignment to reduce carbon emissions and higher energy commodities prices.</p>	<p>Investors could purchase the carbon offset emission futures directly from the exchange (ICE), via their derivative manager or futures broker.</p> <p>Alternatively, investors could buy a swap on a bespoke index based on the performance of the carbon offset emission future (EU EUAs). The index rolls from the current ICE EUA December future contract to the next year's December contract. This approach uses one product instead of multiple futures contracts, therefore requiring less management.</p>	<p>EU EUAs will only provide protection from changes in the price to emit carbon within the EU, and therefore may create basis risk as there is no global carbon price.</p> <p>Subject to other market movements, speculative positioning may add to volatility not related to climate change.</p>

Relative value carry strategy

Contango futures curve allows for carry opportunities

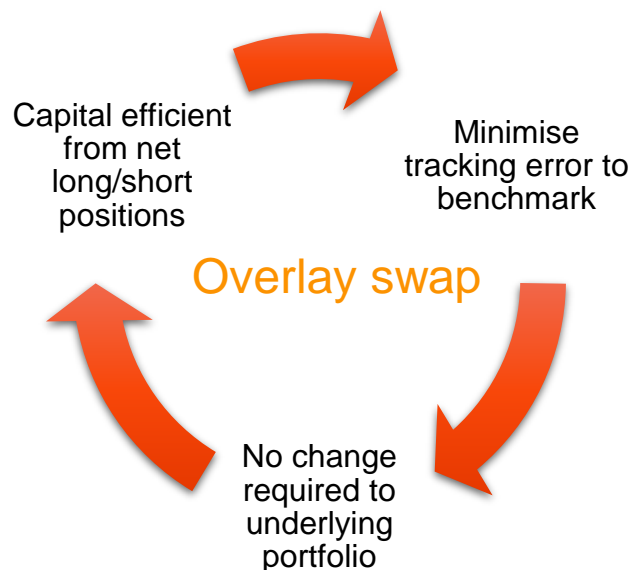


Source: Frontier

Overlay hedge strategy	Carry and Roll	Implementation	Considerations
<p>The current EUA futures curve is in 'contango' – the longer-dated maturities have a higher price than the current spot price. This can be exploited using a curve strategy where you sell the far-dated future and buy the near-dated future.</p> <p>This strategy does not provide any carbon offset to a portfolio, as the position is market neutral</p>	<p>This strategy takes a neutral position in the futures market and relies on longer dated contract 'rolling' down the curve to the lower price of the current spot contract.</p> <p>This allows the investor to earn the 'implied carry' in the shape of the futures curve.</p>	<p>Investors could purchase the carbon offset emission futures directly from the exchange (ICE), via their derivative manager or futures broker.</p>	<p>The shape of the curve may steepen. The change in price of the long position may not offset the change in price of the short position resulting in a loss or mark-to-market volatility.</p>

Overlay completion swap

Total portfolio hedge to reduce carbon emission from underlying portfolio positions



Overlay hedge strategy	Benefits	Constraints to consider
<p>Overlaying an existing equity portfolio, completion swaps aim to increase or decrease the exposure to certain shares in accordance with investor's ESG criteria.</p> <p>Investor can enter a swap based on a long/short basket of equities which reduces the carbon intensity of the portfolio by reducing exposure to high carbon emitters and increasing exposure to low carbon emitters.</p>	<p>Identifies an explicit cost to reducing carbon intensity of a portfolio.</p> <p>No need to change underlying equity manager allocations.</p> <p>Maintain ownership in underlying companies, and therefore can continue active engagement.</p> <p>Capital efficient using a net long/short swap.</p>	<p>Tracking error to underlying benchmark – a key YFYS consideration.</p> <p>Impact on ex ante volatility of the portfolio.</p> <p>Sector or geographic exposure.</p>

Alternatives and derivatives research team

Frontier has been advising clients on the use of options since 2014. We have advised defined contribution, defined benefit and insurance clients and have worked with various option implementation managers.

Frontier advises clients on a range of derivative issues including:

- overlay manager selection,
- strategy selection,
- structuring, and
- monetisation.

If you or your fund are interested in derivatives, particularly to manage risk, Frontier can assist. Please reach out to a consultant or to a member of the Alternatives and Derivatives Team.

Alternatives and Derivatives Research Team members:

[Scott Pappas](#) – Principal Consultant

[James Bulfin](#) – Senior Consultant

[Iain McMahon](#) – Senior Consultant

[Claire Casucci](#) – Senior Consultant

[Donna Davis](#) – Consultant





Level 17, 130 Lonsdale Street

Melbourne, Victoria 3000

Tel: +61 3 8648 4300

frontieradvisors.com.au

@frontier_adv

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