Risk Premia Highlights

Systematic rates volatility in 2022 and rates carry prospects

Global Quantitative and Derivatives Strategy

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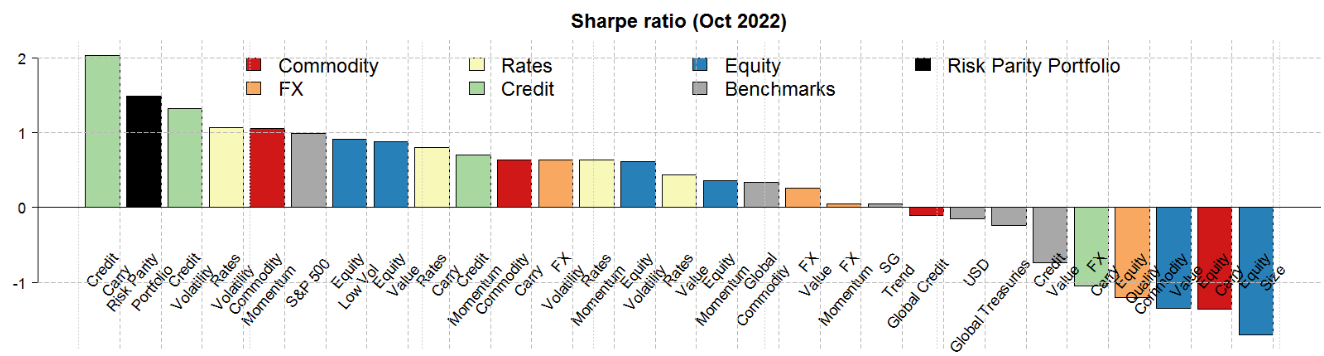
- **Improved risk sentiment in October helped the laggards in the risk premia space**
  Expectations of a 'Fed Pivot' supported some Risk Premia strategies that faced challenges so far in 2022: Credit Carry, Rates Volatility and Rates Carry. We discuss the latter two in more detail below.
- **Systematic rates volatility in 2022**
  After the eras of QE, stubbornly low inflation, forward guidance, and negative rates, 2022 put an end to a decade-long downward trend in interest rates volatility. In the latest Quantitative Perspectives publication, we analyze the optimal design and review the year-to-date performance of long vol strategies from the point of view of the systematic investor.
- **Rates carry strategies prospects**
  The rising yield levels have renewed the interest in Rates Carry, which has had poor performance since the outbreak of the pandemic. We will demonstrate that yield levels are not actually very important for the potential of Rates Carry. Divergence, stability, and the ability to hedge undesired factor exposures, on the other hand, matter greatly.

October respite for aggressive risk premia strategies

Expectations of a 'Fed Pivot' supported some Risk Premia strategies that have been challenged so far in 2022: Credit Carry, Short Rates Volatility and Rates Carry. Credit Volatility, Commodity Momentum, Equity Low Vol and Equity Value also enjoyed strong performance. Equity Size, Equity Carry, Commodity Value and Equity Quality were the poorest performers this month.

Figure 1: Recent Sharpe ratios of risk premia



Source: J.P. Morgan Quantitative and Derivatives Strategy

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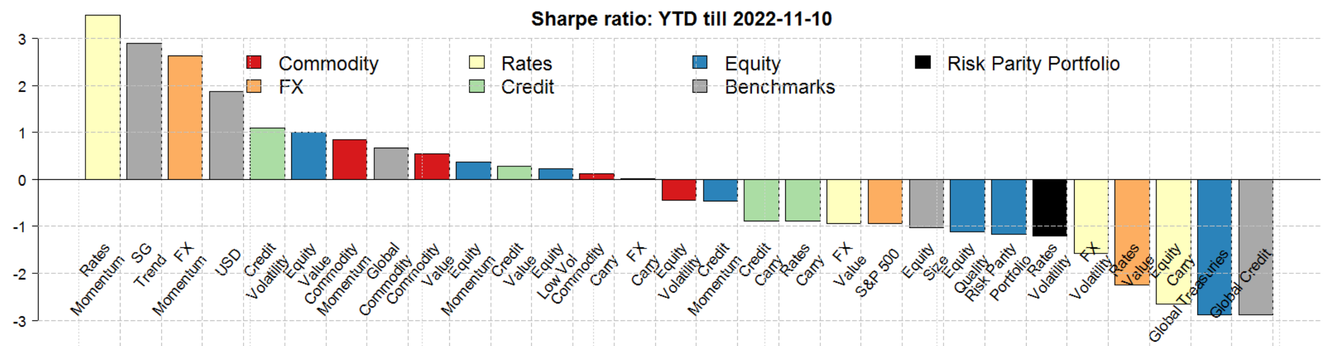
Focusing on YTD performance in Figure 2, the strong October performance has improved Sharpe of the Risk Parity portfolio, though from depressed levels. Momentum (Trend) strategies continue to be this year's stars.

Figure 2: YTD Sharpe ratios of risk premia versus market benchmarks



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Systematic rates volatility in 2022

Rates volatility is alive and well

After the eras of QE, stubbornly low inflation, forward guidance, and negative rates, 2022 has put an end to a decade-long downward trend in interest rates volatility. The catalyst for that regime change was persistent inflation and central banks, at first inclined to believe that that phenomenon might be short lived, eventually had to pull all the stops to rein it in (for additional discussion please see What if the mean reverts?).

Figure 3: Rates volatility is alive and well

Source: J.P. Morgan Quantitative and Derivatives Strategy

Figure 4: Long 1y10y swaption straddle, delta hedged daily, and held for 6 months.

Source: J.P. Morgan Quantitative and Derivatives Strategy

Owning rates vol

The simplest way to go long volatility is to buy an at-the-money straddle and to delta hedge it, typically daily. Figure 4 shows an example of this, with the performance of a 1y expiry swaption straddle on a 10y USD swap. Each swaption is delta hedged daily, held for 6 months, and then rolled into a new 1y option. Performance has been good this year, mirroring the trend higher in implied vol observed on Figure 3.

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Long vol strategies need to compose with two headwinds

A generic long vol strategy, however, is typically exposed to two headwinds. The first one is that it incurs a cost through the so-called volatility premium, i.e. the difference between implied volatility and (ex-post) realized volatility. Figure 5 below shows that premium for the 3m expiry, 10y USD tenor over the past two years. The premium was positive in 2021 through this year, however this premium has flipped to negative for certain expiries and tenors, translating into a tailwind for swaption buyers.

Figure 5: Through most of 2022, the volatility premium has been negative

Source: J.P. Morgan Quantitative and Derivatives Strategy

Figure 6: Compare and contrast: owning ATM delta hedged SPX straddles in 2022.

Source: J.P. Morgan Quantitative and Derivatives Strategy

The second headwind, when buying volatility through vanilla options, is that the term structure of implied volatility is typically increasing, a feature that we find across many markets. This entails, in particular, that, in the absence of market moves, long option positions incur a negative mark to market. These two headwinds, taken together, explain why a delta-hedged, 3m ATM SPX straddle would not have shone this year, despite both realized and implied vol rising.

Long-dated swaptions solve this conundrum

The swaption market, however, has the specificity that, for longer-dated expiries and tenors, the term structure of implied volatilities is downward sloping, as Figure 7 illustrates. We also find a similar pattern in the volatility premium, which tends to be lower (and even negative) for long-dated structures, as summarized in Table 1.

This feature of long-dated swaption volatility is typically attributed to the issuance of callable bonds and, in particular, of Formosas. Formosa bonds are foreign currency bonds issued in Taiwan, which have been historically popular with Taiwanese insurers. Our Derivatives Rates Strategy colleagues keep track of their issuance: see for example Interest Rate Derivatives: Frozen, p13.

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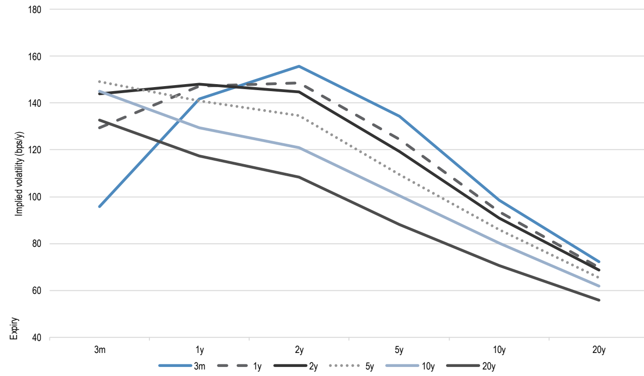
Figure 7: The term structure of implied volatility is typically downward sloping for long expiries and tenors



Source: J.P. Morgan Quantitative and Derivatives Strategy

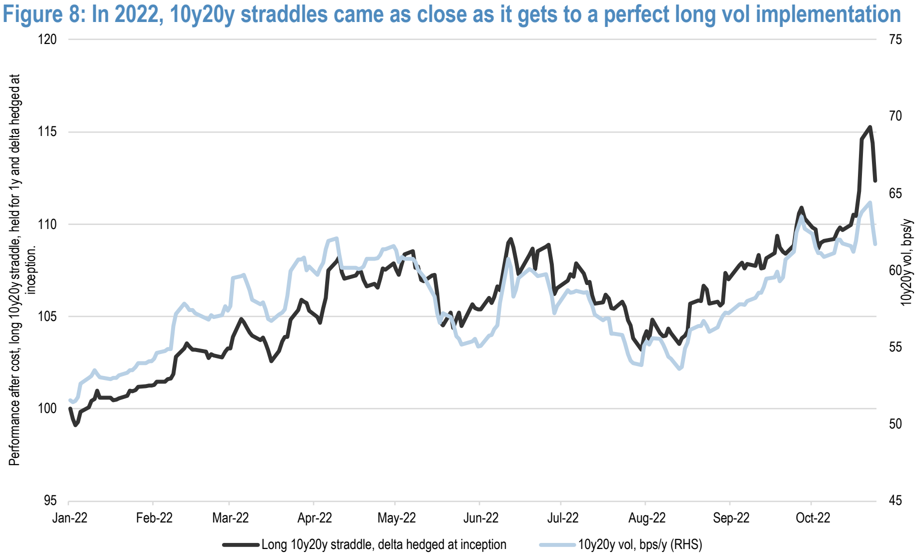
Table 1: Average volatility premium since 2005: significantly lower for long expiries and tenors

Expiry	Tenor 2y	5y	10y	20y
3m	6	3	2	2
1y	15	4	2	-1
5y	42	16	7	-2
10y	33	7	-3	-12

Source: J.P. Morgan Quantitative and Derivatives Strategy

Owning an option whose volatility term structure is downward slopping means accruing positive mark to market through Vega exposure as time passes, all else equal. And a low volatility premium means a cheaper cost of carry through the position's gamma. Taken together, these features are a remedy to the two headwinds mentioned earlier. The 2022 performance of 10y straddles on 20y swaps illustrates this well. That strategy consists of 10y expiry straddles on 20y USD swaps, delta hedged at inception, and rolled after one year. It performed positively in 2022, mostly tracking the volatility of the underlying, even with costs factored in.

Figure 8: In 2022, 10y20y straddles came as close as it gets to a perfect long vol implementation



Source: J.P. Morgan Quantitative and Derivatives Strategy, Bloomberg.

Will Rates Carry shine again?

Rates Carry was one of the darlings of the risk premia community with consistent performance from 2000 till the onset of the Covid pandemic. Fortunes changed when the CBs aggressively cut rates and embarked on massive expansions of their balance sheets to soften the hardships from the lock-down measures. Nowadays, the tightening stance of the monetary authorities around the world, in order to contain the spiraling inflation figures, has led to higher yields. We often hear the narrative higher yields entail potential comeback of the rates carry strategy. In the latest Quantitative Perspectives

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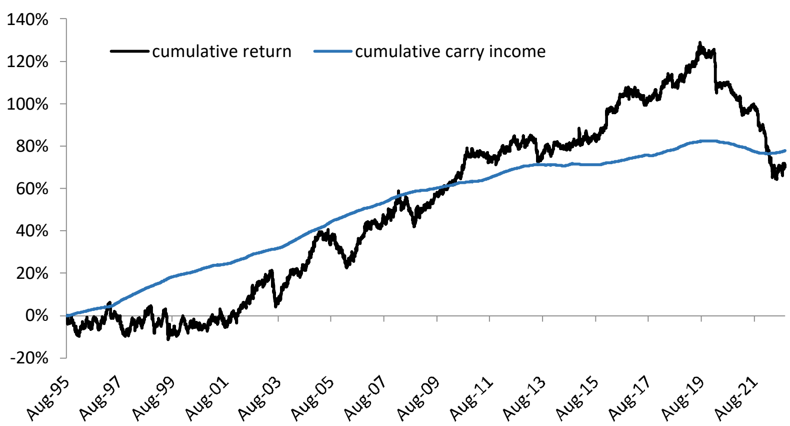
publication, we delve into the details of the rates carry profit drivers and discuss why the above statement is, at best, a simplification of the more complex picture behind.

Rates Carry: standard and market-neutral approaches

First things first, let's review the two distinct approaches to rates carry: Ranking and Market-Neutral Carry. Both approaches are discussed in detail in Market-neutral carry strategies – Harvesting carry without market risk.

The Ranking takes long exposures to the highest carry securities and short the lowest carry securities. While straightforward in nature, the downside of the Simple Ranking approach is their inherent exposure to market risk and short volatility risk. Market-Neutral Carry, on the other hand, aims to solely harvest the carry premium by hedging factor exposures.

Figure 9: Cumulative return and carry income Simple Ranking



Source: J.P. Morgan Quantitative and Derivatives Strategy

Table 2: Return characteristics Simple Ranking

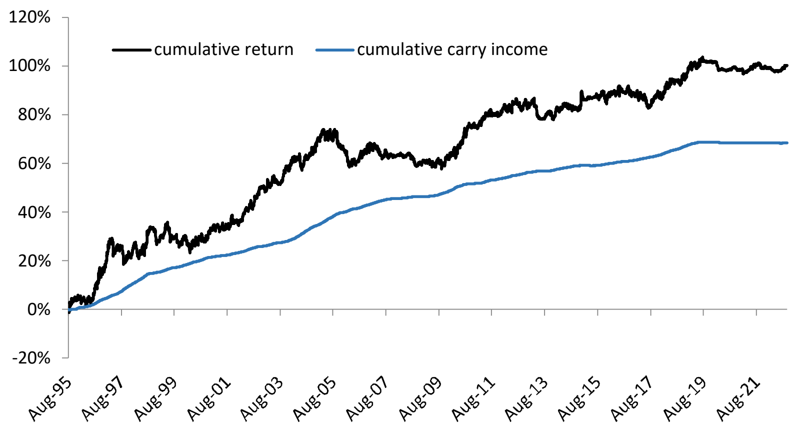
	H1	H2	Full
sdate	Sep-95	Apr-09	Sep-95
edate	Mar-09	Oct-22	Oct-22
ann avg	3.86%	1.43%	2.62%
ann std	10.41%	10.82%	10.62%
sharpe	0.37	0.13	0.25
maxdd	0.17	0.49	0.49
skew	-0.29	-0.17	-0.23
kurt	2.48	2.67	2.59

Source: J.P. Morgan Quantitative and Derivatives Strategy

The Simple Ranking method generates positive returns over the full sample but the pay-off pattern, however, is not particularly encouraging. The Sharpe ratio is low, drawdown at the end of the sample is severe and the strategy produces has a highly negative skew. The total return exhibits limited similarity to the harvested carry income – the driver that we ultimately aim to capture.

The Market-Neutral Carry strategy on the other hand, exhibits both much stronger risk-adjusted returns as well as doing a much better job in harvesting the carry. The crucial element of the Market-Neutral Carry approach is that it is capable to distinguish between carry as alpha source and carry as a compensation for market exposure and other factor risks. In the track record, here, that capability shows in much better performance, especially towards the end of the sample.

Figure 10: Cumulative return and carry income Market-Neutral



Source: J.P. Morgan Quantitative and Derivatives Strategy

Table 3: Return characteristics Market-Neutral

	H1	H2	Full
sdate	Sep-95	Apr-09	Sep-95
edate	Mar-09	Oct-22	Oct-22
ann avg	4.49%	2.92%	3.69%
ann std	7.38%	6.44%	6.93%
sharpe	0.61	0.45	0.53
maxdd	0.15	0.09	0.16
skew	-0.14	-0.13	-0.13
kurt	2.68	6.22	4.10

Source: J.P. Morgan Quantitative and Derivatives Strategy

Drivers of Rates Carry

1. High yield doesn't entail high carry – it is the shape of the yield curve that matters

A commonly heard argument is that yields have increased sharply and therefore the time is ripe for carry once again. As we have mentioned, such a statement is an oversimplification of drivers of interest rate carry in the case of Bond Futures or Swaps. Carry consists of two components: yield pick-up (or excess interest) and roll down the curve. Yield pick-up is easy to assess – it will be high when the difference between the 10yr yield, and the 3-month risk-free rate is high, **which does *not* necessarily coincide with the cases when the 10yr yield is high**. The other element of carry is roll-down-the-curve. Again, a closer inspection of this demonstrates no direct link to the level of the 10yr rate.

2. Divergence- but no quick convergence

The second factor in the profitability of a long-short carry strategy is the divergence of carry among the instruments that guarantees there is a sufficient spread in the carry return between the instruments on the long and the short side.

3. Stability

The carry income accrues relatively slowly, and the portfolio positions need to be maintained sufficiently long to accrue the carry and overcome transaction costs associated with entering and exiting positions. Needless to say, there is interaction between divergence and stability and we can envisage that higher divergence from historical norms leads to lower stability.

4. Market exposure – know what you are compensated for

The final and perhaps most important element for Carry is the relationship between carry and the underlying asset class as well as additional risk factors. Even if the long-short portfolio has sufficient carry, the possibility is that it goes hand in hand with high market or other factor exposure.

Market Conditions

Next, we assess the four points in the previous section empirically.

Shape of the yield curve

Figure 11 shows scatter plot of the swap yields and the carry for the instruments in our investable universe. There is no positive relationship between the yield level and carry – on the contrary: **the highest carry currently can be found in countries that have (notoriously) low yields: Japan, Switzerland and Eurozone. Much higher yielding countries like Canada, US and UK have negative carry**.

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Figure 11: Swap yields vs carry as of 2022-10-28

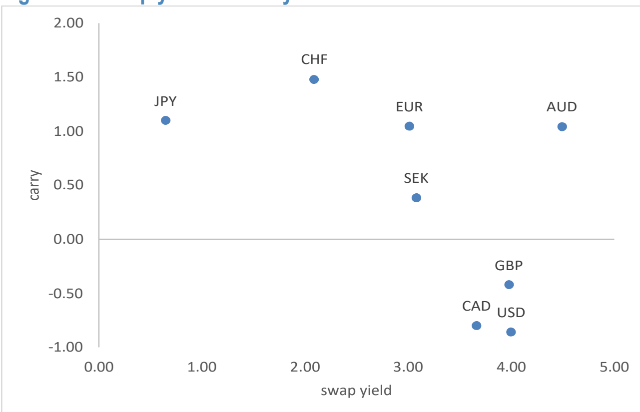

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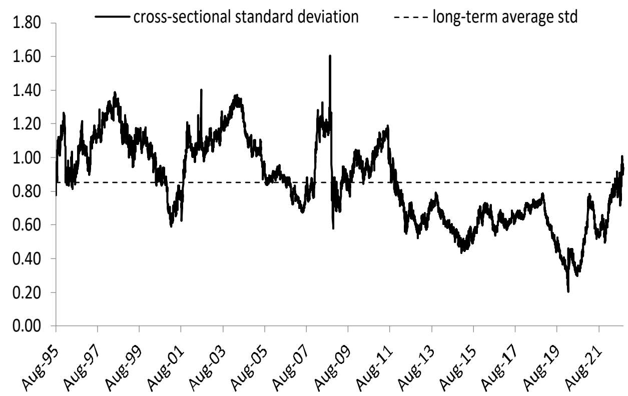
Figure 12: Cross-sectional standard deviation of carry



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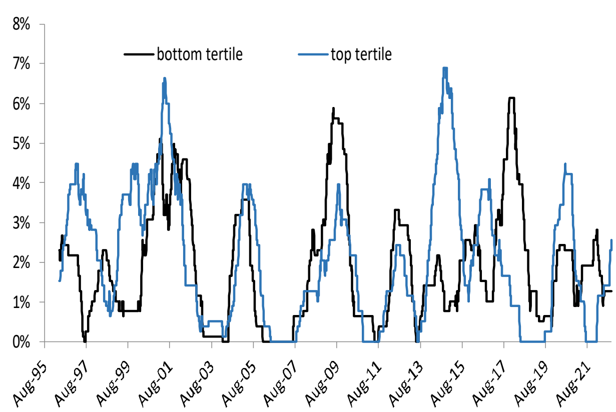
Divergence

As a measure of carry divergence, we use the cross-sectional standard deviation of carry. There are two main observations from Figure 12. Firstly, changes in monetary policy this year have led to a marked uptick in carry divergence. It is well off the lows registered during the pandemic[1]. Carry divergence is higher now than at almost any point post the Euro Sovereign crisis. While this greater divergence is promising, the second observation from the chart is more sobering: in a long-term context, it has only just has risen above its long-term average.

Stability

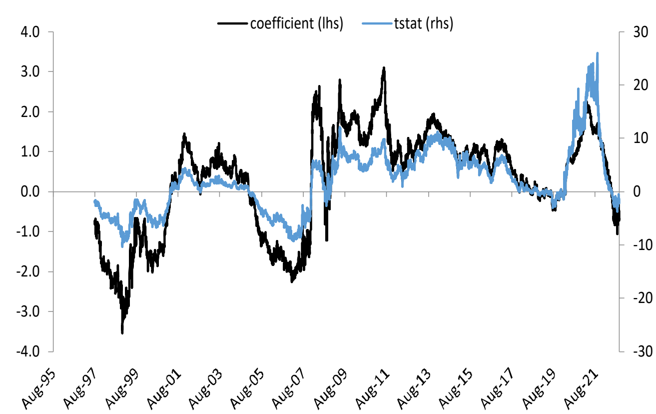
As measure of stability, we use the estimate of the probability that a security transitions out of the bottom or top tertile from month to month, averaged over 1 year. The lower this probability, the more stable carry will be. Figure 13 shows the transition probabilities on a 1-year rolling basis.

Figure 13: 1-year rolling transition probabilities



Source: J.P. Morgan Quantitative and Derivatives Strategy

Figure 14: Coefficients of the regression of carry on beta



Source: J.P. Morgan Quantitative and Derivatives Strategy

Transition probabilities for both the top and bottom tertile are currently around their long-term averages. While peaks in transition probabilities have been much higher in the past – including in the early part of our sample – we still need to consider that the divergence in carry was much larger in that early sample too.

[1] It is interesting to observe that the divergence collapsed well ahead of the outbreak of the pandemic, suggesting a high degree of uniformity in monetary policy even well before the pandemic struck

Market Exposures

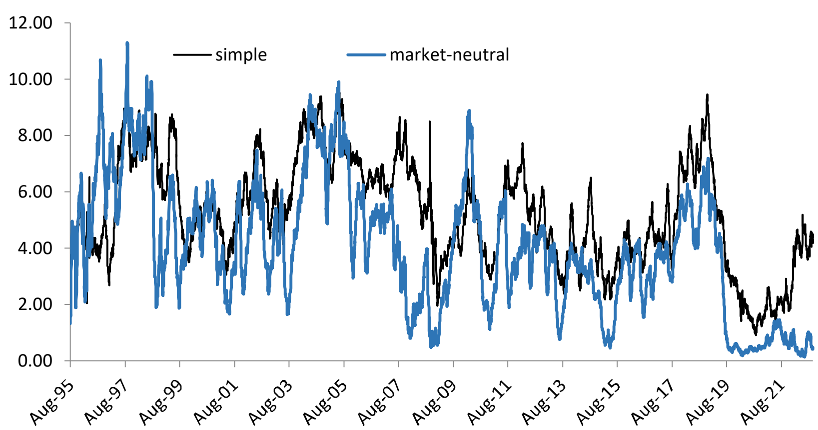
While portfolio construction will impact market and other factor exposures too, it will still be useful to get an idea the extent to which carry has implicit exposure to the underlying market. To examine this relationship, we cross-sectionally regress carry on the betas[2] to the market. Figure 14 shows that, while there is not a structural bias in the relationship, the magnitude can be large. This means in practice that, if left uncontrolled, a carry portfolio could build up significant exposure to the market at any point in time.

Is the time ripe for Rates Carry?

Summarizing all the above points, one could argue that indeed the outlook for Rates Carry is better again: carry divergence has picked-up, stability of carry is at reasonable levels and implicit market exposure has come down. That, however, is too simplistic. Since we aim to harvest carry income – which is known ex-ante – we'd require the portfolio to have sufficiently large positive exposure to carry.

The beauty of the carry strategies is that the expected return (due to the carry income) can be easily quantified. Figure 15 shows the ex-ante carry level of both the Simple Ranking as well as that of the Market Neutral portfolio.

Figure 15: Ex-ante carry exposure



Source: J.P. Morgan Quantitative and Derivatives Strategy

Interestingly, the Simple Ranking portfolio has seen a significant pick-up in carry since hitting a low in early 2021. This seems to point to a 'yes' to the question of whether the time is right for Rates Carry. The Market-Neutral portfolio, however, still has carry exposure close to zero. This divergence in carry exposure between the two approaches tells us that, now, carry effectively is closely aligned with other systematic factors or instability in the relationship among the markets – as captured by the risk model used by the Market-Neutral approach.

All in all, we believe that, while conditions are improving for Rates Carry – albeit from a low base – they aren't quite right yet. Given the 'direction of travel' that moment could come in the not-too-distant future, though.

[2] The betas are calculated by regressing the 2yr rolling weekly returns of the instruments in our universe on the average return of the instruments. We use the returns in excess of the risk-free rate and excluding the carry return.

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