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Chasing Elusive Spread Beta

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New times deliver new challenges

One of the most frequent topics of discussion we are engaged in with clients these days is how to properly define the framework of thinking about HY market's sensitivity to rising rates. The main difficulty in making objective judgment on this topic is that we do not have any historical precedents, where HY valuations, and particularly yields, were anywhere close to their current levels.

Simulating the market that never existed

We take several different approaches in addressing this topical issue, including going to the heart of the argument that we are in unprecedented environment with never before seen valuations. In doing so, we created a close replica of today's broad HY index, matching its major characteristics including yield, spread, dollar price and duration, only with bonds that existed in September 2010. The date for creating this clone was not chosen by accident of course – we wanted to see how this basket, which very closely resembles all major characteristics of today's HY market – performed in the subsequent five-month period, when 5yr rates went up by 120bps. The results suggest betas coming in well below historical averages, but not at their lowest levels either.

Hear that whooshing sound? It's the sound of beta disappearing

Separately, we devote time to track HY spread betas to rates over time historically in order to answer the question: assuming such betas go into a period of rapidly rising rates at level X, where would we expect them to be by the time the full rate jump is realized. The answer, unfortunately, confirms the elusive nature of HY spread beta, whereas it tend to deflate at the time of strongest rates moves, a.k.a. the times when investors need it most.

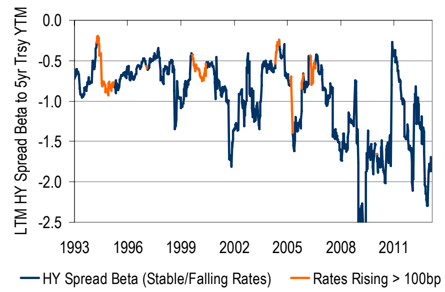
It pays to know the flow

Similarly, the history of fund flows demonstrates how HY mutual funds tend to face sharp turnarounds in investor flows once the rates start moving rapidly. Generally, such flows can withstand relatively small rate shocks, defined here as those under 100bp on a 5yr scale, although larger Treasury moves have had a perfect track record of triggering significant HY withdrawals. We also found that while equity fund flows were positive in each of the periods of rapidly rising rates, they were far from strong, and equity performance itself was quite subpar. This evidence points to loans and cash as the first stop on a journey away from bonds.

What if… rates were to rise for wrong reasons?

We also look at spread impact from rates moving in stagflationary environments.

HY spread beta to 5yr Trsy yields



Source: BofA Merrill Lynch Global Research

Refer to important disclosures on page 9 to 11. Link to Definitions on page 8.
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Chasing Elusive Spread Beta

The HY market has taken a step back in recent weeks, with the price of our US$ index notching a point lower on a 30bp widening in spread in absence of any meaningful move in 5yr Treasury yields. There are multiple factors that we could point to in trying to explain this retreat, including the reemergence of some negative European headlines or the realization that approaching US budget sequester deadline is having a potential of becoming a greater battleground now that the debt ceiling "can" has been kicked a bit further down the proverbial road. But the truth is that none of this is really new – we doubt there were too many investors who believed European recession was not a cause of worry anymore or that US fiscal debates were now over. Most likely, the HY market rally had simply overextended itself going into December and January, and now the hottest trend-chasing money is making a withdrawal.

Ground control, we are approaching the Coffin's Corner

This most recent pullback signifies how unstable the market is becoming at its current valuations. To borrow the term from aerodynamics, we view these levels as forming the "coffin corner" for HY, a term referring to the altitude at which an aircraft becomes nearly impossible to keep in stable flight[1]. It defines the situation, where the current speed is both the *minimum* required to maintain level flight and at the same time also the *maximum* speed at which air can travel over wings without losing lift. Such a combination does not affect planes flying at normal altitudes, but applies to those ascending to critically high levels, often exceeding 60 thousand feet. This reminds us of a place where the HY market finds itself today – a point where the positive momentum is required to maintain continued demand for the asset class, and yet producing such positive momentum would imply pushing the market valuations further beyond any reasonable levels, thus undoing the very reason for being aggressive in buying risk at these levels. An unstable combination indeed.

Making less out of spread targets

Turning to specific levels, we have seen the market touching on our target spread level of 475bp in late January, before retreating to 500bps today. We withheld our inclination to tweak the number at that point because we viewed the pace of December-January gains as being too far, too fast. Now that the market has stepped back a bit and facing the realities of poor technicals (strong issuance into weak flows) and overall jitteriness of being exposed to duration at the time where concerns about rising rates are dominating the airwaves. Our view remains that pure credit tightening in HY is now mostly behind us. As we outlined this in our year-ahead report in early December, 25-50bp out of 125bp in expected spread tightening could have come from pure credit move, aside from any rate reactions. By now, we believe this part of our outlook is mostly behind us, save for the recent 1pt pullback. Going forward, HY spread continues to maintain meaningful capacity to tighten, but only into rising rates, thus without producing any price appreciation. In fact, we believe the market is losing its capacity to offset bps-for-bps increase in rates, and thus likely to start producing price markdowns into rising rates. Thus, the spread target itself should be a less relevant benchmark for HY going forward, as it becomes largely a function of rate and not credit view. We discuss HY's rate sensitivity in greater detail later in this report.

[1] In aerodynamics, the coffin corner (or Q corner) is the altitude at or near which a fast fixed-wing aircraft's stall speed is equal to the critical Mach number, at a given gross weight and G-force loading. At this altitude, the airplane becomes nearly impossible to keep in stable flight. The word "corner" refers to the triangular shape at the top right of a flight envelope chart where the stall speed and critical Mach number lines come together. Source: Wikipedia.

Expecting March madness in DC

Among most notable developments in US fiscal negotiations we have seen a quick agreement to "suspend" the debt ceiling enforcement through mid-May signed into law earlier this week. This implies that the possibility of the US failing to honor its financial obligations has now been significantly diminished and pushed back probably into mid-summer, as the Treasury would likely deploy its customary set of "extraordinary" measures again. The fact that the debt ceiling is now off the table as a subject of political debate is very encouraging, and yet it also suggests that the real fights are being saved for the sequester talks in late February and continuing funding resolution in late March. Given the differences in positions between the two parties on having further revenues part of the equation on balancing the budget, we remain of the view that it is very unlikely to see these issues resolved without stepping over one of those deadlines. In our opinion, late March funding resolution represents the most likely timing when these negotiations reach their tipping point. Such timing, if materialized, implies that the market still has some room left in the near-term to continue pushing higher without having to react to approaching risks. This push, of course, would prove futile at the end, in our opinion.

Remember European debt crisis?

European situation has also returned to the front pages of financial press in recent days after being off the radar in the last two months. Concerns about Italian elections later this month and the generally weak economic environment has pushed yields on peripheral bonds and financials higher again. In our opinion, the situation continues to evolve as expected, as we highlighted both of these risks in our year-ahead outlook as something that is likely to make a comeback as the year progresses. To us, the bottom line on Europe remains that the crisis there has changed its form – from acute/systemic phase pre-Draghi move in July 2012, to plain-old recession that comes as a product of deep austerity measures pushed on otherwise uncompetitive economies. The most likely resolution to this would be continued economic contraction throughout 2013 coupled with gradual slippage on austerity targets announced earlier. This combination implies the debt crisis will remain in its current slow-boiling phase for some time to come. As we said before, we see no need of turning excessively bullish on EU HY against the US, at the time when the former also yields less then the latter. And no, sector/quality differences are not explaining this. Chances of underperforming a global HY benchmark by staying underweight EU today are significantly less than they were last year. YTD performance differential at over 125bps in favor of US is already proving this point to be correct.

Chasing elusive spread beta

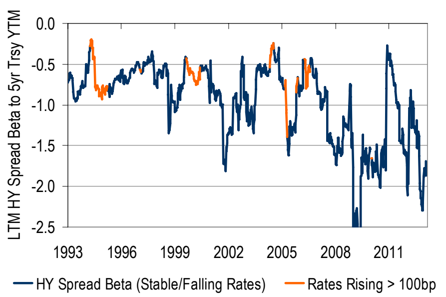
One of the most frequent topics of discussion we are engaged in with clients these days is how to properly define the framework of thinking about HY market's sensitivity to rising rates. The main difficulty in estimating current sensitivity to rates is that we do not have a good historical precedent, where HY valuations, especially yields, were anywhere close to their current levels. In our earlier work, we relied on a limited sample of post-2009 history where spreads stood at sub-500bp levels to estimate HY spread beta at 0.85x against 5yr yields. We accepted that this analysis could however be challenged by the fact that even at those levels valuations were not as stretched as they are today. In other words even if we used the tightest spread periods post-2009, yields and dollar prices were not at their present record levels yet. We have attempted to adjust for this fact by making a qualitatively-driven adjustment to our beta estimate, but we had no evidence-driven way to make this estimate more durable.

Simulating the market that never existed

We have made that next step in our analysis presented here, where we created a subindex of HY bonds that closely resembles major characteristics of the current broad market benchmark (H0A0), only as of September 2010. In other words, we have identified credits that existed back then, allowing for only narrow deviation around major metrics, such as all-in yield (5.9%), dollar price (105pts), spread (500bp), and modified duration to worst (3.7yrs). The date for creating this clone was not chosen by accident of course – we wanted to see how this basket, which very closely resembles all major characteristics of today's HY market – performed in the subsequent five-month period, when 5yr rates went up by 120bps.

In other words, this experiment allows us to simulate how a portfolio of bonds that closely resembles all the major characteristics of the current HY bond market performed in an environment of rising interest rates. Our experiment resulted in average spread beta of -0.7x for the five-month period, with quality segments producing a -0.5x, -0.7x, and -0.6x betas in BBs, Bs, and CCCs respectively. While below-market beta in CCCs may come as a surprise, it should be taken into consideration in conjunction with correlation, which stands at only 40%, compared to 75% level in BBs and Bs. In other words, lower beta in CCCs also has much lower significance for this category. In absolute terms, CCCs tightened a lot more than the market in Oct 2010-March 2011 period.

Figure 1: HY spread beta to rates tends to slump once rates start moving too fast

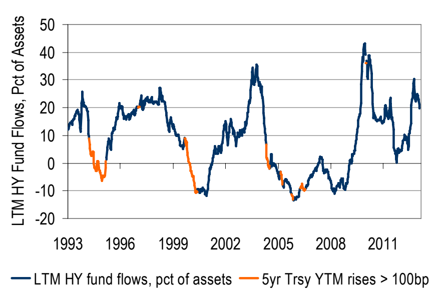


Source: BofA Merrill Lynch Global Research

Hear that whooshing sound? It's the sound of beta disappearing

One of the lesser-known and, in a sense, unfortunate sides of the HY spread beta to rates is that it tends to shrink exactly when investors need it most. The best way to demonstrate this point is by examining the chart in Figure 1, where we show trailing-12-month spread beta to 5yr Trsy YTM. Orange segments on this line represent LTM periods when 5yr rates were rising by 100bp or more. While HY beta tends to oscillate around -1.0x most of the time, meaning a near-perfect 100bp offset for 100bp rise in rates, each of the five orange segments on this chart originates[2] at values <1.0x. In fact four out of five also end up in the sub-1.0x zone, with the only exception being spring of 2005, when, as some of our readers will recall, a more aggressive Fed's stance coincided, likely by pure chance, with GM becoming a fallen angel, and triggering what the market participants referred to as a "correlation scare". The conclusion here is that most if not all of the times, HY finds itself with betas well below 1.0x once rates start moving rapidly. The average beta in all orange segments on this chart comes down to -0.65x, and it is well visible how orange lines can spend good chunks of time at sub-0.5x levels.

Figure 2: Rapid rate increases tend to derail HY flows



Source: BofA Merrill Lynch Global Research, Lipper, EPFR

HY fund flows reversed in each prior instance of rate jumps

HY fund flows also tend to be relatively resilient to smaller rate moves, but have a tendency to reverse abruptly once rates start rising in meaningful increments. Here, we look at Figure 2, which plots the long-run history of HY flows measured on a trailing-12-month basis in percent of assets terms. Once again, we use orange highlights to specify those LTM periods when 5yr rates went up by 100bps or more. As many of our clients have heard us discussing this point recently, the chart demonstrates how both 1994 and 2004-05 outflows have been triggered by sharply rising rates. The latter was further boosted by GM/F downgrade, but that was just incidental, not the real reason for flows turning deeply negative in the

[2] The word "originates" here is key, as the line measures trailing-12-month periods, meaning that by the time line "turns" orange, rates have already been rising for 12 months. Please note this in interpreting the graph.

first place. Interestingly, even 1999 – a year that did not really register as a great rate backup – has seen the 5yr jumping by 120bp between April and October, and triggered a nearly 4% outflow from HY even before the earliest canaries started singing the tech-bubble-is-about-to-burst song.

Case-by-case analysis of previous strong rate moves

We dig deeper into each instance of significant increases in 5yr rates going back to 1994 in Figure 3 on the left. Here, the table presents each instance defined by starting and ending months of rate moves alongside with actual changes in 5yr YTMs, HY spreads, total returns (TRs) on both, as well as corresponding performance in S&P500 (SPX), and fund flows in both HY and equities (in pct terms). Finally, we also calculate the HY spread beta to 5yr move in each case.

Figure 3: Four largest rate moves and their impact on HY

	YTM/Spread			Total	Fund
	Feb 94	Nov 94	Δ	Return, %	Flows
5yr Trsy	5.11	7.81	270	-5.9	
HY	403	352	-51	-4.1	-6.9
SPX				-6.6	12.0
Spread beta			-0.2		
	Apr 99	**Oct 99**	**Δ**	**TR**	**Flows**
5yr Trsy	4.94	6.15	121	-2.2	
HY	516	494	-22	-2.3	-3.6
SPX				-2.7	3.0
Spread beta			-0.2		
	Mar 04	**Jun 04**	**Δ**	**TR**	**Flows**
5yr Trsy	2.73	3.90	117	-4.5	
HY	445	405	-40	-1.3	-5.1
SPX				2.0	1.2
Spread beta			-0.3		
	Oct 04	**Mar 05**	**Δ**	**TR**	**Flows**
5yr Trsy	3.25	4.30	105	-2.7	
HY	370	310	-60	4.2	-3.8
SPX				5.7	2.3
Spread beta			-0.6		
Averages					
Change in 5yr Trsy			153		
HY spread			-43		
Spread beta			-0.3		
HY flow					-4.8

Source: BofA Merrill Lynch Global Research

There are some interesting conclusions emerging from a closer examination of this table. On average, HY spreads tightened by 43bps into 153bp increase in 5yr yields during these episodes, which translates into mediocre -0.3x beta offsets. Now, we would like to emphasize that these episodes measure the exact timing of impact of some of the worst rate jumps in the modern history of financial markets. In other words, it may be exaggerating the extent of an impact given the severity of those very episodes. Even measured on an LTM basis, betas in each one of those episodes appear to be much more stable (please refer back to Figure 1). This fine print, however, does not change the fact that at its worst, the rapid rate increase has capacity to derail HY market's ability to meaningfully offset it with spread tightening. Precisely at the time when it is needed the most.

Finally, this table further confirms something we have determined in our earlier analysis of HY flows: mutual funds were seeing net negative flows in every single period of rapidly rising rates, averaging 4.8% across all of them. Given today's asset size in this market segment, an outflow of this magnitude would translate into a $17bn outflow from weekly reporting global HY funds. This is as good a parallel as it gets to put this week's $1.2bn outflow from HY into historical perspective.

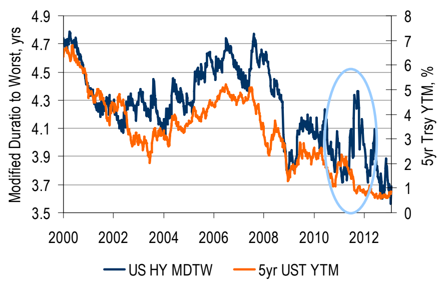
It's 1999: tech bubble against rising rates

Data on equity index performance and flows for same time intervals in Figure 3 also suggests that stock markets are not always taking the rapid increases in interest rates well. For example, S&P500 posted an average -0.4% return for all periods referenced in this table, although the range of observations was quite wide, anywhere between negative and positive 6%. Equity flows, on the other hand, were positive in every single instance described here, although their pace was still somewhat subpar. A single observation that goes against this statement – a 12% inflow in 1994 episode – has to be put into perspective of overall excitement with equities in 1990s. On average, equity mutual funds were getting 14% inflow in any given 10-month period during that decade, so in a sense, a 12% inflow during the Feb-Nov 1994 window was somewhat below that trend line. This of course, puts the 3% inflow between Apr-Oct 1999 – arguably the most egregious period of overvaluation in equities in modern history – to shame. Equity flows in the next two episodes – 2004 and 2005 – were 1.2 and 2.3% of assets respectively. To us, this historical experience suggests that while equities maybe an ultimate destination of investor flows in environment of consistently rising interest rates, it is unlikely to happen in its early stages when the market initially prices out years of ultra-easy Fed policies. The only consistently safe places we see in these periods are floating-rate instruments and cash. Equities almost certainly stand as the next beneficiary of investor interest, once the initial repricing of current interest rate environment takes place.

What happens to duration when rates rise?

Another important question that comes to mind in the context of rate sensitivity is the presently negative convexity in this market. In its essence, negative convexity reduces duration of a bond as interest rates fall and increases it as they rise. This of course is detrimental to bond investors, as they stand to benefit less from declining rates and to lose more from rising rates, all else being equal, including the extent of rate change. Convexity of the HY bond market has become negative at these levels as majority of bonds continue to trade over their call prices, thus (a) working as a factor against further price increases, and (b) increasing the probability of a bond being called, thus shortening its duration. The more rates/spreads fall the more such negative convexity kicks in. Of course, with all-in yields being at never-before-seen five-handle levels, the degree of its impact is very significant.

Figure 4: HY duration in times of negative convexity



Source: BofA Merrill Lynch Global Research

Figure 4 demonstrates the historical relationship between modified duration (to worst) of the US HY index against the 5yr Trsy yield. The chart confirms a very strong correlation between the two, and also helps us get a step closer to understanding exactly by how much the duration of our index would rise if rates started shifting higher. The blue oval area around late 2010/early 2011 represents the five-month window when 5yr yields jumped by 105bp triggering a 0.3yr increase in MDTW of the index. You can also see from the chart how duration continued to increase by another 0.3yrs later that year, which came as a function of wider spreads around US sovereign downgrade in August, and thus unrelated to rate increase.

On short duration HY

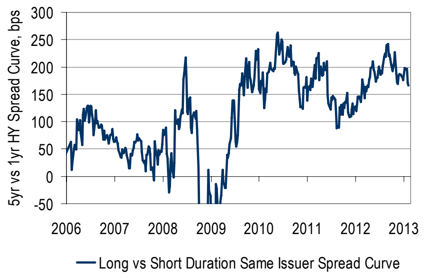
This last point – extending duration into rising rates – is an important issue at the time when short-duration HY mandates are generating such a significant demand. As yields are being squeezed across the full spectrum of maturities, the effective duration of our HY index is shortening at the time when more and more cash is being raised to invest in short-duration mandates, thus helping to satisfy the demand for such assets. However, under a scenario where rates start rising and duration extends as a function of negative convexity, such funds could face pressure in maintaining the short duration prescribed by their mandates. Additionally, the actual rate sensitivity of a portfolio where duration extends longer as a function of rising rates could show greater price sensitivity to rising rates, something that would arguably go against the historical track record for this market segment at times when negative convexity was not an issue to the extent it is today.

HY credit spread curves

As a topic related to spread betas and rate sensitivities, we are addressing the historical performance of HY credit spread curves here as well. We define the spread curve as the difference between bonds with an average of 1 and 5 yrs[3] to maturity (or worst, if callable). In doing so, we are taking bonds issued by the same legal box in each capital structure, with the same seniority, and therefore, same credit rating. We are also cutting off distressed segments, defined as bonds yields 500bp over the broad HY index. Figure 5 presents the historical differential between the two baskets, with each issuer being equally weighted in each of them.

[3] We are including all bonds from 0 to 24 months to maturity in 1yr basket and 48 to 72 months in 5yr basket.

Figure 5: Same-issuer HY 5yr-1yr credit curve



Source: BofA Merrill Lynch Global Research

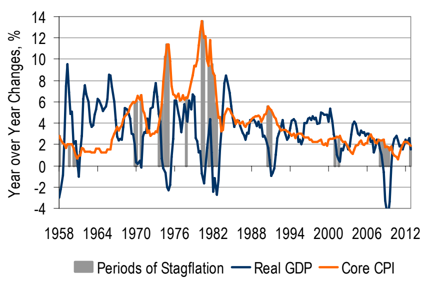
The chart shows how the credit curve spends most of the time in positive territory, with an average being somewhere in the 100-150bp range. The curve inverted around the time of Lehman bankruptcy and went deeply negative in subsequent months, peaking at over -700bp in late November 2008. Following that brief episode, the curve reverted back to its normal positive readings by April 2009, and has subsequently peaked at +250bp in June 2010 and also last September.

At the current moment, this curve stands at 170bp, somewhat wide by historical standards, but not extremely so. Thinking about optimal positioning on this curve going forward, investors should keep in mind that it is positively correlated to rates, meaning that it tends to steepen with rising and flatten into falling rates. Examples of such behavior could be seen in early 2010, as 5yr rates declined by 150bp, followed by late 2010/early 2011 increase, and then again a decline into August following US sovereign downgrade. The relationship is not perfect however, as the credit curve has steepened dramatically since Sept 2011 in the absence of any meaningful rise in rates. This latter move could be attributed, in our view, to the influx of new assets into short duration HY funds in recent quarters, thus triggering an outsized gain in the front-end of the credit curve.

All in all, we could recommend slightly overweight positioning in the longer segments of HY, with an eye towards becoming even more aggressive once 5yr yields rise further.

What if… rates were to rise for wrong reasons?

Figure 6: Longer-term view on spread betas



Source: BofA Merrill Lynch Global Research

Some of the questions around the topic of HY sensitivity to rising rates relate to the reasons behind such moves, including, for example, real growth slowing down and yet inflation picking up and resulting in stagflation. It is difficult to arrive at a definitive answer as to how HY spreads would react in such an environment, given that for the most part of its 28-year modern history the HY market has been spared exposure to such macro conditions. Predominantly, periods of stagflation are associated in our memory with 1970ies (Figure 6), when a combination of 1973 oil crisis and the dissolution of Bretton Woods currency regime led the US into recession that lasted for two years at the time when inflation continued to rise. Later in that decade, we experienced a replay of those same dynamics following the second oil shock after the Iranian Revolution.

Most modern-time HY indexes only go back to mid-1980ies, and even back then they were composed of just a handful of bonds. Therefore the only objective way we could go back to earlier times would be to use a proxy – in this case we reverted back to Baa industrial spreads collected by the Federal Reserve. While not a HY benchmark, this spread is otherwise 82pct correlated to HY since 1990s. Our goal here thus is not to measure absolute spread beta in HY but rather to show how spread beta on Baa corporates changes in various macro environments, with potentially similar implications to pure HY beta. We defined the periods of stagflation as quarters where real GDP declined while core CPI increased on a quarter-over-quarter basis. We highlight such periods in Figure 6 – note that we have also seen some short-term instances of stagflation environment even in the past two decades, albeit much less pronounced.

Measuring Baa spread beta over the whole 55yr history on this chart results in -0.4x beta for all times, -0.6x in times of stagflation (23 observations), and -0.3x in all other times (191 observations). While these results ran somewhat counterintuitive to our initial expectations, we must say that they may actually make sense if we think about this environment as the one where increased credit risk from slower economy is being mitigated by improving revenue growth due to inflation.

In other words, while stagflation is the worst possible situation for any central banker and it has negative consequences on consumer's purchasing power, it may actually be somewhat more forgiving on corporate balance sheets, a result that is exemplified here by stronger spread betas. Again, taking all the precautions necessary in interpreting the data from those periods, we point to Moody's speculative grade issuer default rate that has never exceeded 4% in the 1973-1983 decade, the decade associated with two of the deepest recessions running alongside with high inflation.

Link to Definitions

Credit

Click here for definitions of commonly used terms.

GEM Macro

Click here for definitions of commonly used terms.

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Recommendation	Investor Action Points (Cash and/or CDS)	Primary Investment Return Driver
Overweight-100%	Up to 100% Overweight of investor's guidelines	Compelling spread tightening potential
Overweight-70%	Up to 70% Overweight of investor's guidelines	Carry, plus some spread tightening expected
Overweight-30%	Up to 30% Overweight of investor's guidelines	Good carry, but little spread tightening expected
Underweight-30%	Down to 30% Underweight of investor's guidelines	Unattractive carry, but spreads unlikely to widen
Underweight-70%	Down to 70% Underweight of investor's guidelines	Expected spread underperformance
Underweight-100%	Down to 100% Underweight of investor's guidelines	Material spread widening expected

Time horizon – our recommendations have a 3 month trade horizon

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