

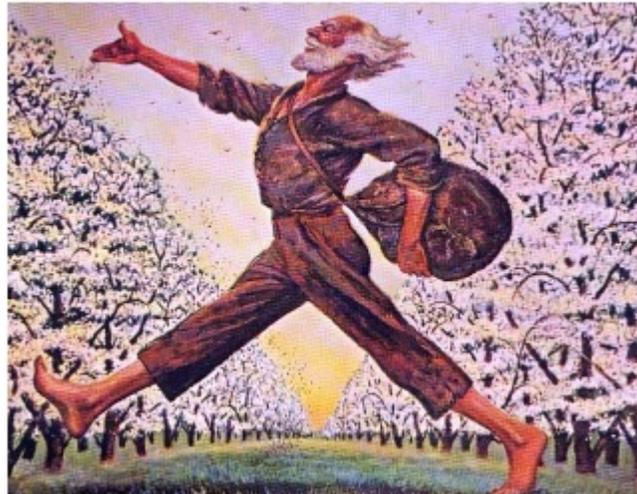
$\gamma\Gamma$

MUSINGS FROM HARLEY BASSMAN:

The Convexity Maven

Value Concepts from the BofA Merrill Trading Desk
December 8, 2010

"The Positive Carry Hedge, A Reprise"



Almost by definition, a "hedge" is supposed to cost you some sort of value. The cost can be measured in Dollars, Total Return, Net Interest Carry, or Credit Quality, but it is expected that one will give up something for the Hedge benefit. So it is quite interesting that presently one can acquire both "negative duration" (in a steep curve) and "positive convexity" for what seems to be positive carry.

Let me detail those two risks before we go any further. As we have spoken about in the past, there are three main risk vectors available in the Debt Markets: Duration, Credit and Convexity. Duration is a bond's price risk given a change in rates. In a steep Yield Curve, bonds with longer Durations yield more than bonds with shorter Durations. As such, these bonds exhibit "positive carry" when one owns them. One earns extra yield to be exposed to the risk that

interest rates will rise. Conversely, one would have to pay via “negative carry” to benefit if rates go higher. This is usually transacted by being short bonds. Thus, we say that being short the market is “negative Duration”. And the steeper the curve, the greater the cost via negative carry.

Mathematically, Convexity is the second derivative of some rate of change. But practically, we identify Convexity as some sort of unbalanced return. So if some asset or investment venture earns 10% under one set of circumstances and loses only 5% in a similarly opposite situation, we would call this “Positive Convexity”. If some other venture created a 15% return in one direction but lost 25% in the other, we would say this is “Negative Convexity”. In short hand, we say Positive Convexity is “long options” and Negative Convexity is “short options”. This is because a long option position can only lose the fee paid while the profit potential is unlimited – consequently, this is the ultimate in Positive Convexity. Of course there is a cost associated with Positive Convexity. In a vanilla options example, that cost is time decay, also known as Theta.

Placing both of these concepts together, one could logically deduce that the most “expensive” asset in an environment where the Yield Curve is steep and Implied Volatility is high would be a put (payer) option. Since a put option exhibits both Negative Duration (it profits if interest rates rise) and Positive Convexity (limited loss versus unlimited gain), markets should charge a high cost to own this risk profile. And usually such is the case. This cost tends to be born via exceedingly large time decay, as measured by its reduction in value over time. However, for reasons to be detailed below, we have found an investment that seemingly provides both Negative Duration and Positive Convexity, all the while producing a small positive return in the early years.

A Discounted Present Value, Not a Prediction

The derivative rates market operates under the principles of Arbitrage-Free conditions and Discounted Present Value. As such a Forward Rate is NOT the market’s best guess (prediction) of the future but rather the DPV of the spot rate curve. Similarly, the shape of the Implied Volatility surface is NOT by itself a prediction of how calm or risky the markets will be in the future, but instead are a function of various spot market supply::demand components. Currently, there are overwhelming market forces that are twisting and flexing both the Rate Curve and the Volatility Surface to extremes. This is the source of the opportunity.

Our discussion continues with reference to the table below. Yes, there are a lot of numbers, but let's take it one column at a time. Every item in the table is either an input or an output to calculate a Put Option (payer swaption) on a Ten year tail. Column (1) identifies the time to expiry of the option; they range in rows from two years to ten years. Column (2) is the mid-market At-the-Money Implied Normalized Volatility for a vanilla straddle. Column (3) is the Implied Nvol for a payer swaption with the strike noted in Column (5). Column (4) is the Forward 10yr swap rate. Column (5) is the Strike yield used. Column (6) is the mid-market option price using the inputs of the previous columns. This grid is taken directly from our unified pricing system.

1 Expiry	2 ATM Vol	3 OTM Vol	4 Fwd Rate	5 Strike Yield	6 Put Price
2yr	111nv	136nv	4.04%	6.00%	130bp
3yr	110	129	4.42	6.00	246
4yr	109	122	4.69	6.00	344
5yr	107	117	4.86	6.00	410
6yr	104	112	4.95	6.00	441
7yr	101	108	4.99	6.00	459
8yr	98	104	5.01	6.00	454
9yr	95	100	4.99	6.00	445
10yr	92	97	4.97	6.00	433

Notes:

Spot = 3.11%
Mid-Market Levels

All charts, unless otherwise noted, are sourced from BofA Merrill data

Funny Rates

In a world with a steep spot Yield Curve, the forward rates produced tend to be higher than spot rates. This differential is the Net Present Value of the Carry not earned by owning the spot instrument. However, notice the Forward rates in Column (4) for the years eight to ten. These rates are basically unchanged. The reason for this is the anomaly that the slope of the Yield Curve from years ten to twenty is not proportionally as steep as the slope from years zero to ten. This exists because of investment demands driven by the regulatory/accounting needs of long liability managers. (A symptom of this is the positive swap spread of about 15bps in the ten year sector versus the negative 30bps swap spread in the thirty year sector.) But whatever the reason, the end result is that the cost of negative duration in forward space, when measured via the street standard of "roll down", is almost costless.

Funny Volatilities

It is no surprise that the peak of the Implied Volatility surface occurs near the three year expiry. This is because it is this point that most closely matches the risks inherent in the MBS market. What is surprising to those not deeply involved in the derivatives market is the steep negative slope for ATM options from the three year point to the ten year point. (See Column (2))

The reason for this is the large supply of ultra long-dated options created by the issuance of Trust Preferred bonds. The beauty of these bonds, from the issuers standpoint, is that while the coupon payment is treated like Debt and is tax deductible, the principal proceeds can be treated as Equity Capital. This bifurcation of treatment is a powerful incentive for many financial institutions and rationalizes their effective sale of ten year options at presently a 17% discount to three year options (92Nvol vs. 111Nvol.)

The Positive Carry Hedge

As noted at the outset, Rate derivatives are the Discounted Present Values of the spot Yield Curve and Swaption Surface. So with no tricks or crazy conditions, the prices in Column (6) are produced. Using the standard Wall Street analysis of pure "roll down", the expected heavy time decay occurs in all the options with expiries within five years. For example, the four year to three year "roll down" cost is 98bps (344bps to 246bps) or fully 28% of the value of the option. But notice the cost profile of a ten year swaption. Its initial mid-market value of 433bps actually rises over the first three years.

Now I will stipulate that fully unchanged markets for three years are beyond a fairy tale. Nonetheless, one has to start the analysis someplace and pure "roll down" is not the worst. This trade carries at a positive 26bps over its first three years in a static analysis while having the properties of Negative Duration (in a positively sloped Yield Curve) and long Convexity. Contrast this to most positive carry trades that almost uniformly include selling options or trading against the forwards. This trade is NOT magic; in fact you will certainly pay a Princely bid/offer to enter into it. It is available because the Spot Yield Curve is slightly twisted and the Swaption Surface is so completely inverted.

The Exit Strategy

Long-time readers know that we are supremely bearish on long USD interest rates. We know that Inflation is the ONLY solution to our current Financial Crisis and this will eventually increase long Rates. Consequently, we do not need to wait the full ten years to profit on these trades; the Yield Curve and the Volatility Surface can do the heavy lifting for us.

- 1) There will be little time decay during the first few years of this trade. As such, there is plenty of time for our idea to work.
- 2) An inverted swap spread curve (22bp for 2s, 15bp for 10s, and -30bp for 30s) is dampening the "Forward Effect". Normalization will move distant forward rates higher.
- 3) Regulatory changes may dampen the ability to issue Trust Preferreds; this will reduce the "inversion" of the Volatility Surface.
- 4) Expansion of QE2 would apply more pressure to long rates

I expect this trade to coast along for six to eighteen months and then kick in hard. At least that's the plan.

The Risks

- 1) Let's be clear, these are NOT cash tens that trade like water. There is a fair bid::offer that must be paid at inception.
- 2) You are long Vega. However, Implied Volatility is near its long term average. (The MOVE index at 103 equals its 20 year average.
- 3) The "Cassandra" pundits are correct and we do become Japan -- Well, losing your small option premium will be the least of your worries !!!
- 4) This is NOT a "relative value" trade; it is a Macro investment with a two to three year horizon.

We repeat: Since inflation is the ONLY solution, it will be the solution. It is just a matter of time. This low dollar cost investment offers superior hedge value at what is analytically zero cost. Take advantage of today's twisted risk Vectors to protect yourself now.

Harley S. Bassman
BofA Merrill US Rates Trading
December 8, 2010



Important Information Concerning Trading Strategists and Desk Analysts

Trading desk analysis or materials ("Trading Strategy") has been prepared by a member of the trading desk who supports underwriting, sales and trading activities. Trading Strategy is provided for information purposes only and is not a solicitation or offer for the purchase or sale of any security or other financial instrument. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or financial instrument or the information in the prospectus or other offering document issued in connection with such offering and not on this document. Trading Strategy prepared by desk analysts is based on publicly available information with the exception of information regarding BofA's own positions in securities and financial instruments. Facts and ideas in Trading Strategy have not been reviewed by and may not reflect information known to professionals in other business areas of Merrill Lynch, Pierce, Fenner & Smith Incorporated, Bank of America, N.A., Banc of America Limited or any of their affiliates (collectively, "BofA"), including investment banking personnel. Although information has been obtained from and is based on sources believed to be reliable, we do not guarantee its accuracy, and it may be incomplete or condensed. All opinions, projections and estimates constitute the judgment of the person providing the information as of the date communicated by such person and are subject to change without notice. Prices also are subject to change without notice. Neither BofA nor any officer or employee of BofA accepts any liability whatsoever for any direct, indirect or consequential damages or losses arising from any use of Trading Strategy.

FOR U.K. CUSTOMERS: Trading Strategy is a Marketing Communication under the rules of the UK Financial Services Authority ("FSA Rules") and falls within the definition of non-independent research under the FSA Rules. This document has been prepared for market professionals meaning persons who have professional experience in matters relating to investments falling within the meaning of Article 19 of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 without regard to your particular circumstances. Any investment or investment activity to which this document relates is available only to such persons and any decision to purchase or sell a security is made by you independently without reliance on us. Persons who do not have professional experience in matters relating to investments should not use this document. This document is not being held out as being impartial in relation to the activities of our trading desks. It has not been prepared in accordance with U.K. legal requirements designed to promote the independence of investment research and is not subject to any prohibition on dealing ahead of the dissemination of investment research. This transmission is confidential; intended only for the use of the addressee named above and should not be forwarded. *If the reader of this message is not the intended recipient you are hereby notified that any dissemination, distribution, copying, or other use of the Trading Strategy is strictly prohibited.*

FOR U.S. CUSTOMERS: Trading Strategy is NOT a research report under U.S. law and is NOT a product of a fixed income research department of BofA. It is provided to you without regard to your particular circumstances, and any decision to purchase or sell a security or financial instrument is made by you independently without reliance on us.

Important Conflicts Disclosures

Investors should be aware that BofA engages or may engage in the following activities, which present conflicts of interest:

- The person distributing Trading Strategy may have previously provided any ideas and strategies discussed in it to BofA's traders who may already have acted on them.
- BofA does and seeks to do business with the companies referred to in Trading Strategy. BofA and its respective officers, directors, partners and employees, including persons involved in the preparation or issuance of Trading Strategy (subject to company policy), may from time to time maintain a long or short position in, or purchase or sell a position in, hold or act as market-makers or advisors, brokers or commercial and/or investment bankers in relation to the financial instruments discussed in currency or rates Trading Strategy or in securities (or related securities, financial instruments, options, warrants, rights or derivatives), of companies mentioned in Trading Strategy or be represented on the board of such companies. For securities or financial instruments recommended by a member of the foreign exchange department in which BofA is not a market maker, BofA usually provides bids and offers and may act as principal in connection with transactions involving such securities or financial instruments. BofA may engage in transactions in a manner that is inconsistent with or contrary to any recommendations made in Trading Strategy.
- Trading desk analysts or strategists who prepare Trading Strategy are compensated based on, among other things, the profitability of BofA's sales and trading activity in securities or financial instruments of the relevant asset class, its fixed income division and its overall profitability.
- The person who prepares Trading Strategy and his or her household members are not permitted to own the securities or financial instruments mentioned.
- BofA, through different analysts and strategists or its debt research department, may have issued, and may in the future issue, other Trading Strategy that is inconsistent with, and reaches different conclusions from the information presented from the subject Trading Strategy as a consequence of the different time horizons, other assumptions, views and analytical methods of the persons who prepared them and BofA is under no obligation to bring them to the attention of recipients of the subject Trading Strategy.

FOR U.K. CUSTOMERS: We have a policy and organisational and administrative arrangements to manage these and other conflicts of interest arising in our business in accordance with the FSA Rules.

Trading Strategy is distributed in the U.S. by Merrill Lynch, Pierce, Fenner & Smith Incorporated, member FINRA and SIPC. Trading Strategy is distributed in Europe by Banc of America Securities Limited ("BASL"), a wholly owned subsidiary of Bank of America, N.A. BASL is a member of the London Stock Exchange and is authorized and regulated by the Financial Services Authority.

© 2010 Bank of America Corporation