

Market Facts

Is Convexity An Issue?

By James A. Bianco (847) 304-1511
March 11, 2005

With 10-year yields moving above 4.50% for the first time since last August, the question arises whether the convexity trade is back. This is a bit of a twist from the past; this question arose previously in falling interest rate environments.

What Is The Convexity Trade?

The convexity trade gets its name from a defining characteristic of the mortgage market – “negative convexity.” As overall market yields rise, the duration of the mortgage index also rises or lengthens. Duration has many measures and meanings. For the purposes of this discussion, the “modified duration” definition works best. **It measures how sensitive price movements are to changes in interest rates.**

That mortgage prices become more sensitive to rising interest rates (falling prices) is not a good thing for their owners. This is why they are said to be “negatively convexed.”

This negative convexity is due primarily to mortgage refinancing. When yields fall, homeowners rush to refinance their mortgages. Since mortgage securities “pass-through” refinancing to their investors, this has the effect of speeding up mortgage repayments. Duration is shortened, and prices rise less than they would otherwise in a falling yield environment. In extreme cases, an investor who bought a mortgage security believing he would get interest payments over **many** years might wind up with significantly fewer payments than anticipated. Payback would be compressed into a **few** years. If this investor paid a price significantly over par (100) for this security in anticipation of this security paying interest for many years, a loss will occur. This is why mortgage investors often run into problems when rates fall as opposed to when they rise.

What exactly is the convexity trade? Simply, it is an effort to keep the overall duration of a bond portfolio stable.

For example, an insurance company attempting to match their bond portfolio's asset and liability

durations may have a significant portion of their portfolio in mortgage securities. When yields fall, the negative convexity of the mortgages will cause the duration of their portfolio's assets to decline faster than the duration of their liabilities. When this happens, many of these managers who have a goal of keeping the duration of the portfolio asset and liabilities equal will seek to replace this lost duration by purchasing other long-dated fixed-income assets, such as Treasuries, which always have “positive convexity,” or interest rate swaps. The opposite holds true when interest rates rise. Here the duration of the portfolio's assets lengthens faster than their liabilities' duration. The manager now has an incentive to sell long-duration assets to reduce the portfolio's duration.

A more detailed explanation of this trade is available in our [September 2002 Special Report](#).

How Much Convexity Trading Is Going On Now?

Whenever interest rates move violently, as they have in the last week, the market wonders, “When will the convexity trade ‘kick in’?” To answer this question, one must look at the changes in the duration of a mortgage index.

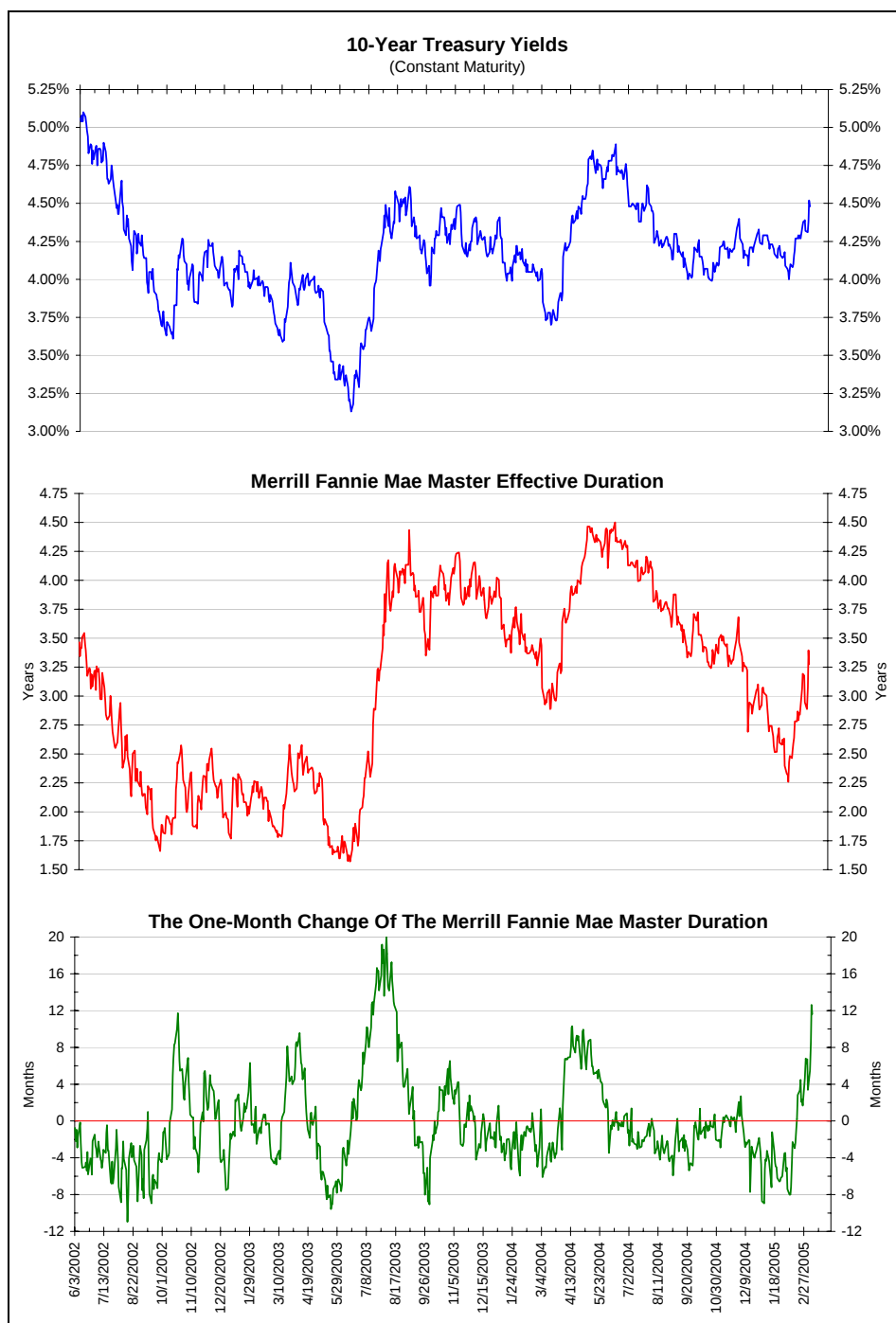
The three panel chart on the next page illustrates this concept. The top panel shows 10-year Treasury yields. The middle panel shows the *effective* duration of the Merrill Fannie Mae Master Index. *Effective* means assumptions about prepayments are included. The Fannie Mae Master Index includes only mortgage securities guaranteed by Fannie Mae. This index is over half the overall Merrill Mortgage Master Index and more consistent measure than the overall Mortgage master index. The bottom panel is a measure of duration volatility – a rolling 1-month change of the effective duration of the Fannie Mae Master Index.

The key panel is the bottom one showing the change in mortgage duration. Mortgage owners are not supposed to anticipate interest rate changes; if they do, then they are interest rate speculators. Rather they are supposed to react to changes in the mortgage index. The bigger the change in the index'

duration, the more convexity trading required to rebalance a portfolio back to initial levels.

Over the last month, the mortgage index' duration has extended by over 12 months. This is the second largest one-month move in the duration of

the mortgage index in the last 3 ½ years. **Therefore, it is reasonable to say the amount of convexity trading taking place now has only been exceeded once in the last 3 ½ years.**



The fact mortgage index duration has extended by so much given the relatively modest move in interest rates may come as surprise to many market watchers. So far the rise in yields is barely half the rise seen in the spring of 2004, yet the change in

mortgage durations is much greater. How can this be?

The table below shows the range of coupons in the mortgage market. Notice that the vast majority of

coupons are in a range of only 150 basis points – from 4.5% to 6.0%.

Mortgage Coupon Ranges

As of March 10, 2005

Coupon Range	Mortgage Master Index	Merrill Fannie Mae Index
4.0% to 4.5%	2.28%	2.02%
4.5% to 5.0%	11.28%	11.01%
5.0% to 5.5%	27.85%	28.05%
5.5% to 6.0%	31.48%	32.75%
6.0% to 6.5%	15.47%	15.47%
6.5% to 7.0%	7.68%	7.02%
More than 7%	3.96%	3.68%
Total	100%	100%

Source: Merrill Lynch

In addition to this tight range, the current coupon FNMA 30-year mortgage was yielding 4.88% on February 9. One month later, March 9, it was yielding 5.36%. So, mortgage interest rates are moving right through the heart of this tight coupon range. This means every basis point move in mortgage interest rates is having a bigger impact on the duration of the overall mortgage index than ever before. This is how a rise in interest rates half the size of the spring of 2004 is producing a larger change in mortgage durations.

Conclusion

The convexity trade does not start a trend - it exaggerates it.

Given the tight ranges in mortgage coupons and the fact that interest rates are moving through the heart of these ranges, the current 50 basis point rise in yields is having a bigger impact on the duration of the mortgage index than we saw with similar 100+ basis point rises in interest rates just a year ago. This is resulting in one the biggest convexity trading opportunities on the bond market in the last 3 ½ years.

Bianco Research L.L.C.

1731 North Marcey, Suite 510
Chicago IL 60614

Phone: (847) 304-1511 Fax (847) 304-1749
e-mail: research@biancoresearch.com
<http://www.biancoresearch.com>

For more information about the contents/ opinions contained in these reports:

President (847) 304-1511
James A. Bianco jbianco@biancoresearch.com

Strategists/Analysts (847) 304-1511
Howard L. Simons hsimons@biancoresearch.com
Greg Blaha gblaha@biancoresearch.com
Neil Bouhan nbouhan@biancoresearch.com

For subscription/service Information:

Arbor Research & Trading, Inc.
Director of Sales & Marketing (800) 876-1825
Fritz Handler fritz.handler@arborresearch.com
Patrick Lovett pat.lovett@arborresearch.com
Peter Forbes peter.forbes@arborresearch.com

Arbor Research & Trading, Inc.

1000 Hart Road, Suite 260
Barrington IL 60010

Phone (847) 304-1560 Fax (847) 304-1595
e-mail inforequest@arborresearch.com
<http://www.arborresearch.com>

For more information about Arbor Research & Trading and its services:

Director of Fixed-Income Sales (800) 876-1825
Daniel Lustig dan.lustig@arborresearch.com
Director of International Sales (847) 304-1560
James L. Perry james.perry@arborresearch.com

Arbor Research & Trading (UK) LTD

75 Cannon Street London England EC4N 5BN
Phone 44-207-556-7309 Fax 44-207-896-1887

For more information:

Director of Arbor (UK) 44-207-556-7309
Neil Tritton neil.tritton@arborresearch.com
Ben Gibson ben.gibson@arborresearch.com