

# The 30s Swap Spread Puzzle

**USSP30 -19.25 -1.25 ANON -20.25/-18.25 ANON** Message

At 04:16 Op -18.00 Hi -18.00 Lo -19.75 Prev -18.00

USSP30 CMPN CURRENCY Hide GP - Line Chart Page 1/4

Range 07/14/08 - 01/12/09 Upper Market Price Mov. Avgs Currency USD

Period Daily Lower None Mov. Avg 15 Source CMPN Events



## Fundamental Value and the Swap Spread Anomaly

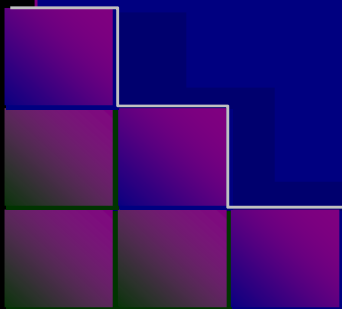
Arvind Krishnamurthy

Many pundits and policymakers think that asset prices have deviated from “fundamental values” and that this deviation is part of the problem affecting financial institutions. For example, if mortgage and credit assets, which banks hold in plenty, are currently priced below “fundamental values,” then banks will be assessed larger losses than they otherwise would. This in turn can lead to concerns of banks defaulting, etc. In other words, the dysfunctionality of asset markets is part of the problem in the current financial crisis.

But, what is fundamental value, and how can one make these sorts of statement? The notion that one can accurately assess “fundamental value” on the most toxic mortgage-backed securities should be rightly treated with some suspicion. However, there is considerable evidence that arbitrage forces, which we normally take to be the key enforcer of fundamental value relationships, are not present in today’s environment. This is circumstantial evidence for fundamental value deviations.

Below I discuss two pricing relationships which reflect these distortions. The examples are somewhat involved; but bear with me because they are not as complicated as they sound, and they are illuminating.

Figure 1: Swap Spreads (source: Federal Reserve)



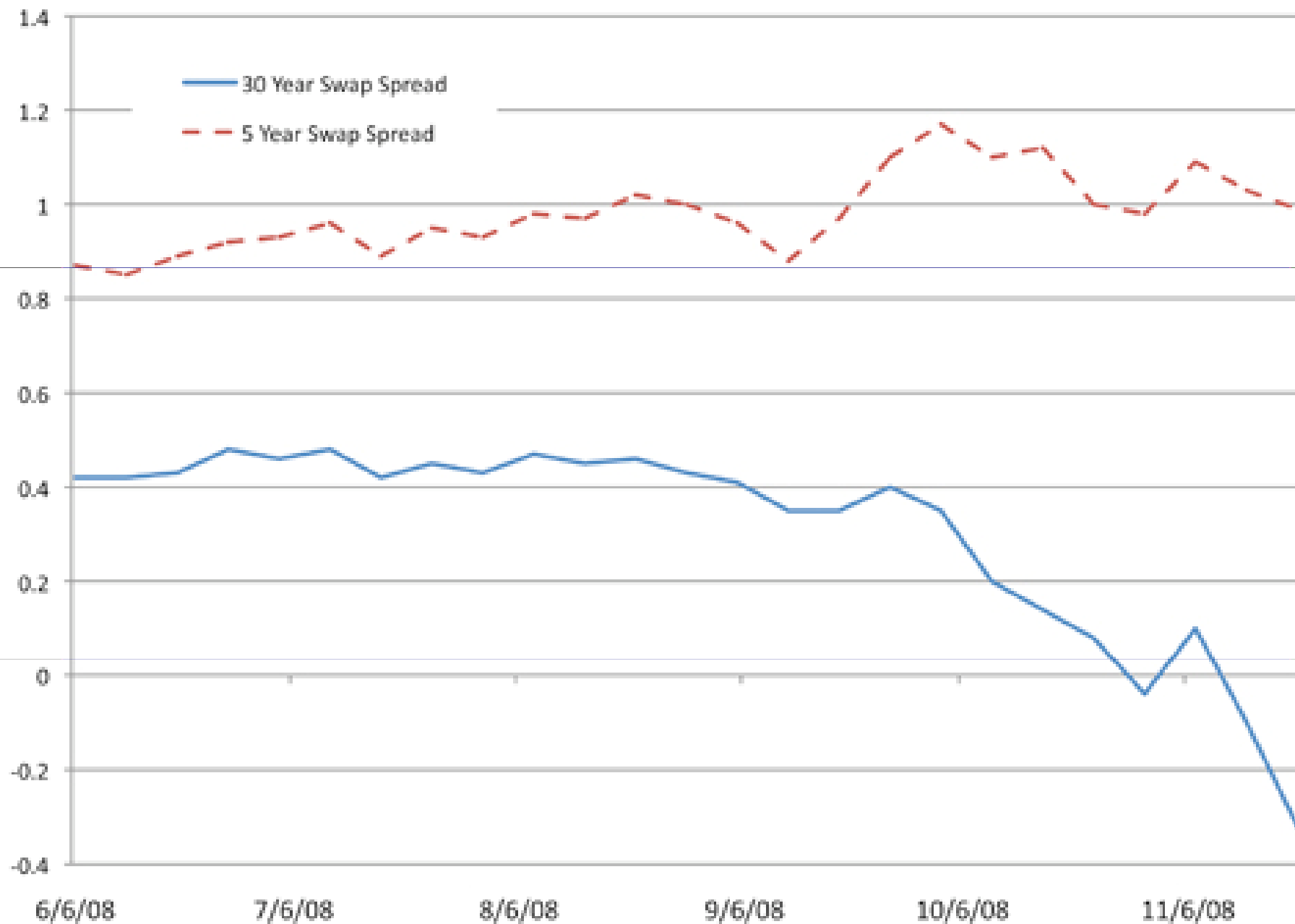


Figure 1 graphs the interest rate swap spread for maturities of 5 years and 30 years. The 30 year swap spread measures the difference between 30 year Treasury rates and 30 year fixed-for-floating (LIBOR) interest rate swap rates. Since the swap rate reflects LIBOR which in turn reflects bank credit risk, swap rates are almost always higher than Treasury rates. However, since September there are a number of dates on which the 30 year swap rates have been below Treasury rates (while the usual pricing pattern prevailed for all other maturities – see the 5 year spread on the graph). For example, on November 20 the 30 year swap rate was 20 basis points below the 30 year Treasury. Market participants ascribe this reversal of the usual pattern to an unwinding of long-term swap trades by a number of players. However, the fact the spread was negative suggests that the other side of the market must have been lacking. Arbitrageurs' capital that would otherwise enter to take advantage of the negative 20 bp spread was absent.

To see why the negative spread is anomalous, consider the following trade. An arbitrageur could purchase \$100 worth of a 30 year Treasury, say at 4%. Using the Treasury as collateral, he can do a repurchase agreement where he pays the repo rate to finance this purchase, and then roll over this financing every 3 months in the repo market, paying the then prevailing repo rate. He can then do a fixed rate swap paying 3.80% and receiving 3-month LIBOR, where the LIBOR rate is reset every 3 months. The cash-flows from these trades are as follows:

*Treasury Purchase: Receive 4% per annum for next 30 years*  
*Pay 3-month repo rate, rolled every 3 months, to finance the purchase*  
*Swap Trade: Pay 3.80% per annum for next 30 years*  
*Receive 3-month LIBOR rate, reset every 3 months, for next 30 years*

First note that the trade eliminates all interest rate risk. If, for example, interest rates rise, both the 3-month repo rate as well as the 3-month LIBOR rate will rise. If they rise one-for-one, the change in interest rates is offset. The only source of interest rate risk is if they don't rise one-for-one – but as I argue, such risk works in the arbitrageur's favor in this case.

LIBOR rates have been between 100 and 300 basis points (i.e. 1% to 3%) above the Treasury repo rate recently; historically this spread is always positive and averages closer to 40 basis points. Thus, based on current values, the difference between the LIBOR receipt and the repo payment earns the arbitrageur 100 to 300 basis points currently. While this profit may revert to 40 basis points eventually, it will always remain positive. The latter is because LIBOR reflects unsecured bank financing, and repo rates reflect financing secured by Treasuries as collateral. When the financial world goes into a panic, the spread rises (as has been the case recently), so that the "risk" goes in the arbitrageur's favor. The trade also earns a fixed rate differential of 20 basis points. Moreover, if the swap spread turns positive, the arbitrageur can unwind the trade at a profit. The trade has "positive carry" and substantial upside.

Why isn't this trade being done in sufficient size to eliminate the negative swap spread? There are three considerations that may be at work here. First, the trade requires capital – haircuts and collateral for the repo and swap. There is little risk capital in the marketplace now given the losses suffered by financial institutions. Second, many practitioners have noted that the repo market is currently not functioning well; volume of trade has fallen and many money funds have withdrawn from the triparty repo market. Last, the swap is a bilateral trade with another counterparty, and given the counterparty risk concerns present currently an arbitrageur may be reluctant enter a swap. These three frictions are all possible, and the fact that they have significantly affected pricing relationships indicates *how distorted asset markets are currently*.

The latter is the key take-away from the swap spread example. If prices on such a simple trade are distorted because normal arbitrage forces do not operate, what is the state of the pricing on more complicated assets?

Let us consider an asset that is one step more complicated and also closer to the heart of the current crisis. Figure 2 graphs the option-adjusted spread on the 30-year Ginnie Mae 6% TBA mortgage-backed security (MBS). The option-adjusted spread is computed based on Bloomberg's prepayment model. The computation strips out the prepayment option component of the MBS, leaving a spread that, if the computation is precise, is the excess return one can earn from buying the MBS

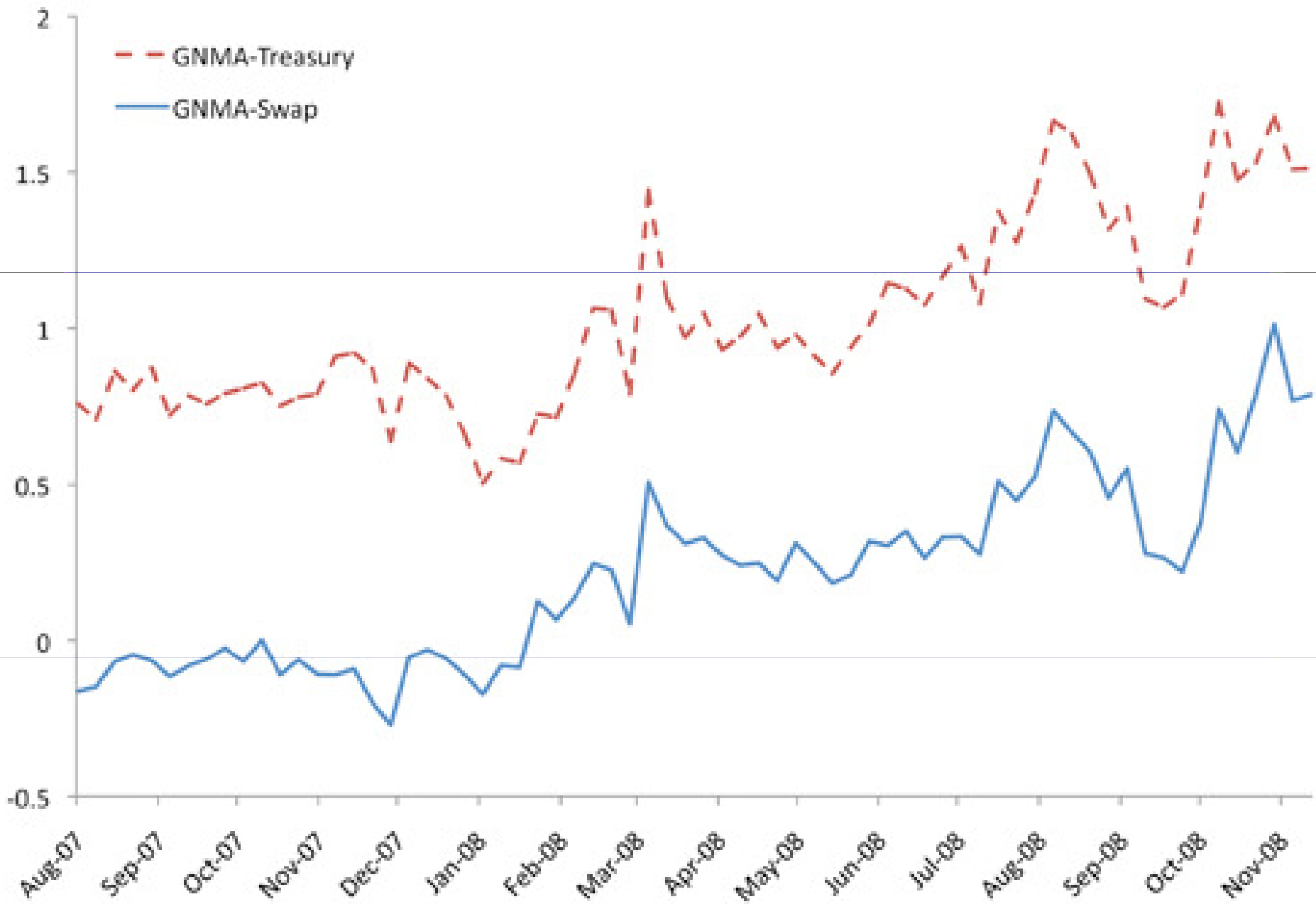


Figure 2: OAS on GNMA 6% (source: Bloomberg)

The blue line graphs the spread on the Ginnies versus the interest rate swap (i.e. LIBOR) curve. The Ginnies carry the explicit “full faith and credit of the U.S. government” and are therefore as safe as Treasuries. Moreover, if a homeowner defaults on a mortgage, the U.S. government absorbs any losses, paying par to the holder of the mortgage-backed security. Thus there is no default issue with these securities, and the risks as with all MBS, are prepayment risk and interest rate risk. Ginnies also have much higher underwriting standards than subprime mortgages, so that the typical equity buffer is on the order of 20%.

Prior to February of 2008 the spread is negative reflecting the low credit risk that comes with the explicit government guarantee. The first blip upwards in the spread is in March with the Bear Stearns event. Bear Stearns was an important player in the mortgage market, and thus one read of this graph is that the capital devoted to pricing and bearing MBS risk shrank in the Bear Stearns event. The next blip upwards in the spread is at the end of July, corresponding to the problems with Fannie Mae and Freddie Mac. Although Ginnie Mae was not directly affected in this event, the problems in Fannie and Freddie further shrank the risk-capital in the mortgage market. The spread increases again the week of September 26 (data is weekly in the graph). Note that since the spread is measured relative to swaps, and LIBOR was also affected during this event, the spread rise is not initially dramatic.

The upper (red) line in the graph reflects the MBS spread relative to Treasuries. The high spreads reflect a phenomenon that is common in crises: investors especially value the liquidity of Treasuries, pushing the spreads relative to Treasuries up on all securities. The spread patterns are broadly similar to that of the lower (blue) line. The low point in the spread occurs the week of September 12 (again, data is weekly).

These high spreads on a security which has no credit risk also points to the scarcity of arbitrage capital in the marketplace and the large effects that this shortage can have on asset prices. For financial institutions, this is important because it suggests that the value of financial claims reflecting future mortgage risk is especially low. Hence the losses on financial institutions balance sheets are larger than they would otherwise be if prices were at fundamental value. For households and the mortgage market more generally, the high Ginnie Mae spread implies that homeowner mortgage rates remain at high spreads relative to Treasuries. Thus, it helps explain why mortgage rates have remained high despite the general drop in interest rates as reflected by the Federal Funds rate or the rates on Treasuries.

If the prices on these two low-risk assets – swap spread and Ginnie Mae MBS – can be as affected by market disruptions, we can surmise that more risk-sensitive assets such as the senior tranches on subprime CDOs must be more affected. Thus, it is very likely that asset prices are far from fundamental values.

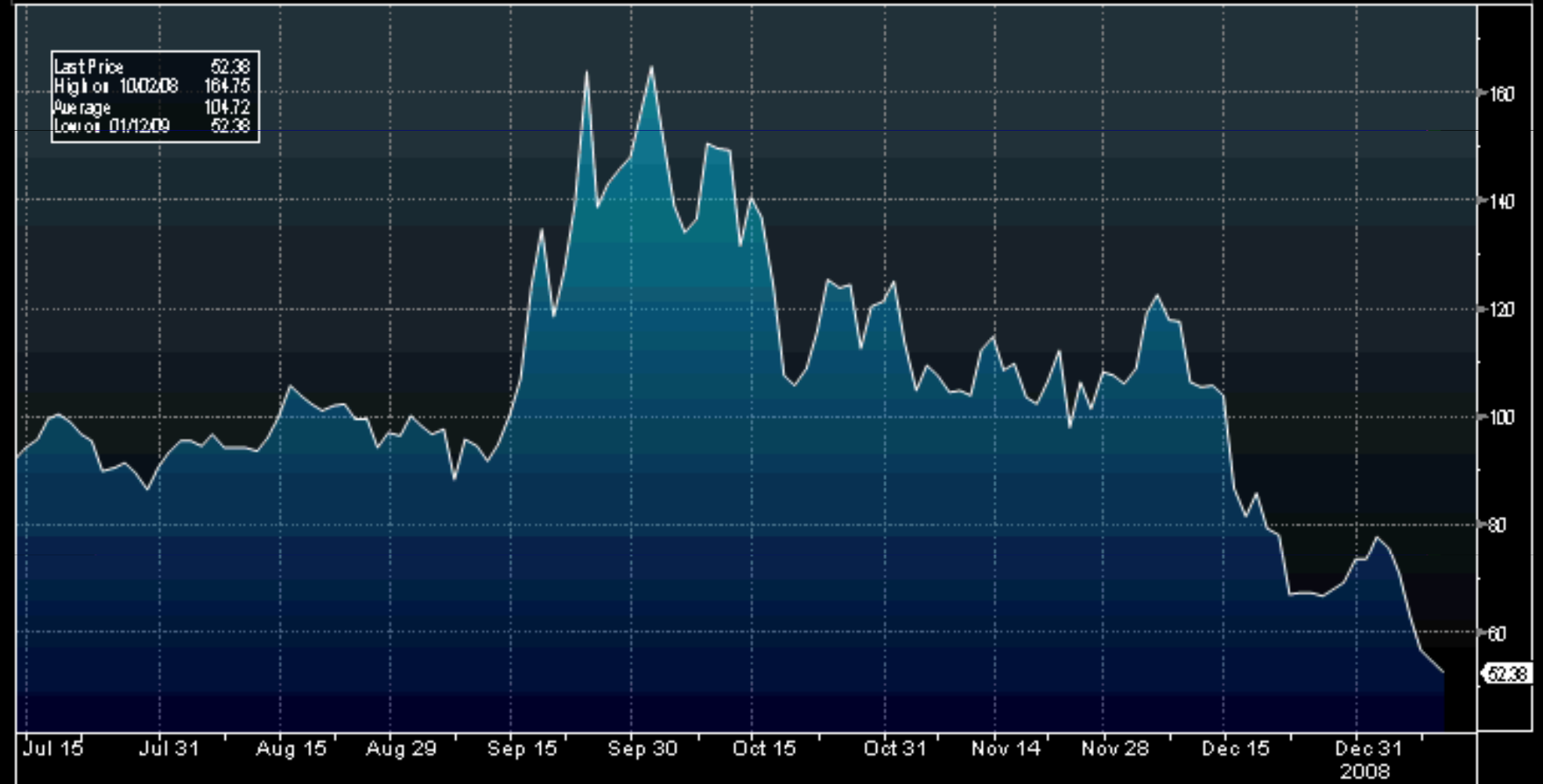
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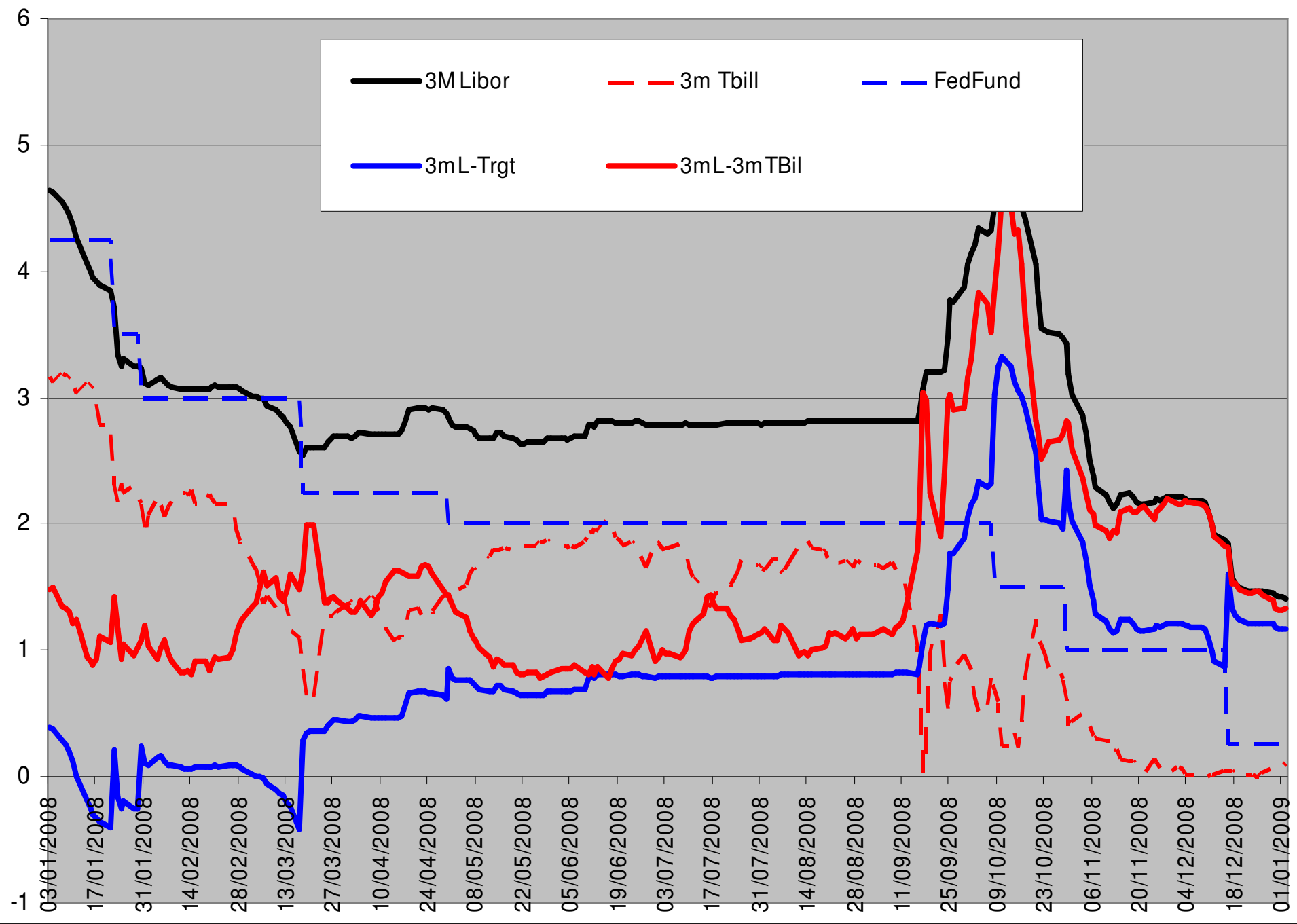
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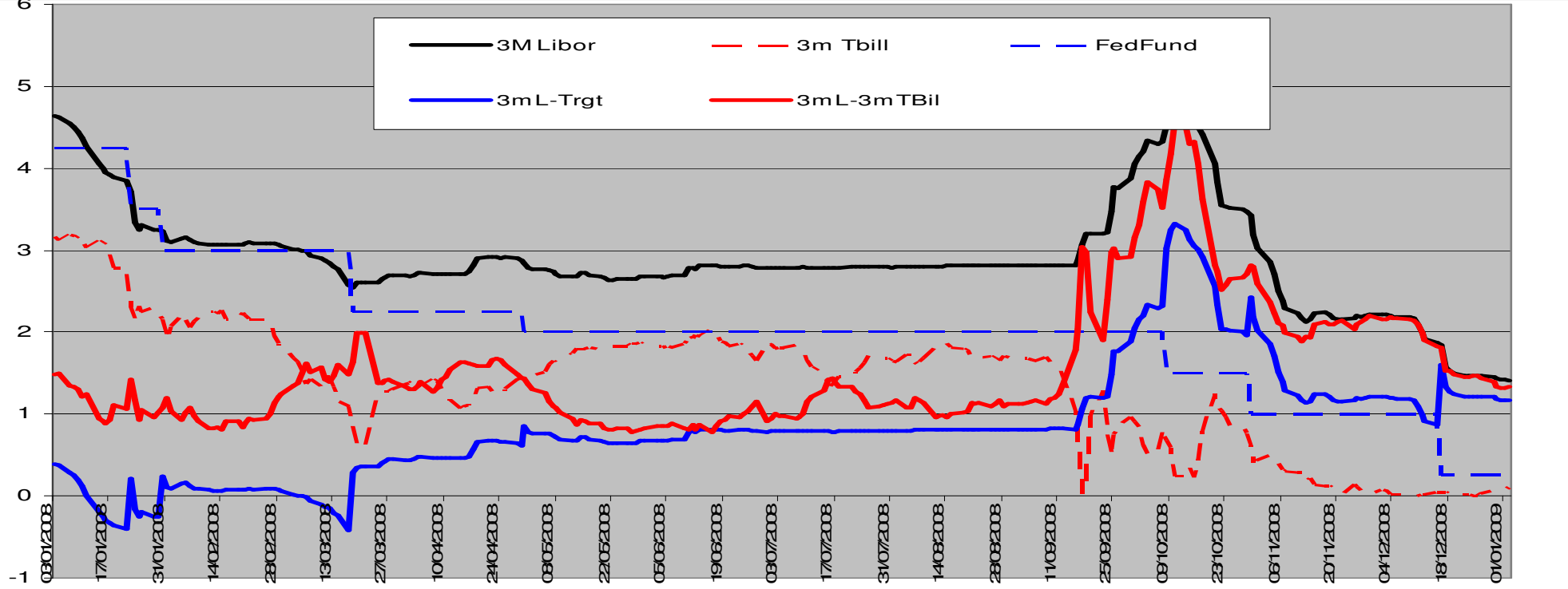
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Period Daily Lower None Mov. Avg 15 Source CMPN Events



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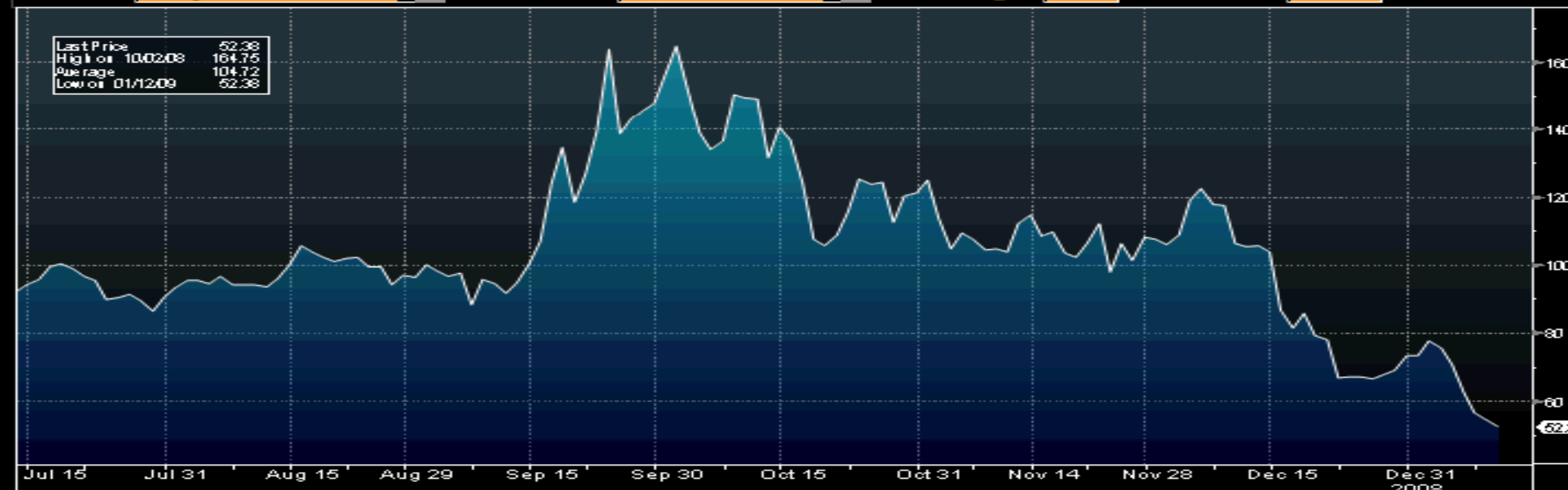
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GP - Line Chart

Page 1/4

Range 07/14/08 - 01/12/09 Upper Market Price Mov. Avgs Currency USD  
 Period Daily Lower None Mov. Avg 15 Source CMPN Events



USSP2 52.38 -1.88 ANON 50.50/54.25 ANON **Message**

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USSP2 CMPN CURRENCY Hide GP - Line Chart Page 1/4

Range 07/14/08 - 01/12/09 Upper Market Price Mov. Avgs Currency USD  
Period Daily Lower None Mov. Avg 15 Source CMPN Events



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USSP5 CMPN CURRENCY Hide GP - Line Chart Page 1/4

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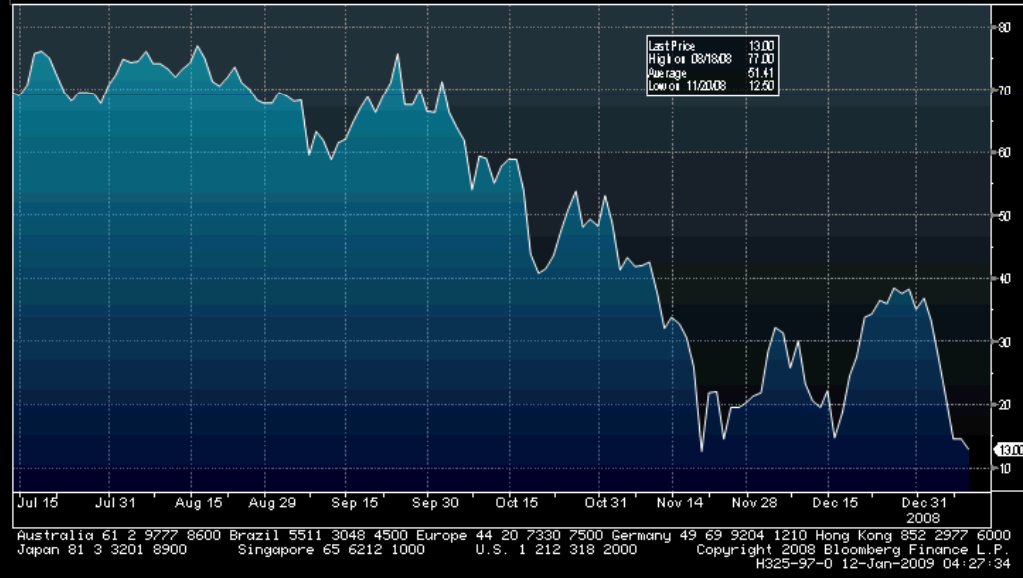


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Range 07/14/08 - 01/12/09 Upper Market Price Mov. Avgs Currency USD  
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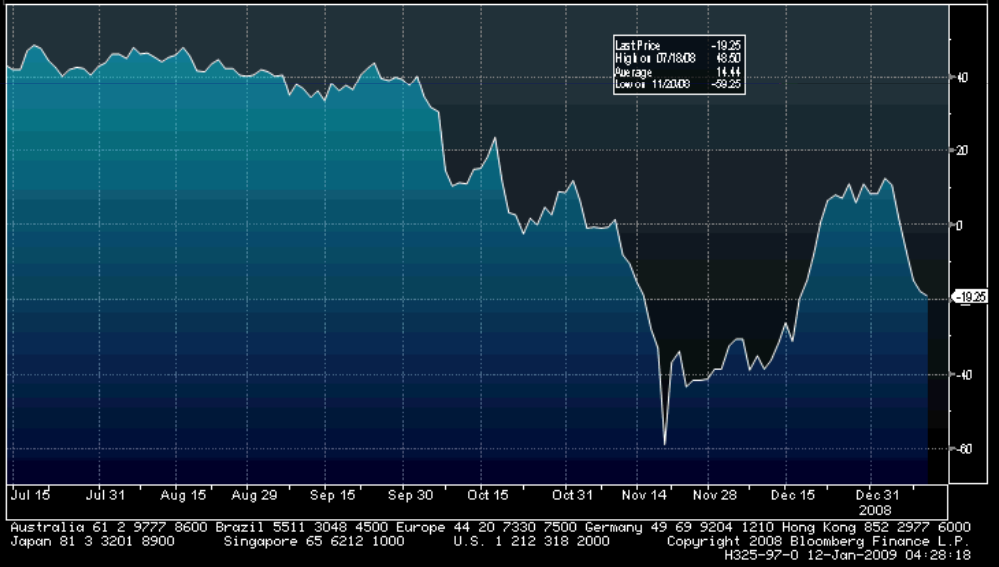


USSP30 -19.25 -1.25 ANON -20.25/-18.25 ANON **Message**

At 04:16 Op -18.00 Hi -18.00 Lo -19.75 Prev -18.00

USSP30 CMPN CURRENCY Hide GP - Line Chart Page 1/4

Range 07/14/08 - 01/12/09 Upper Market Price Mov. Avgs Currency USD  
Period Daily Lower None Mov. Avg 15 Source CMPN Events



USSP5 50.25 -1.75 ANON 49.25/51.25 ANON

CurrencyGP

At 04:24 Op 52.00 Hi 52.00 Lo 50.25 Prev 52.00

USSP5 CMPN CURRENCY Hide GP - Line Chart Page 1/4

Range 07/14/08 - 01/12/09 Upper Market Price Mov. Avgs Currency USD  
Period Daily Lower None Mov. Avg 15 Source CMPN Events



Last Price	50.25
High on 09/24/08	128.00
Average	94.66
Low on 01/08/09	49.75

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000  
 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000  
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Message

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USSP10 CMPN CURRENCY Hide GP - Line Chart Page 1/4

Range 07/14/08 - 01/12/09 Upper Market Price Mov. Avgs Currency USD  
Period Daily Lower None Mov. Avg 15 Source CMPN Events



Last Price	13.00
High of 08/18/08	77.00
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At 04:16 Op -18.00 Hi -18.00 Lo -19.75 Prev -18.00

USSP30 CMPN CURRENCY  GP - Line Chart Page 1/4

Range  -  Upper      Currency    
Period   Lower     Source   Events



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Oct. 23 (Bloomberg)

The price to exchange, or swap, floating for fixed-rate payments for 30 years fell below the yield on similar maturity Treasury bonds for the first time as dealers hedge against losses related to derivatives and financial institutions shore up balance sheets. The 30-year swap rate dropped to 4 percent, compared with a yield of 4.03 percent on a 30-year Treasury bond, resulting in a negative swap spread of 3 basis points. Swap rates serve as benchmarks for many types of debt often purchased with borrowed money, including mortgage-backed securities and auto-loan securities.

Narrower swap spreads can push borrowing costs lower even if Treasury yields are steady. Swap spreads of all maturities have narrowed in the past month after governments and central bankers worldwide introduced measures to support bank balance sheets and unfreeze bank lending, which helped the London interbank offered rate, or Libor, decline. "Part of the 30-year spread narrowing is a result of derivative hedging-related activity from exotics trading desks," said Piyush Goyal, an interest-rate derivatives strategist at Barclays Capital Inc. in New York. "It is also a result of the deleveraging of balance sheets, which has triggered selling of long-term Treasury bonds, driving those yields higher relative to swap rates." Swap rates have traditionally been higher than Treasury yields in part because the floating payments are based on interest rates that contain credit risk, such as the Libor.

#### Derivative Hedging

Financial institutions are struggling to raise capital and shore up balance sheets to regain the confidence of investors and counterparties after bad loans caused writedowns and credit losses of more than \$660 billion since the end of 2007. Hedging from trading desks that deal in sophisticated derivatives such as those linked to constant maturity swaps accelerated on Oct. 8, when the 10-year swap rate moved from about 21 basis points below the 30-year swap rate to roughly equal, according to Goyal. The hedging triggered increased demand to receive fixed rates on 30-year swaps, which serves to push rates lower. The 10-year swap rate reached as much as 24 basis points above the 30-year swap rate as of Oct. 13, before moving back to 4 percent, or 4 basis points below the 30-year rate of 4.04 percent. Bloomberg data on swap rates goes back through 1995. The narrowing of the 30-year swap spread is also related to hedging triggered by bankruptcy of Lehman Brothers Holdings Inc., according to Eric Liverance, head of derivatives strategy at UBS Securities LLC in Stamford, Connecticut.

#### Lehman Bankruptcy Link

"Pension funds need to hedge long-term liabilities by receiving fixed on long-maturity swap rates," Liverance said. "When Lehman dissolved, pension funds found themselves with unmatched hedging needs and then needed to cover these positions in the market with other counterparties. This demand for receiving fixed in the long end drove swap spreads tighter." The London interbank offered rate, or Libor, that banks charge each other for three-month loans in dollars has fallen about 128 basis points to 3.535 percent from the year's high of 4.819 on Oct. 10, according to the British Bankers' Association. Libor rates have fallen since the Federal Deposit Insurance Corp. said Oct. 14 it would guarantee new senior unsecured debt and fully protect non-interest-bearing deposits at banks to shore up confidence in the U.S. banking system. The FDIC agreed to backstop new debt issued by banks between Oct. 14 and June 30, 2009, for three years from the issue date. "It doesn't make intuitive sense to have a negative swap spread, as Treasuries are government debt and swaps are unsecured bank debt," said Suvrat Prakash, an interest-rate strategist at BNP Paribas Securities Corp. in New York. "This is happening partly as the FDIC guaranteed interbank lending, and Libor has fallen. The idea for some seems to be that the government is guaranteeing the swap rates well."