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Swap spreads uncovered

Bartholomew Pan-Kita and Graig Fantuzzi of Morgan Stanley analyse the US swap spread market and discuss how market flows and other technical forces might support or hinder the theory

What is a swap spread? For those who need a quick refresher from a definitional perspective, a swap spread is simply the difference between the yield on a government security, such as a US Treasury, and the fixed rate of a conventional fixed/floating swap with a similar maturity to the referenced bond. That is all well and good, but what we really want to know is how the market establishes an equilibrium level for a swap spread. We will examine the theoretical basis for our analysis of swap spreads in the US, followed by a discussion of the actual market flows and other technical forces that support, or possibly hinder, the theory. In addition, we will touch upon establishing a swap spread view.

Breaking down a swap spread

First and foremost, we believe that a swap spread can be decomposed into the following components:

Fundamental factors

- Carry/funding effect
- Systemic risk factor

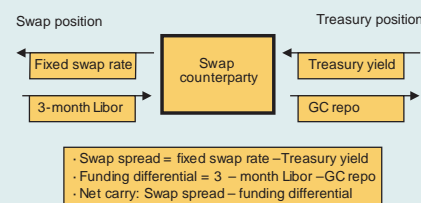
Technical factors

- Treasury-specific factors
- Supply/demand effect.

Fundamental factors:

- Carry/funding effect: A portion of the swap spread is attributable to the carry differential between a long/short position in a government bond and an offsetting pay/receive fixed position in the swap market. A generic Treasury bond is typically funded at the general collateral (GC) repo rate, and the fixed-leg of a swap is funded at three-month dollar Libor. For example, if we were 100% confident that the differential between the GC repo rate and three-month dollar Libor would always be 25 basis points, the swap spread for a generic Treasury bond (meaning the bond always funds at GC) would most certainly converge to 25 bp.

The funding effect on a swap spread



Due to the historically stable nature of the relationship between general collateral repo and three-month dollar Libor in the US, the carry component of swap spreads in the US has been – and we expect will remain – at the 15–25 bp level (see figure 1).

- Systemic risk factor: In the days after the tragic events of September 11, investors demonstrated a strong preference to own government bonds rather than owning credit products or receiving fixed on a swap. The subsequent widening of swap spreads is a clear example of an increase in the systemic risk component of swap spreads.

The systemic risk component of a swap spread differs significantly from the risk premium in a corporate bond spread. Unlike a corporate bond, a swap transaction does not incur the idiosyncratic risks associated with a particular corporate bond, such as the loss of interest payments and principal due to default or the risk of rating downgrades. In addition, if a bank that is included in the set of reference banks for establishing the daily Libor settings is downgraded, the bank will likely be removed from the reference panel and replaced by a more creditworthy institution. It becomes a different story if a banking crisis occurs and all financial institutions suffer, since there would be no creditworthy institutions left to replace the ailing ones. As a result, the funding costs of

Figure 1. US Treasury securities outstanding

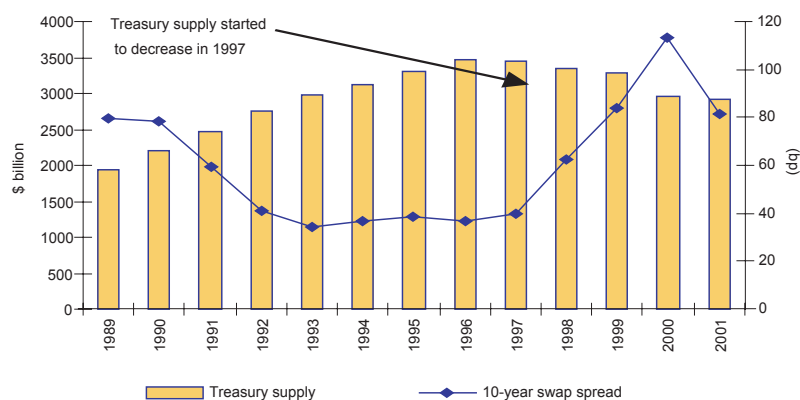


Figure 2. Ten-year swap spread [more info?]



most financial institutions would increase, and Libor would subsequently set higher.

We must now crystallise the definition of the systemic risk component of a swap spread. First, as can be inferred from the concluding point in the previous paragraph, swap spreads serve as a gauge of systemic market risk rather than company-specific risk. For example, the bankruptcy of a single corporation that affects the individual investors involved but not the financial markets as a whole, will not have a significant, if any, impact on the market level of swap spreads. The bankruptcy of Enron, one of the largest such events in the US, had little, if any, impact on the level of swap spreads. However, the 1998 Russian crisis, coupled with the lack of confidence surrounding Long-Term Capital Management's near failure, had an impact on many market participants, thus putting all financial markets at risk. As a result, the systemic risk served as the catalyst that dramatically drove swap spreads wider. In fact, this one event has probably increased the market's expectation of the equilibrium level of the systemic risk component of swap spreads, thus preventing swap spreads from returning to the tight levels that existed prior to this crisis (mid- to late-1998).

In addition to describing the risk premium in a swap spread as the measure of systemic market risk, in a similar vein, we would also describe the risk premium as a measure of the level of liquidity in the financial markets. When the level of financial liquidity is high, as is typical in a Fed-easing environment, the level of systemic risk premium embedded in a swap spread should fall. Due to the fact that the level of rates and curve shape are both a residual of Fed activity, there tends to be a correlation between swap spreads and these market factors. Therefore, some may point to curve

shape and the level of rates as drivers of swap spreads, but the real force at work is a shift in the market's perceived level of systemic risk premium curve.

This component of swap spreads is expected to have an upward sloping term structure, meaning the systemic risk premium is expected to be higher further out the swap spread. For example, the swap spread on a three-month Treasury is primarily determined by the funding effect, while the swap spread on a 10-year Treasury is much more dependent on the market's gauge of systemic market risk.

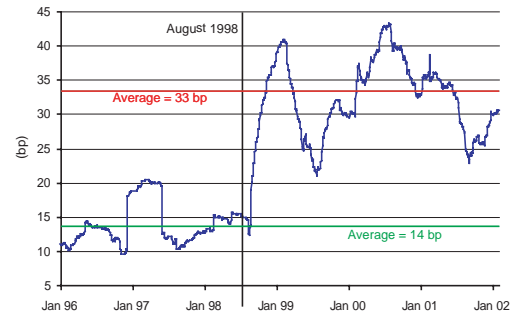
Technical factors

□ Treasury-specific factors: The final component of US swap spreads, which we certainly cannot ignore, is the effect of Treasury-specific factors. The two primary Treasury-specific factors that we focus upon are repo effects and supply.

Repo specialness refers to a security that trades richer than the general collateral rate in the repo market. Typically, repo specialness is most often associated with benchmark securities, thus causing the benchmark issues to trade richer than surrounding off-the-run securities. For example, the swap spread on the benchmark five-year note in the US, trades approximately 4–8 bp richer than surrounding issues on the curve and this issue (the UST 11/06) has been trading with a repo rate of close to 0% in the repo market during most of January and early February.

Over the past six to 12 months, there has been an increasing tendency for Treasury securities other than the benchmarks to trade special in the repo market. This development may be attributable to the decline in outstanding Treasury supply over the past three years. This, in turn, has forced market participants to focus more keenly upon the impact of the repo market on the level of swap

Figure 3. Normalised actual 10-year swap spread volatility



spreads, with the general increase in the risk of repo specialness putting widening pressure on swap spreads.

The supply factor has been driven by developments on the budget front over recent years. With budget surpluses of the late 1990s coming to a head in 2000, Treasuries obtained a scarcity premium that contributed to the extreme widening of swap spreads during this period. (Keep in mind that the risk component of swap spreads was also increasing in late 1999 and 2000 as the Fed hiked rates to a maximum of 6.5%.) Recent events have turned the budget surplus into a deficit, thus deflating the scarcity value given to Treasuries. The supply factor has contributed to the increased volatility in swap spreads relative to the past as this issue is **very [often?]** subject to political debates on tax and spending. The effect on the market tends to be rather psychological in nature.

The supply factor may affect the shape of the swap-spread curve, as supply changes are not always uniform across different sectors. Over the past three years, the sector of the curve that has been affected most by the decrease in Treasury supply has been the one- to five-year sector, thus causing swap spreads in this sector of the curve to trade rich. Largely, as a result of the move from monthly to quarterly issuance of five-year notes in June 1998, coupon bonds in the one- to five-year sector of the curve have decreased from 38% of the Treasury market to approximately 27% (see table 1 overleaf). Over the course of the past 12 years, we have never experienced such a dramatic composition shift in any sector of the coupon curve. Going forward, however, this trend may be reversed as the recent move to deficits is leading to increases in Treasury supply in the two-year, five-year and 10-year sectors, but not the very long end of the curve, as long bond issuance in the US has been suspended.

Figure 4. Three-month changes in swap and Treasury rates (2000–present)

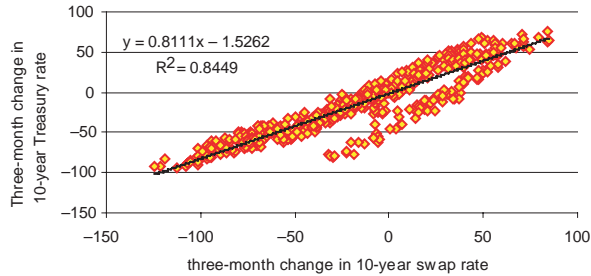
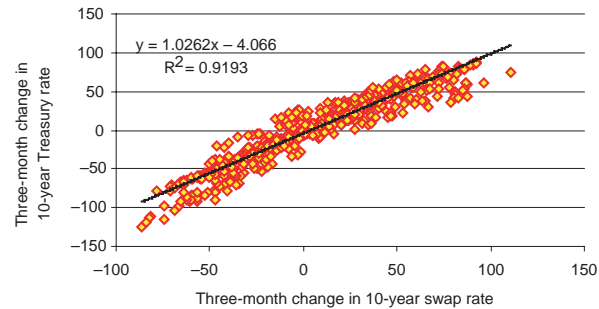


Figure 5. Three-month changes in swap and treasury rates (1997 and 1999)



A changed market

□ Supply/demand effect: Perhaps the single event that had the most profound effect on today's swap market was the crisis of 1998. In fact, today's swap market is subject to significantly different dynamics compared with the swap market that existed before the crisis. This huge market event brought the attention of numerous investors to the swap market, a market that many investors had ignored in the past.

A Treasury yield does not incorporate the systemic component that exists in a swap spread. In fact, this yield is defined as the risk-free rate. Traditionally, it was the risk-free nature that drove the Treasury curve to become the benchmark of choice. During 1998's credit event, a severe flight-to-quality bid occurred in the Treasury market, resulting in an enormous outperformance of the Treasury curve and a steep increase in risk premiums. As the Treasury market decoupled from other asset classes, market participants who hedged their portfolios with Treasury securities found themselves being adversely affected. The swap market, on the other hand, because of its embedded systemic risk component, performed in line with the credit markets, as exemplified in the high correlations among the various asset classes.

Many of the recent developments in the fixed-income markets have focused upon the emergence of new benchmarks for pricing other securities and alternative vehicles for hedging selected risk exposures. In the past decade, government securities were widely recognised as the sole benchmark and hedging instrument in the financial markets. Recent market disturbances have raised awareness among the investment community of the need to take both market risk and credit risk into account when constructing an efficient hedge. Many market

Table 1. % composition of the Treasury market (at fiscal year-end)

	Bills	< 1-year	1- to 5-year	5- to 10-year	> 10-year	TIPS
1998	15.4	17.4	38.1	10.4	16.6	2.1
2001	23.2	15.4	27.2	12.4	16.6	5.2
Change	7.8	-2.1	-10.9	2.1	-0.1	3.2

Source: Morgan Stanley calculations based on Treasury Bulletin data

participants, such as asset managers, insurance companies, banks, corporations, central banks and broker/dealers have reconsidered their benchmark curve of choice for the fixed-income market. Having a systemic risk component, the swap curve has attracted interest as the reference curve for the fixed-income market. In turn, other attractive qualities of the swap market were brought to light, such as its smooth curve shape, flexibility and constant financing rate, ie, three-month Libor. These qualities and more have been attracting increasing numbers of new market participants to the swap market over the past several years.

We believe the concept of a constant financing rate is crucial to the success and popularity of the swap market. Users of the swap curve need not be concerned with bond-specific financing issues, such as repo specialness or even the inability to fund a less liquid corporate bond in the repo market. This reliability of the assumed funding of a swap makes the swap market an efficient risk management tool for asset/liability management.

The general level of swap spreads was also visibly changed by the crisis of 1998. Since August 1998, the 10-year swap spread has averaged 90bp. In contrast, during the three-and-a-half-year period leading up to August 1998, the 10-year swap spread averaged 40bp. We can point to two factors that may have caused this rise in the general level of swap spreads. First, it appeared that as more

investors started using swaps to hedge their portfolios, the interest to pay fixed in the swaps market pushed swap spreads out. Second, it is likely that investors re-evaluated their risk appetites with the crisis still fresh in their memories. To put the widening in context with the theory, the systemic risk premium component of swap spreads increased, thus pushing out spreads. The actual market flows that contributed to the spread widening in 1999 and 2000 was the general shift from Treasury hedges to more conservative swap hedges.

The most dramatic change in the swap market since **the fall of [decline or autumn?]** 1998 has been the increase in volatility of swap spreads. Since August 1998, the average actual volatility of the 10-year swap spread has increased by approximately 135% (see figures 2 and 3 on previous page).

More recently, the most significant change in the market is the increasing use of the swap market by asset managers. The focus is no longer on shifting Treasury hedges to swap hedges, but is now on trading the basis between the swap market and other asset classes, such as the agency market and the mortgage market. Therefore, the flows in the market have become better balanced and the correlations between swap rates and mortgage, agency, CMBS and ABS yields have been very high.

New issuance hedging

A significant market flow that affects the level

of swap spreads is new issuance hedging. Many issuers have tended to swap their new fixed-rate liabilities to floating by receiving fixed in the swap market, thus applying tightening pressure on swap spreads. While this is a relatively old dynamic, its effects were well pronounced during the second half of last year, with the high amount of new issuance and a very steep yield curve.

The longer-term effect of new issuance hedging over the next year may be for wider swap spreads. Our corporate strategy team expects that corporate supply will decrease by approximately 20–30% in 2002, as many companies have already **termed out [ok?]** their short-term bank debt and commercial paper over the course of 2001. In addition, companies are expected to show continued restraint on capital expenditures, mergers and acquisitions, and share repurchase activity fronts.

While a decrease in corporate supply may help pull corporate spreads tighter, it may be more apt to have a widening effect on swap spreads. Although clearly not the most dominant driver, a decline in corporate supply from the large levels of issuance we have had this past year should be noted. The effects of new issuance hedging on the swap market does not fall in line with any of the three components of swap spreads that we discussed earlier.

Mortgage convexity hedging and the market directionality of swap spreads

The use of swaps as a duration management tool by mortgage investors is becoming an increasingly important driver of swap spreads. These investors have progressively used the swap market to 'delta-hedge' the convexity of

their portfolios by receiving fixed on a swap as yields fall and paying fixed on a swap as yields rise. This market dynamic applies tightening pressure on swap spreads during market strength and widening pressure on spreads during market weakness. The market-directionality of swap spreads is not a new phenomenon. As we have established, swap spreads are largely dependent on the degree of Fed-driven market liquidity, with interest rate cuts leading to tighter swap spreads and interest rate hikes leading to wider swap spreads.

However, the recent increase in mortgage convexity hedging has significantly exaggerated this market-directionality, and has increased the volatility of swap spreads. One way in which this increase in volatility can be seen is via a historical comparison of changes in swap rates and Treasury yields. From 1997 to 1999, 10-year Treasury yields were approximately as volatile as 10-year swap rates. However, from 2000 to today, 10-year Treasury yields have been only 80% as volatile as 10-year swap rates (see figures 4 and 5 on previous page). The implied volatility markets are also expecting the directionality to persist going forward. Implied volatility on 10-year swap rates has consistently traded higher than implied volatility on 10-year Treasury yields over the past year. Therefore, the volatility market expects swap rates to increase relative to Treasury yields in a market sell-off and decrease relative to Treasury yields in a market rally (see figure 6).

We agree with the volatility market and expect the directionality of spreads to persist. Mortgage convexity hedging is here to stay. We believe, if mortgages increasingly make their way into the hands of mortgage investors

who opt to hedge their changing duration exposure over time, the flows that lead to the market directionality of swap spreads will become more pronounced. Currently, we estimate that the expected amount of mortgage convexity hedging in 10-year swap equivalents, per 10bp move in the 10-year swap rate, is \$9–\$10 billion.

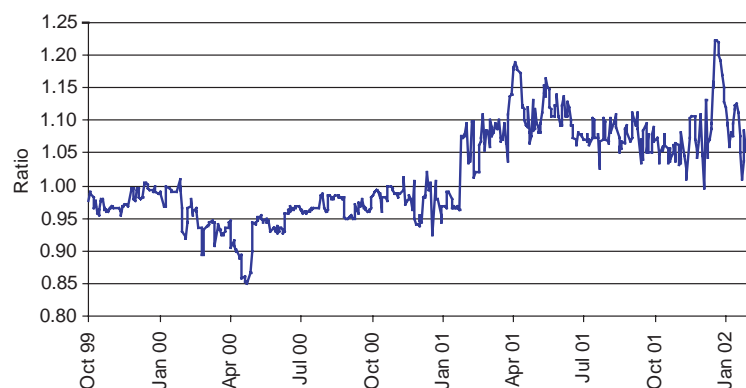
Establishing a swap spread view

Now that we have the components of a swap spread in place, as well as the primary technical forces affecting the market, we have developed a simple but sound structure to establish a forward-looking view of swap spreads.

In terms of the carry/funding component of swap spreads, we have no reason to believe that the historical 20–25bp differential between GC repo and three-month repo will change. As should be clear from the points made earlier in this commentary, the systemic risk component of swap spreads will be largely dependent upon the next phase of the US economy and the resultant response of the Fed. An economic recovery that leads the Fed to reverse its easing campaign will probably cause the risk component of swap spreads to move higher. However, persistent economic weakness in the US or, even more dramatic, the occurrence of a double dip, could bring even further Fed rate cuts and keep the systemic risk component of swap spreads low.

The Treasury-specific component of swap spreads is pointing more to tightening at this point rather than widening. Deficits are now the reality, though severe deficits are dependent upon the passage of President Bush's spending/tax proposal. Without passage of this proposal, Treasury supply will not have to be increased dramatically. ■

Figure 6. Six-month and 10-year swaption normal volume/ six-month times 10-year normal volume



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