



# Changes in the level of basis swaps

Cameron Kinloch of Morgan Stanley looks at the factors which drive the basis swaps market and discovers a valuable risk management tool.

Cross-currency basis swaps convert a floating rate in one currency to a floating rate in another currency. The presence of sustained differences in basis swap levels across countries indicates that there must be fundamental factors which drive the basis swap market. In addition, issuers utilising cross-currency swaps for arbitrage funding or asset and liability management in recent months have created wide swings in cross-currency basis swap levels.

This article first outlines the theory behind the pricing of basis swaps as well as the fundamental factors which drive non-zero basis swap levels. The second half explores how the technical factors of supply and demand can become the dominant influence when large scale funding takes place.

## **Short term basis is arbitrage driven**

The principal of covered interest rate parity determines the pricing of short maturity basis swaps. Every six months, a UK issuer in dollars would have to borrow at six-month dollar Libor, convert the amount to sterling at spot FX, invest the notional at sterling Libor, and enter into a forward FX agreement to convert the notional back to dollars at the end of six months. The difference between the amount of interest earned, or sterling Libor converted to dollars, and the amount of interest owed, dollar Libor, is the 'basis'.

Theoretically, the basis should be zero. In a floating leg of a swap, the cash flows are both set and discounted by Libor, resulting in a present value of par. A swap which is composed of two floating rate legs, even in differing currencies, will net out to zero. The actual

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presence of a non-zero basis suggests that Libor, due to fundamental and technical factors, does not accurately reflect the true discount rate.

## **Fundamental factors drive the long-term basis**

For long-dated swaps, it becomes too costly to roll six-month forwards. Therefore, longer-dated basis swap

levels are driven primarily by other fundamental and technical factors. Among the fundamental reasons for a non-zero basis is how Libor is calculated in each currency. Libor in all currencies is set each day at 11am London time by the British Bankers Association (BBA) using a panel of 16 banks, which includes the most liquid and internationally known banks operating in the country. The Libor rate is calculated by eliminating the highest and lowest four quotes and taking an average of the remaining eight. Although Libor varies throughout the day to reflect different lending rates between banks, the BBA rate set at 11am is used as a readily observable rate.

Euribor, the European benchmark bank lending rate, differs from the BBA's Euro Libor. Euribor is determined from a panel of 57 banks with the highest volume of business in the eurozone money markets. Although some of these banks are less creditworthy than those selected for BBA's euro Libor, Euribor trades very closely to euro Libor.

Since each rate is set by a different panel, some possibilities naturally arise for different levels of basis swaps:

**Differences in credit quality** – The Libor set each day is entirely dependent on the banks which compose the panel. However, the panel is not a pure measure of the lending rates between banks of a specified credit rating. Rather, it is a measure of the most creditworthy banks, which can differ by country and over time. Creditworthiness can be proxied in the market by how the sector trades as a spread to the risk-free rate, with larger spreads reflecting greater credit risk. For example, dollar Libor spreads over the Fed funds rate during



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FIGURE 1

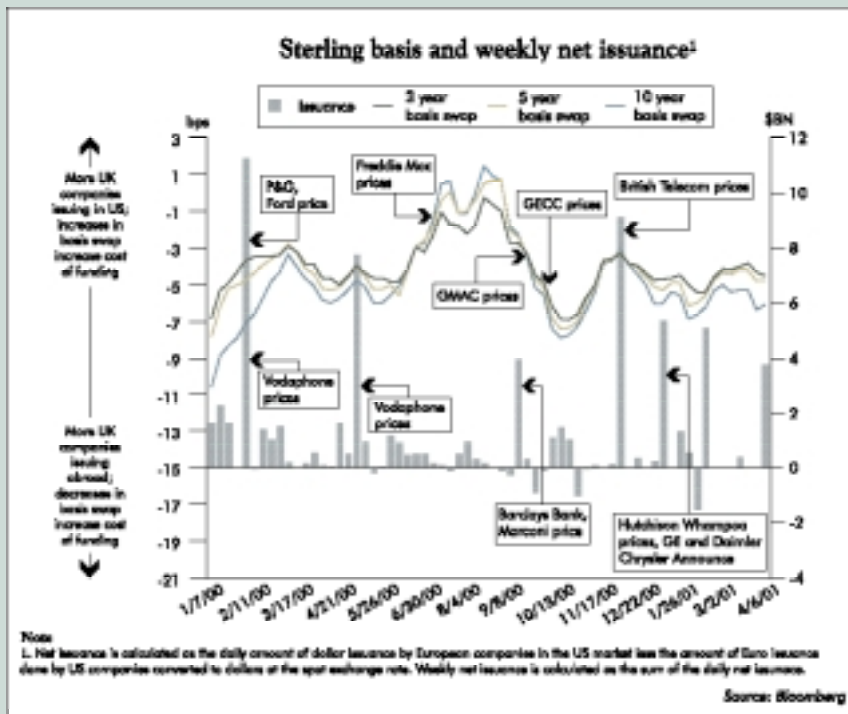
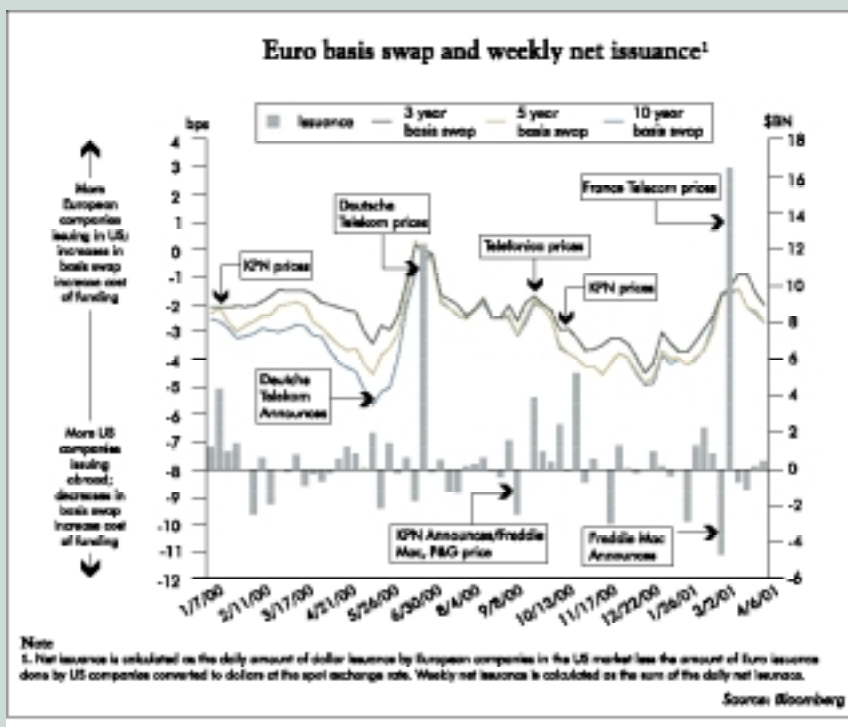


FIGURE 2



the past two years most closely mirrored that of 'A'-rated companies but recently became more closely related to 'AAA' credits, suggesting that Libor reflected a much stronger relative credit quality.

Selecting the most international and liquid banks in each country cannot be decoupled from the country's econom-

ics. To the extent that borrowing costs are a pure reflection of a country's economic prospects, Libor reflects the strength of the banking sector, prospects for economic growth, expectations of monetary policy, and capital inflows and outflows due to these policy changes. Over the past two years, narrower basis swap levels have been a

reflection of the settling of world markets since the crisis in 1998.

**Differences in Libor panels** – In addition, the composition of each panel gives rise to fundamental differences. The 1999 controversy in Japan highlights this issue. Over the past few years, Japanese banks have been subject to higher borrowing costs due to their deteriorating creditworthiness, termed the 'Japanese premium'. The Yen Libor panel of banks included eight Japanese banks. Due to the Japanese premium, these banks were supplying considerably higher quotes than their eight non-Japanese counterparts. In January 1999, charges that Yen Libor was artificially high resulted in the ejection of 2 'BBB'-rated Japanese banks from the panel and the acceptance of an 'A'-rated Japanese bank and a European bank to fill the vacancies. This change resulted in a 15% fall, the largest daily fall in the Yen Libor rate in several months. From this example, we can see that large changes in Libor can reflect fundamental differences in borrowing costs. The BBA says it plans to review the composition of all currency panels at least once a year.

**Expectations** – Investors price into the basis their expectations of the health of the banking sector. To this extent, an upward sloping basis curve reflects investors' concerns about credit quality. This can be observed in the Yen market, where the longer maturity basis swaps trade as a spread to shorter maturity swaps. Investors may also price in fears that the banks themselves lack the ability to measure credit quality accurately and reflect it accurately in their lending rates. These concerns may also result in a term structure of basis swap levels. Libor is also not a pure representation of credit, which may lead to expectational errors. Countries undergo shocks to their economies, such as oil price shocks or unexpected changes in monetary policy, affecting the banking sector. However, the impact of such shocks is difficult to ascertain immediately. In addition, the Libor panel is not modified to immediately reflect changes in credit quality due to such shocks. In other words, there is a learning period that takes place before the most credit-worthy and liquid banks are incorporated into the Libor panel. These lagged responses will affect the calculation of Libor, giving rise to non-zero basis swap levels.

FIGURE 3

Pension fund swaps

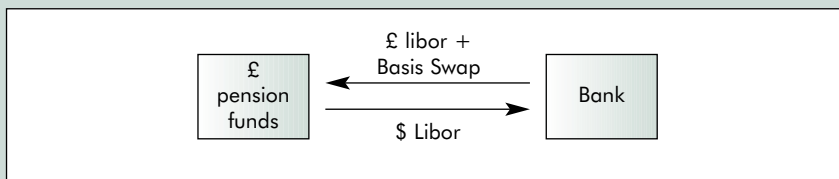
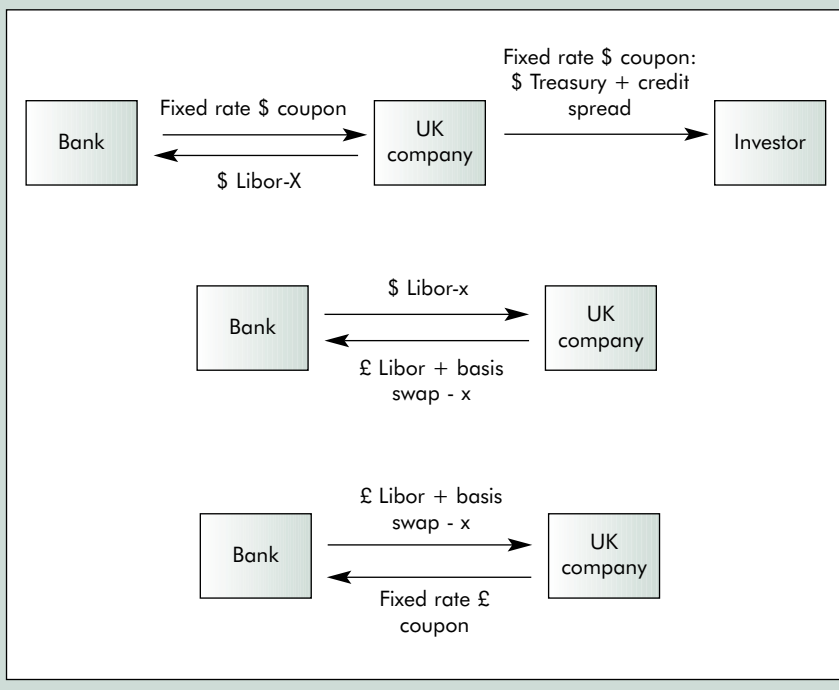


FIGURE 4

Three legs of a cross-currency swap



September 2000 could have had a much larger impact on the basis swap market had there not been telecom issuance being swapped the other way. Even so, the announcement of these large deals had an immediate effect on trading levels, moving up to a basis point in the 24 hours after announcement. At the time, it was thought that the market could move even more significantly, potentially raising the euro funding levels up to 30% higher than the US corporates' dollar funding levels.

**Sterling/dollar basis swap market**

The three to 30 year sterling/dollar basis swaps have recently traded in a range of -10 to +2bps. The market is driven by the demand for non-sterling assets from UK pension funds. Pension funds synthetically create sterling-denominated assets by buying foreign-denominated bonds and asset swapping them to sterling, pushing the basis swap more negative (see Figure 3). The sterling/dollar basis swap level is also affected by the level of swap spreads. This can be seen when separating a fixed-to-fixed cross currency swap into three swaps. If a UK company issues in dollars at the dollar Treasury rate plus its US credit spread, this will swap out to dollar Libor minus some amount if swap spreads are wider than the issuer's credit spread. The basis will partially compensate for this difference by tightening, or becoming less negative (see Figure 4).

**Opportunities**

The globalisation of business activity is driving more companies to use basis swaps. The dramatic growth in non-dollar credit markets is also encouraging greater cross-currency activity. This increasing demand will potentially create more volatility in the short term but will increase the depth and liquidity of the markets in the long run. While issuers should weigh the benefits of hedging their cross-currency exposure against the costs of doing so, they should be aware of the opportunities these markets present for corporate risk management. ■

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**Market flows dominate during funding activity**

Large short-term movements in basis swap levels are primarily driven by flow-related activity. As these factors drive the costs of arbitrage funding, understanding the factors that drive them are essential:

- supply/demand – for the most part, short-term movements in basis swap levels are a reflection of the demand to be exposed to a particular currency versus the ability of the market to satisfy that demand. Large flows into euros at the beginning of 1999 reversed with the weakening of the euro and the attractiveness of the dollar; and
- liquidity premium – since basis swap costs are driven by demand and supply, one-way traffic can create liquidity premiums. Most euro/dollar

basis swap traders are imposing a liquidity premium to receive dollar Libor and pay euro Libor due to the high market demand for the opposite trade. This liquidity premium makes issuing dollar bonds and swapping back to euros less expensive for most European borrowers.

**Euro/dollar basis swap market**

The euro basis swap market has recently traded in a range of roughly -5 to -1 in the three to 30 year maturities. For instance, at its most unattractive level a euro fixed rate issuer would receive euribor -5 versus paying dollar Libor flat. Compared with the  $\$/$ dollar interest rate markets, the  $\$/$ dollar basis swap market has less depth and can be highly volatile, driven in part by large issuers swapping into dollars or vice versa. For example, the large Euro issuance by US companies in