

MAC Swap Futures

HIGHLY CORRELATED WITH OTC SWAP RATES

Executive Summary

CME Group's MAC Swap Futures (formerly Deliverable Swap Futures or DSFs) provide interest rate swap exposure with the added capital efficiencies and operational benefits of standardized futures contracts. At expiration, all open positions physically deliver into CME Group Cleared Interest Rate Swaps.

This study evaluates the correlative relationship between MAC Swap Futures prices and the corresponding par spot-starting interest rate swap ("IRS") rates.

Methodology

For each MAC Swap Future contract, the fixed rate for the deliverable IRS is established when the futures contract is listed for trading, at a rate close to the forward rate for an IRS with the corresponding maturity, at an integer multiple of 25 basis points per annum. Since the futures contract fixed rate does not change during the 6 months until contract expiration, the MAC Swap Future is traded in price terms, based on the net present value ("NPV") of the underlying IRS.

Since IRS are traded at par on a yield basis, it is necessary to convert the price of the MAC Swap Future into an equivalent swap rate. To do this, a three-step process is followed:

- 1. Calculate NPV:** The futures contract NPV is obtained by subtracting 100 from the MAC Swap Future price. (A price of 100 points represents an NPV of 0, i.e., a par swap.)

$$NPV = (MAC\ Swap\ Futures\ Price - 100) * \$1,000$$

- 2. Calculate PV01s:** IRS PV01s are derived from the daily discount factor file published by CME Clearing in connection with its Cleared OTC IRS end-of-day settlement process.

$$PV01 = \frac{\$1,000}{100} * \left(\frac{180}{360} \right) \sum_{t=1}^T df_t$$

Where df_t is the discount factor for the fixed rate coupon of payment date t for the forward starting underlying contract-grade IRS, where $t = 1$ is the payment date of the first fixed rate coupon, and T is the maturity date.

- 3. Find the MAC Swap Future's implied IRS rate:** The MAC Swap Future implied yield rate is calculated as follows:

$$Implied\ Rate\ (bps)^1 = \frac{(MAC\ Swap\ Futures\ Contract\ Fixed\ Rate\ (bps) - (NPV/PV01))}{1}$$

Having implied an IRS rate from the MAC Swap Future price, one can readily compare the dynamics of this rate with those of the corresponding par spot-starting IRS rate.

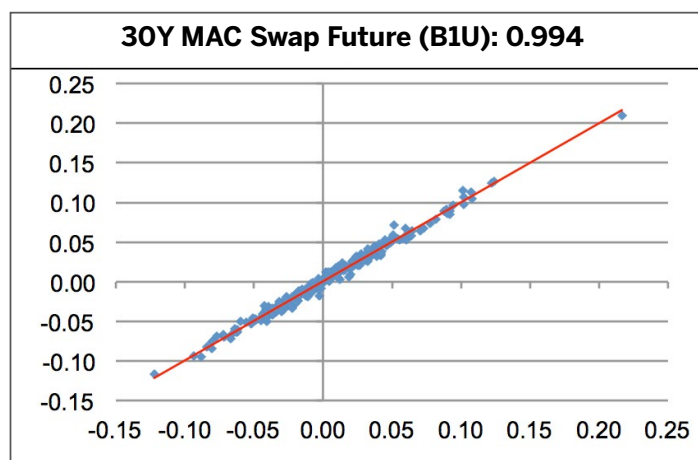
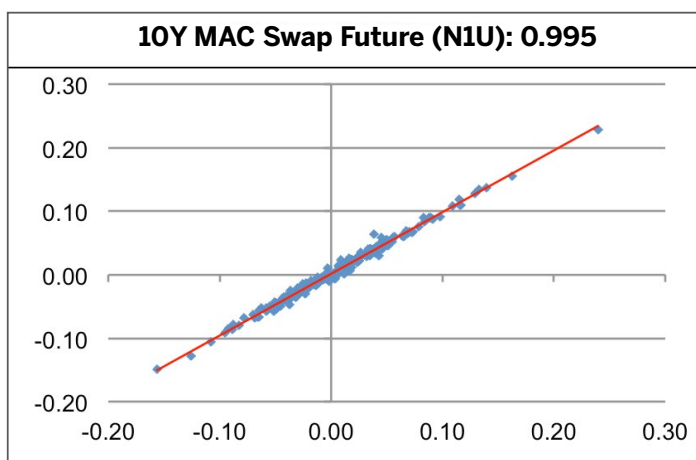
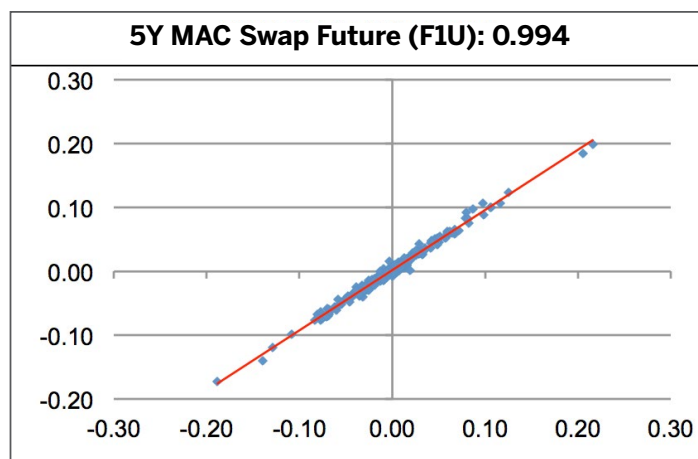
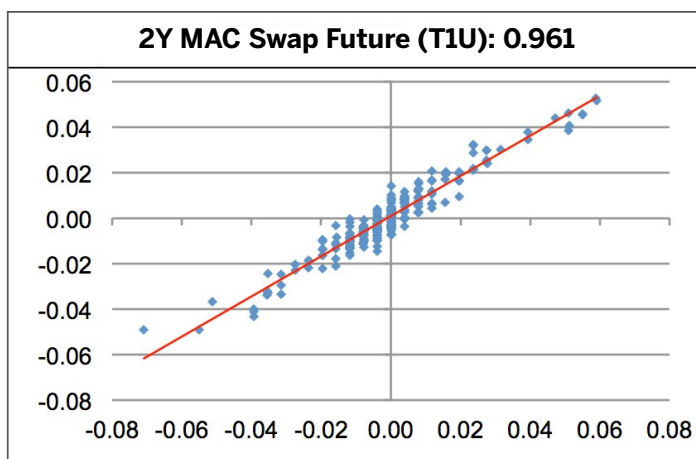
The data for this study includes daily prices and rates throughout 2013. MAC Swap Future prices are represented by 3 p.m. EST daily futures settlement prices, as determined and published by the Exchange. Par spot-starting IRS rates are as determined by CME Clearing at 3 p.m. EST each day, in the course of its daily Cleared OTC IRS settlement process. All data can be found at cmegroup.com/correlation.

Results

The following table and scatter diagrams indicate the strong correlative relationships between daily changes in IRS rates implied by MAC Swap Future daily settlement prices and daily changes in par spot-starting IRS rates as reflected in CME Cleared OTC IRS daily settlements:

| Tenor | MAC Swap Future rate correlation with par swap rate |
|-------|---|
| 2y | 0.961 |
| 5y | 0.994 |
| 10y | 0.995 |
| 30y | 0.994 |

¹ Calculation of the implied IRS rate in this study assumes a linear relationship between the MAC Swap Future notional price and the spot starting IRS rate. Note: Data and examples as of January 31, 2014.



Conclusion

This study demonstrates high correlation between the dynamics of IRS rates implied in MAC Swap futures prices and the dynamics of rates on corresponding par spot-starting IRS. These findings suggest that MAC Swap Futures users may reasonably consider using these products as a means to hedge or to synthesize spot-starting plain-vanilla IRS exposures.

Additional Resources

- Analytics – cmegroup.com/macswapanalytics
- Spread Calculator – cmegroup.com/spreadcalculator
- Resource Page – cmegroup.com/macswapfuture

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