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CLO

- **Six US CLOs and one EUR CLO priced this week for $4.2bn. US CLO supply in May MTD is already $5.31bn on 9 deals following the post-crisis record of $13.42bn last month**
- **In a joint special report with J.P. Morgan Interest Rates Derivatives Strategy, we explain cross-currency FX basis swaps and discuss potential CLO uses on both assets and liabilities**
- **A CLO usually has a 'home bias'. European CLOs may have flexibility for non-Western Europe assets and US CLOs may have up to a 20% non-US limit, with grouping and sovereign rating restrictions. Each CLO is different, and not all can use asset hedges**
- **Given asset sourcing challenges, recent softness in USD loans, and a narrower (less negative) EUR/USD basis we discuss EUR CLO buying of USD loans. The EUR/USD FX basis is back to its pre-crisis lows (close to zero). The basis is likely capped at current levels with a marginal wider bias (more negative) reflecting the differing outlooks for the ECB versus the Fed**
- **With a globalizing CLO investor base, we discuss hedging USD CLOs in markets with especially low yields, as in Japan (BoJ's QQE). A negative JPY/USD FX basis reduces trade attractiveness but the inverted basis curve means shorter-maturity swaps can be rolled for cheaper hedges**
- **In general however, roll risk may be less suitable for buy-and-hold investors in CLO tranches, and given call risk (etc) investors should consider Perfect Asset Swaps as a way to hedge these risks**
- **We touch on Perfect Asset Swap mechanics as well as other CLO-related FX topics**

Relative value & primary flows

Six US CLOs and one EUR CLO priced this week for $4.2bn. US CLO supply in May MTD is already $5.31bn on 9 deals following the post-crisis record of $13.42bn last month. YTD issuance is $48.0bn on 93 CLOs (77 US for $40.4bn, 7 US refi's for $2.2bn, and 9 EUR for $5.4bn (€3.95bn)).

Exhibit 1: Global CLO spreads & recommendations

Sector	Current WAL (yrs)	Current Spread	Change vs 05/02	Change YTD	Change in 2013	Recommendation
US CLO						
Seasoned						
Super Senior	0.5-1.5	75	0	0	-35	Overweight
AAA	0.5-1.5	85	0	5	-35	Overweight
AA	1-2	145	0	20	-60	Overweight
A	2-3	190	0	15	-140	Overweight
BBB	2-4	255	-10	20	-165	Neutral
BB	2-4	475	0	0	-75	Neutral
Benchmark						
Super Senior	1.5-2.5	105	0	-10	-5	Overweight
AAA	1.5-2.5	110	-5	-10	-10	Overweight
AA	2-4	170	0	-5	-25	Overweight
A	3-5	235	0	-20	-45	Overweight
BBB	4-6	340	0	-20	-90	Neutral
BB	4-6	530	-10	-45	-100	Neutral
New Issues*						
AAA	5-6	148-158	-1	3	11	Overweight
AA	6-8	205-235	0	-5	0	Overweight
A	6-9	310-330	0	15	-20	Overweight
BBB	7-9	410-435	0	10	-113	Neutral
BB	7-9	610-640	0	13	-113	Neutral
B	7-9	715-750	0	20		Neutral
Euro CLO						
AAA	1-2	115	0	-10	-40	Overweight
AA	2-4	185	0	5	-135	Overweight
A	2-5	290	10	30	-265	Overweight
BBB	3-5	400	0	-40	-410	Neutral
BB	5-7	575	0	-35	-740	Neutral

Source: Spread to Libor or Euribor (bp) for originally-rated categories
Source: J.P. Morgan. *New issue spreads represent a range of spreads to indicate manager tiering. Note: 1: AAA is weighted average pass-through spreads. 2: Our series represents 'mid-quality' pricing in secondary trading. 3: Current WAL. 4: Between November 21, 2008 and December 9, 2010, AA to BB spreads are estimated using simplified duration and other assumptions; thereafter, indicative spread levels are used.

New-issue mezzanine spreads reflected the broader weakness in HY loan spreads throughout April, with BBB, BB, and single-Bs widening 10bp, 17.5bp, and 20bp since the beginning of April. However, this week marked a reversal in loan retail fund flows with Lipper reporting a +$69mn inflow and the average loan price in our JPM LL Index rising $0.08.

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The FX cross-currency basis & CLOs: A Special Report

Introduction

In a joint special report with J.P. Morgan Interest Rates Derivatives Strategy we explain cross-currency FX basis swaps and discuss CLO uses on both assets and liabilities. FX risk is not new, particularly in European CLOs, but two themes underpin this story.

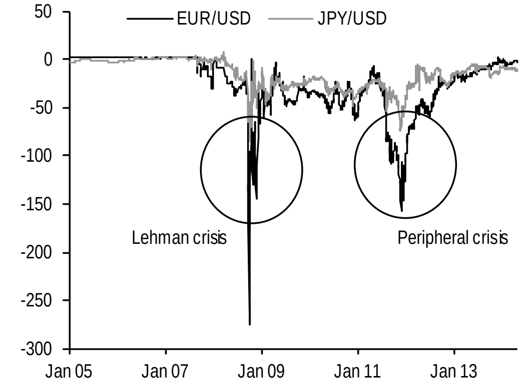
First, given the challenge of asset sourcing faced by European CLOs – and potential opportunities given recent softness in USD loans – we discuss hedging USD or GBP assets given the basis. A CLO usually has a 'home bias'. European CLOs may have flexibility for non-Western Europe assets and US CLOs may have up to a 20% non-US limit, with grouping and sovereign rating restrictions. Each CLO is different, and not all can use asset hedges[1]. Second, with a broadening and increasingly globalized CLO investor base we discuss hedging USD CLO tranches in investor markets where yields in local currencies are especially low, as in Japan. In either case (asset or liability) we touch on Perfect Asset Swaps (PAS) as a hedge and other CLO FX topics.

Cross currency basis – an introduction

A cross currency basis swap is an agreement to exchange floating rates (e.g. Euribor) in a foreign currency against USD Libor. The transaction involves an exchange of foreign currency upfront with floating payments exchanged over time (every three months until the maturity of the swap) and re-exchange of notionals at the end of the term. For instance, in a EUR/USD cross-currency basis swap, the counterparty borrowing USD cash initially pays USD Libor, whereas the other counterparty lending USD and borrowing EUR initially pays Euribor + a spread, also known as the "FX basis". At the end of the contract, principal is exchanged with the same spot FX rate at the beginning of the contract. The FX basis is generally negative, reflecting the scarcity premium of USD[2]. For more details on the workings of the cross-currency basis, see *Cross-currency basis likely to normalize further* (January 28, 2010).

Exhibit 2: The cross-currency bases reflect the scarcity premium of USD and tend to widen (more negative) during periods of crisis

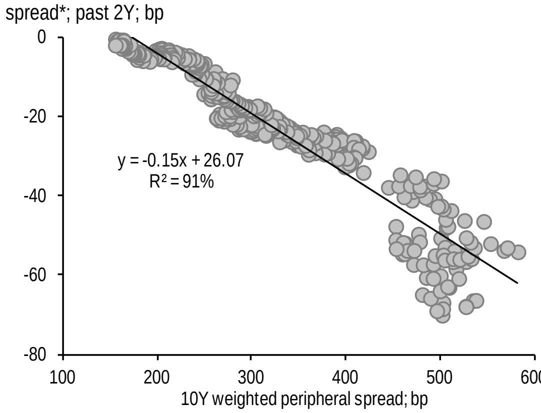
3M EUR/USD and JPY/USD cross-currency basis; since Jan 2005; bp



Source: J.P. Morgan.

Exhibit 3: The EUR/USD cross-currency basis has been driven by the peripheral crisis recently

1Y EUR/USD cross-currency basis regressed against 10Y weighted peripheral spread*; past 2Y; bp



Source: J.P. Morgan.
* 10Y weighted peripheral spread computed against Germany for Ireland, Portugal, Italy and Spain (weighted by the size of their outstanding bond market)

Prior to the credit crisis, the EUR/USD FX basis traded close to zero. However, these bases turned sharply negative during the peaks of the credit crisis and again during the peripheral crisis reflecting the high premium attached to owning USD cash in these periods (Exhibit 2). As the ECB opened its USD swap facility at a fixed spread to the refi rate, the basis declined. Exhibit 3 shows that more recently, the EUR/USD FX basis has been largely driven by sovereign spreads. The long-end of the

[1] CLO rating guidelines require asset/liability FX mismatches to be hedged on a macro or asset-specific basis, e.g. in macro hedging a EUR CLO with some USD assets could issue some matching USD liabilities.
[2] This is because an investor wanting USD cash (the reserve currency) would be willing to exchange its local currency (say EUR) at a discount relative to USD. During crises, foreign banks find it difficult to fund their USD liabilities and hence agree to exchange foreign currency at a discount to borrow USD cash. The magnitude of this discount reflects the scarcity premium of USD and manifests itself as negative FX basis.

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cross-currency curve also tends to be driven by issuance[3]. The narrowing (less negative) basis move has continued on the back of improving funding conditions and lower term premia across various asset classes and European corporates issuing in USD.

<u>Assets:</u> EUR CLO buys USD or GBP leveraged loans and swaps back to EUR

Consider a EUR CLO in which the manager wants some USD assets. All else equal, a swap is attractive at narrow levels of the EUR/USD cross-currency basis. Assuming a 1.35 spot FX rate and a USD loan paying Libor + 410bp at the start, the sequence of cash flows for the CLO is:

1. Exchange €100mn for $135mn at inception
2. Buy USD asset that pays Libor + 410
3. Enter into a cross-currency basis (receive the basis)
    a. Pays USD Libor floating rate
    b. Receives Euribor + FX basis (typically the FX basis is negative)

In this example, the (a) spread difference between USD and EUR assets and the (b) cross currency basis drive economics. If we assume the USD asset yields Libor + 410, the 5Y cross-currency basis is -2bp, and the EUR asset yields Euribor + 400bp, then the net pick-up from this transaction would be[4]:

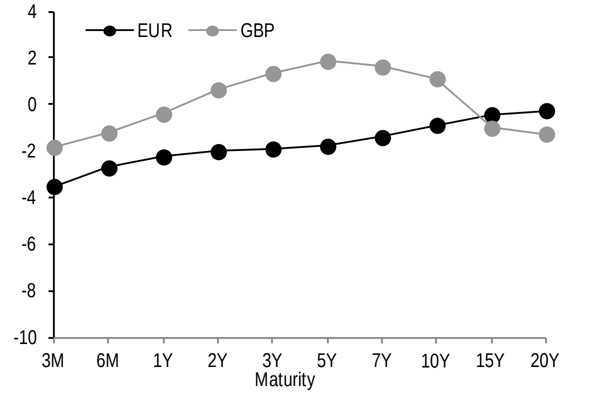
Total pick up = USD spread + FX basis – EUR spread = 410 + (– 2) – 400 = 8bp.

Note, in this simple example using a vanilla swap some of the risks are unhedged (e.g., spread, prepayment, credit, any asset Libor floor) and CLOs typically use PAS rather than vanilla swaps (see Appendix I). In any case, the above shows that, all else equal, a narrow basis (less negative) makes it more attractive for a EUR CLO to own USD loans, with EUR/USD basis back to its pre-crisis lows (close to zero) (Exhibit 2). Our baseline view remains that the basis is likely capped at current levels with a marginal wider bias (more negative). This mainly reflects our view that, on the one hand, the ECB is expected to remain supportive on liquidity and funding conditions but the Fed is likely to continue tapering.

[3] See *Corporate bond issuers in Euro area and UK: A framework from the rates perspective*, by Fabio Bassi, 29 January 2014.
[4] This transaction leaves us with the CLO issuer receiving Euribor floating rates every three months. For simplicity, assume that the liabilities are also every three months. However, to convert into a 6M liability, we just need to add the 3s/6s basis to this transaction.

Exhibit 4: The EUR/USD (GBP/USD) cross-currency basis curve is flat making it marginally attractive for EUR CLOs to hold USD assets, all else equal

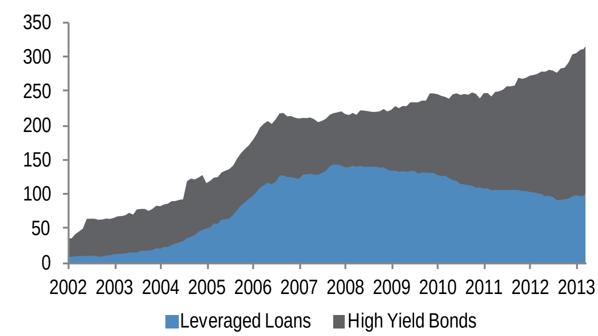
EUR/USD and GBP/USD cross-currency bases across various maturities; bp



Source: J.P. Morgan.

Exhibit 5: European non-financial HY bond & institutional leveraged loan amount outstanding

€bn



Source: J.P. Morgan, MARKIT Group, S&P LCD.

Overall, we do not expect a persistent scarcity of EUR, which would keep pushing the EUR/USD cross-currency basis in positive territory (although 0 is not a cap for the basis). However, our positive view on peripheral spreads (we are biased long 10Y Spanish vs. German bonds) is supportive of a narrower basis. On loan pricing, recent weeks have witnessed fund outflows with USD single-B/BB loans down an average $0.20/$0.38 in our JPM LL Index since the start of April. During that time, the single-B component of the S&P ELLI index is about flat, so there may be cross-market opportunities.

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Exhibit 4 shows the current EUR/USD cross currency basis by maturity. If for simplicity's sake we assume EUR loans yield Euribor + 400bp whereas USD loans yield Libor + 410bp, then the current cross-currency bases are marginally attractive to buy USD loans (current breakeven levels for EUR/USD cross currency basis is -10bp, given our assumption of spreads – a level at which a EUR CLO would be indifferent between holding EUR loans versus USD loans). Again, in addition to the cross-currency basis, economics of such trades would depend on loan spreads and CLO funding cost, with CLO documentation and manager style playing a part.

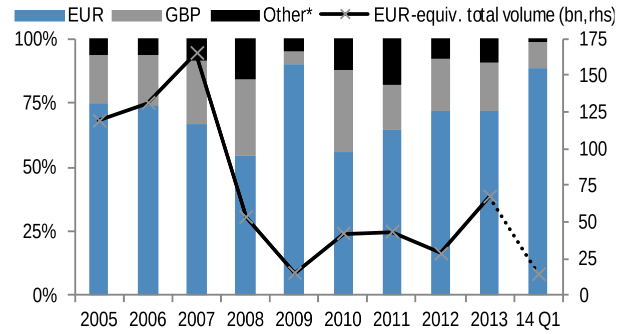
The GBP/USD basis curve is currently similar to the EUR/USD basis curve across all maturities, so the above conclusions also hold for EUR CLOs buying GBP loans. European CLOs rarely issue GBP tranches, but in theory a GBP CLO can have a marginal yield pick-up in yield given the narrow basis. We expect the GBP/USD basis to hover around current levels making loan spread the main driver of owning EUR/USD assets. Ultimately, given stronger issuance in European HY bonds versus loans (Exhibit 5) and non-EUR loan issuance (Exhibit 6), asset sourcing – rather than relative value – may be the main driver of CLO currency trades. Again, given loan prepayment and credit risk CLOs tend to use PAS.

<u>Liabilities:</u> JPY investor buys USD CLO tranches and swaps back to JPY

There may be applications for the CLO investor base to grow in markets with especially low yields. For example, as a part of its QQE program the BoJ is taking down all net JGB supply and has reduced the stock of JGBs available to private investors. As JGBs constitute a very high % of Japanese bond total net issuance (JGBs were 95% and 90% of total net issuance of Japanese bonds in 2013 and 2012, respectively), JPY investors continue their search for higher yielding foreign assets[5].

We highlight that a negative JPY/USD cross-currency basis reduces the attractiveness of such a transaction as the investor receives the negative basis. However, as the JPY/USD cross-currency basis curve is currently inverted (Exhibit 7), investors can in theory take advantage of this by entering into shorter-maturity swaps and rolling these into newer swaps upon maturity. We have a neutral view on the JPY/USD cross-currency basis and favor rolling short-term FX hedges over long-term hedges. On the other hand, while this strategy may be cheaper at the outset, it entails roll risk which is less suitable for typical buy-and-hold investors in CLO tranches with long average lives. In addition, investors hedging tranches should consider PAS as a better way to access investments given call probability/other CLO risks.

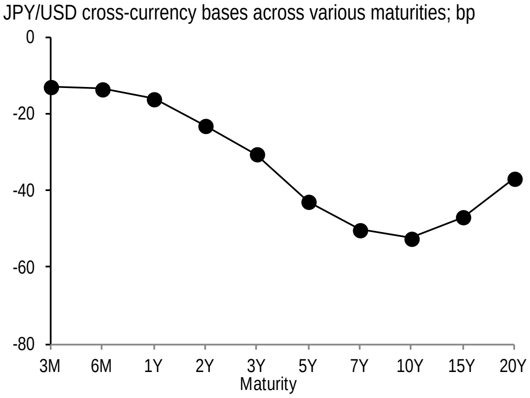
Exhibit 6: European leveraged loan issuance volume



Source: S&P LCD. * USD, CHF, Scandi (NOK, SEK, DKK), PLN, and others.

Exhibit 7: The JPY/USD cross-currency basis curve is inverted; rolling short-term FX hedges for Japanese investors buying USD CLOs can be more attractive – at the outset – than long-term FX hedges

JPY/USD cross-currency bases across various maturities; bp



Source: J.P. Morgan.

[5] Overview in *Global Fixed Income Markets Weekly*, April 12, 2013.

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Appendix I: Perfect Asset Swaps

CLOs tend to employ PAS for hedging asset currencies, as PAS include a knock out feature, unlike in vanilla swaps. If an asset Credit Event (or prepayment) occurs, PAS terminates earlier and no further coupons are paid with an exchange to swap the recovered (or redeemed) amount to the home currency. In vanilla swaps, an early termination creates a residual hedge to unwind, but with PAS the CLO will not bear this risk. Consider a simple example (Exhibit 8) in which a EUR CLO buys a USD 135mn loan paying Libor + 300bp. Based on an initial FX rate the loan is swapped to EUR, with the CLO paying Libor + 300bp and receiving Euribor +275bp. There are three possible termination scenarios:

- the asset matures: CLO pays USD 135mn and receives EUR 100mn;
- the asset prepays: swap knocks-out, CLO pays USD 135mn and receives EUR 100mn; or,
- the asset experiences a Credit Event: swap knock-outs; if asset recovery is say 40%, the CLO pays USD 54mn and receive EUR 40mn.

PAS pricing incorporates (1) the cross-currency basis, (2) FX risk, (3) credit risk, (4) prepayment risk, (5) any collateral posting requirements, and other factors. Loan amendments (maturity extensions, repricings, etc) may require PAS terms to be renegotiated. Finally, if a Credit Event occurs the manager can typically maintain the PAS for a predetermined period of time (as in loan workouts) or terminate, with a dealer poll determining recovery.

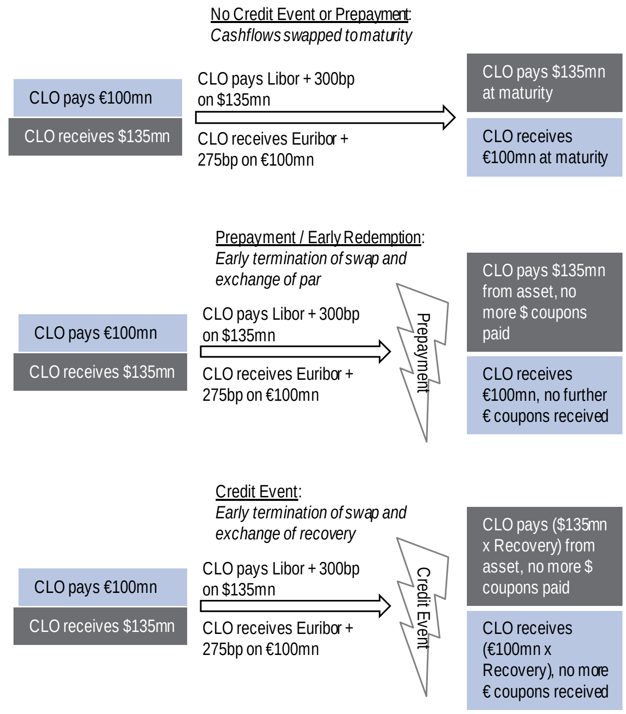
Appendix II: CLO rating agency treatment

Rating agency guidelines vary on CLO FX risk. We touch on Moody's as one example. Moody's evaluates "…whether the additional EL [expected loss] borne by holders of the rated notes remains consistent with the target ratings". If the mismatch is fully covered by PAS, typically no additional modeling is required. If it is left unhedged but is small, certain haircuts may be taken. If it is integral to the risk, a number of currency scenarios are simulated. See *Moody's Global Approach to Rating Collateralized Loan Obligations* (February 27, 2014). In assessing the swap provider, considerations include the counterparty's senior unsecured rating, whether the counterparty agrees to certain collateral provisions, and other factors. See *Approach to Assessing Swap Counterparties in Structured Finance Cash Flow Transactions* (Moody's, November 12, 2013).

Where CLO liabilities are repackaged into different currencies, in addition to the criteria on repackagings, FX rate simulations are run along with an evaluation of swap counterparty default risk (if de-linkage is not achieved in the transaction). See *Moody's Approach to Rating Repackaged Securities* (April 14, 2010).

Exhibit 8: Simplified Perfect Asset Swap (PAS)

USD 135mn leveraged loan paying Libor + 300bp is perfect asset swapped into EUR 100mn paying Euribor+ 275bp



Source: J.P. Morgan.

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