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Global Fixed Income

Trading CSAs

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Trading CSAs

- Classification and features of a CSA
- Best market practice
- Issues with the current approach
- Credit risk mitigation through a CSA
- Case study 1: Lehman default
- Special Case: One-way CSA
- Case study 2: Berkshire Hathaway's equity puts

What is a CSA?

- CSA = Credit Support Annex: Mutual agreement between two market participants which regulates credit support (collateral) for derivative transactions.
- Typical (but non-mandatory) part of an ISDA agreement.
- Defines the terms under which collateral is posted between market participants.
- Most widely used tool to mitigate credit risk from derivatives.

Standard features of a CSA

- Scope: Which derivatives are covered?
- Value: Valuation procedure, dispute settlement?
- Type of collateral: Cash, bonds,...?
- Cost of collateral: Interest on cash?
- How: Frequency of collateral transfer, thresholds, bi-lateral or uni-lateral?

Best market practice

- Four types of derivatives counterparties:
 1. Two-way zero threshold cash CSA (e.g. bank market participant)
 2. Central Clearing houses or Exchanges: daily variation margin and initial margin
 3. One-way (or other non-standard) CSA (e.g. AAA supranational)
 4. No CSA (e.g. small corporate)
- CSA based discounting: Under a zero threshold cash collateral two-way CSA the collateral cost determines the cost of holding a derivative position => appropriate discounting curve determined by interest rate on cash collateral (e.g. EONIA, Fed Funds).
- Market-making trading desks are assumed to only face type one or two counterparties => discounting with EONIA, Fed Funds.
- Types three and four: require valuation adjustments to account for credit and funding risk. Typically handled by internal procedures (reserves or add-ons), dealt with by a specialised desk (e.g. CVA desk).

Desk perspective: Issues for market makers

- Discounting curve mismatch through CSA mismatch.
- Perfect hedge can only be achieved under identical CSA.
- Abundant basis hedging needs, costly and inefficient.
- Complex valuations and hedging needs deter assignments / unwinds => dealers stay locked in complex and illiquid positions => market gets inefficient.
- Any price is subject to CSA => price finding in the broker market more difficult.
- Mitigation: Forward premium for options reduces CSA based valuation differences. Works for FX options and swaptions, not so well for caps/floors.
- Discount curve switching: some CSAs allow choice in the collateral currency or the ability to deliver bonds instead of cash. Whenever a switch in collateral becomes optimal this entails a switch in the discounting curve with associated reheding needs.

Bank perspective: Issues for management

- Front-to-back coordination of trading desks, CVA function, collateral management and bank treasury necessary to align funding and discounting.
- Collateral management: act optimally with respect to the CSAs.
- Bank treasury: adequately service funding needs of derivatives businesses.
- Handling of cross currency exposures.
- Global coordination versus local decision making:
 - Control risk exposure to collateralised counterparties.
 - Minimise initial margin requirements.
- Legacy issues:
 - Benefit of old CSA positions versus cost / benefit of standardisation.
 - Old language: What is a cash settlement value?
 - Dealer polls: what CSA is assumed?

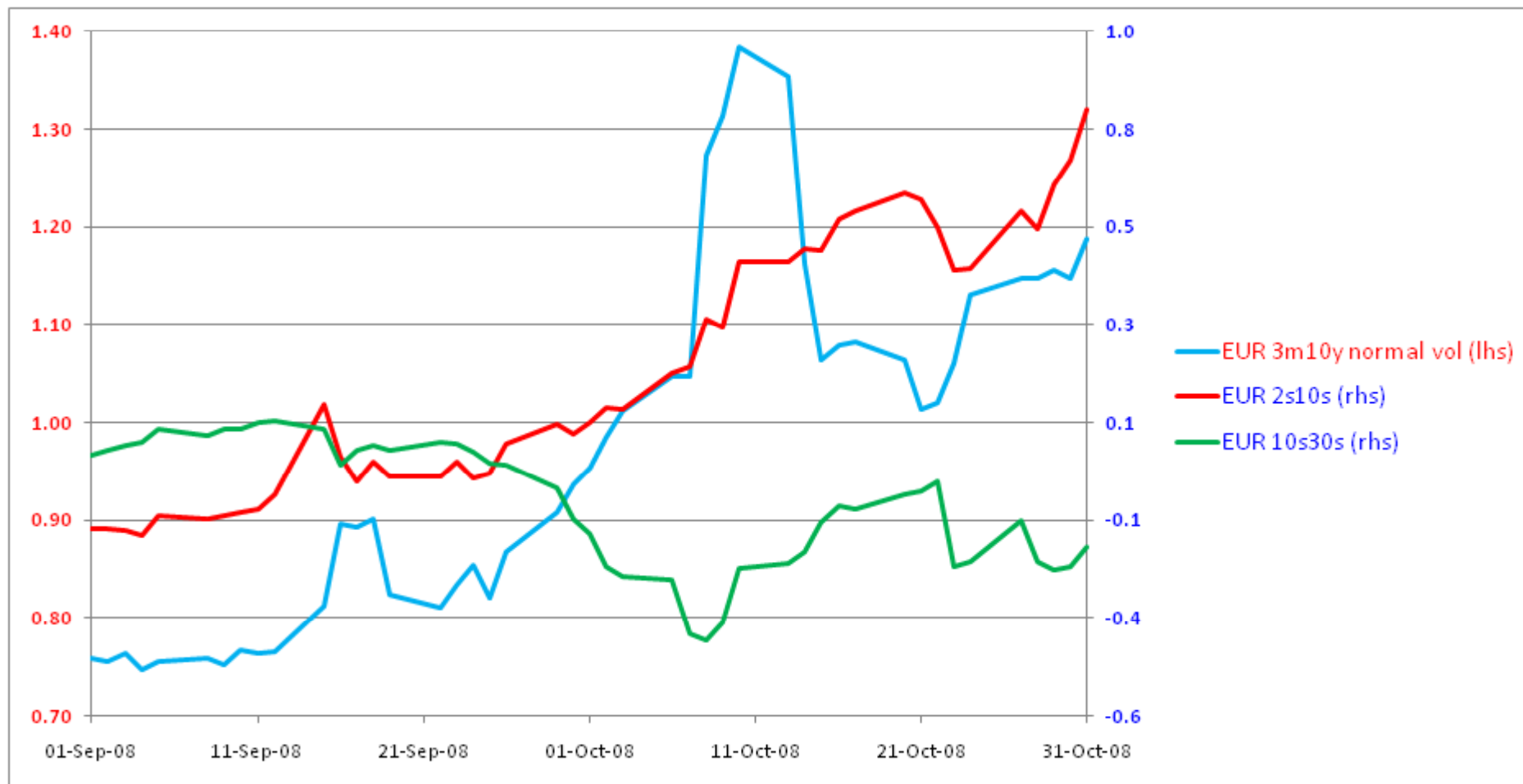
Credit risk mitigation through CSA

- Zero threshold two-way CSA: credit risk is reduced to a jump-to-default scenario (gap risk).
- Upon default: Positions with the defaulting counterparty disappear and need to be replaced. Cost of replacement can be claimed against the defaulted counterparty, recovery subject to uncertainties of the default process.
- What drives the cost of the gap event:
 - Event-induced risk aversion (volatility up, low liquidity, wide bid-offers, fast markets).
 - All-in derivatives position of the defaulted entity.
 - Cumulative need of the market to replace hedges or not to.
 - Exact timing of the hedge replacement process.
- Gap risk could in principle be valued, but correlations upon default needed => hard to estimate.

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- Potential cost of gap risk usually worn on a business level (cost of entering / staying in business).
- Initial margin: Clearing houses / Exchanges charge initial margin to cover gap event.
- Calculation of initial margin: using a variety of techniques from historical analysis to stress scenarios.
- Wrong way risk: awkward positions against a defaulting counterparty, e.g. long gamma or vega, long credit protection.
- Prudence: Control risk positions even to collateralised counterparties.

Case Study 1: The Lehman default (15th September 2008)



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- Risk aversion: vols higher.
- But: 2s10s not steepening as would normally be expected.
- Biggest moves in early October: flattening EUR 10s30s upon the LCH rehedge.

One-way CSA

- Only one counterparty (bank A) obliged to post collateral if the mtm of the derivative position is in favour of the other counterparty (bank B).
- Creates credit and funding risk to bank A. Both can be evaluated with CVA type methods.
- In practice bank B typically has a much better credit rating and hence the funding risk is dominant.
- Determining the funding spread used for the valuation is critical but difficult.
- Often funding charges are subject to more general business considerations (importance of client, future business prospects).

Case Study 2: Berkshire Hathaway's equity puts

- The 2007 annual letter reads:
- “Last year I told you that Berkshire had 62 derivative contracts that I manage. (We also have a few left in the General Re runoff book.) Today, we have 94 of these, and they fall into two categories. (...)

The second category of contracts involves various put options we have sold on four stock indices (the S&P 500 plus three foreign indices). These puts had original terms of either 15 or 20 years and were struck at the market. We have received premiums of \$4.5 billion, and we recorded a liability at yearend of \$4.6 billion. The puts in these contracts are exercisable *only at their expiration dates, which occur between 2019 and 2027*, and Berkshire will then need to make a payment only if the index in question is quoted at a level below that existing on the day that the put was written. Again, I believe these contracts, in aggregate, will be profitable and that we will, in addition, **receive substantial income from our investment of the premiums we hold during the 15- or 20-year period.**

Two aspects of our derivative contracts are particularly important. **First, in all cases we hold the money, which means that we have *no counterparty risk*.** (...)

Analysis

- Berkshire has in essence been given a long dated credit with some equity linked payback.
- Statement suggests no collateral requirements (no CSA or a one-way CSA) => cash premium is fully available for investment.
- Even if credit and funding costs had been correctly charged by the bank counterparties, these would have likely been low when the contracts were entered (2006).
- Interesting asymmetry: funding costs incurred by the banks (either in 2006 or now) versus funding benefit that Berkshire expects upon investing the premium (10% annualised return?).
- Thought experiments:
 - Would banks still enter such contracts now?
 - Would Berkshire have entered these contracts under a two-way CSA?
 - Would Berkshire have entered these contracts with a forward premium payment?