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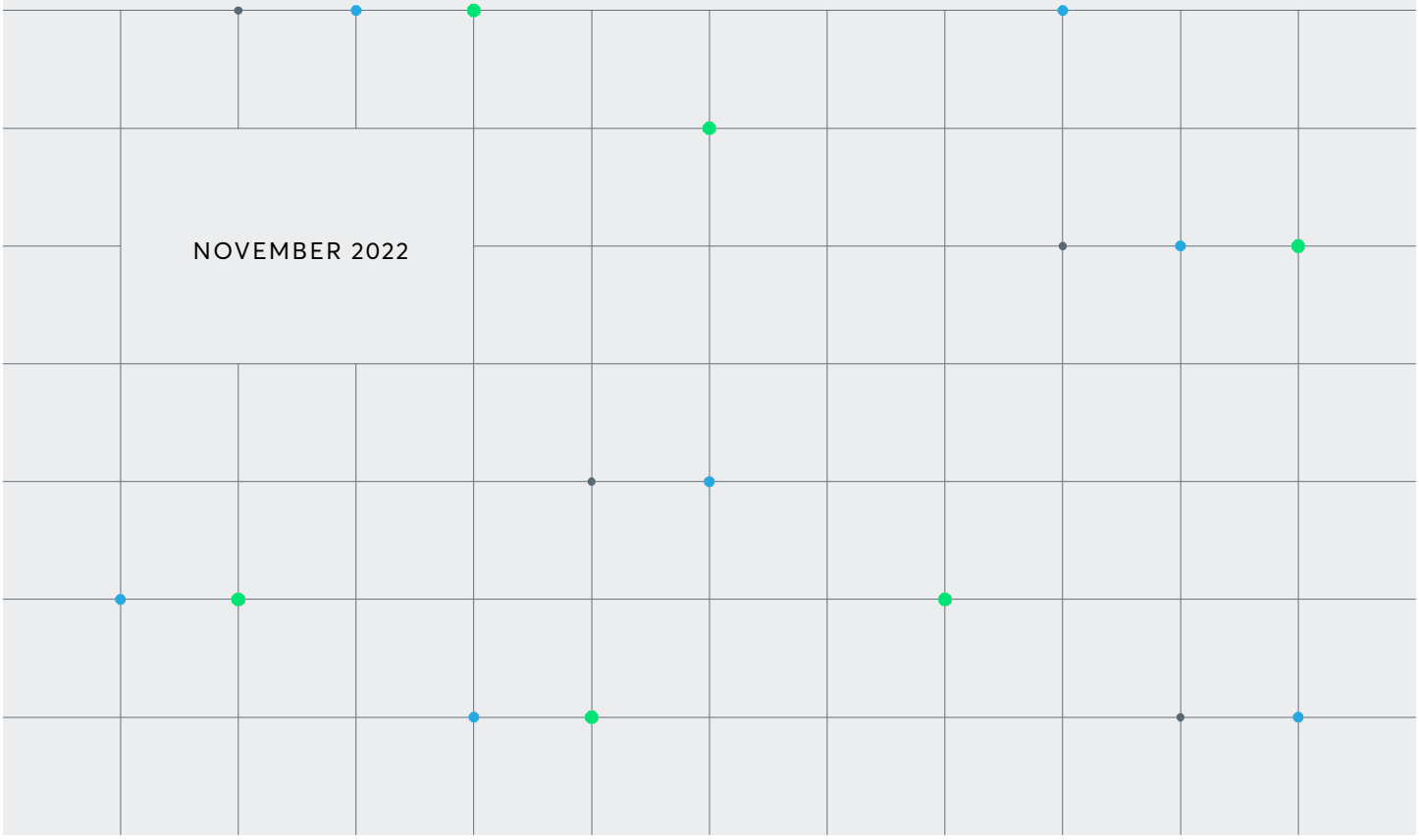
USD Swap Market: Evolution of CCP Basis and Invoice Swap Spread Trading Considerations

By CME Group



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Executive summary:

The primary objective of this paper is to review the following key developments in the USD swap clearing market:

- Discuss the origin and evolution of the USD central clearing counterparty (CCP) basis market.
- Analyze the volatility of the CCP basis as compared to outright swaps and invoice swap spreads.
- Demonstrate advantages of clearing invoice swap spreads at CME Group using portfolio margining compared to the cost of clearing swaps and futures on a standalone basis.

History of USD CCP basis and immediate impacts:

To better understand how CCP specific pricing has evolved in the cleared USD interest rate swap (IRS) market, it is important to recognize the origins of the CCP basis.

In an effort to strengthen the safety of the over-the-counter (OTC) derivatives market, the Dodd-Frank act overhauled the Commodity Exchange Act (CEA) to require the clearing of many derivatives through a CCP. The 2012 CFTC Press Release and associated list of Swaps Required to be Cleared drove the phase-in for mandated clearing of IRS by September 2013. While interdealer activity among major swap participants historically had been cleared at the London Clearing House (LCH), the 2013 mandates effectively phased in mandatory clearing of interest rate swaps for most of the buy-side community.

CME Group's launch of IRS clearing in 2010 led to a choice of CCPs for market participants. While dealers continued to clear dealer-to-dealer (D2D) transactions at LCH, end user customers – ***particularly real money asset managers, insurance companies, government sponsored entities, and regional banks – preferred to clear swaps at CME Group. The reasons cited included a preference for domestic bankruptcy laws of a US-domiciled CCP, the capital efficiencies associated with portfolio margining between cleared swaps and listed futures, the broad range of acceptable non-cash collateral, and return on cash collateral posted as initial margin.***

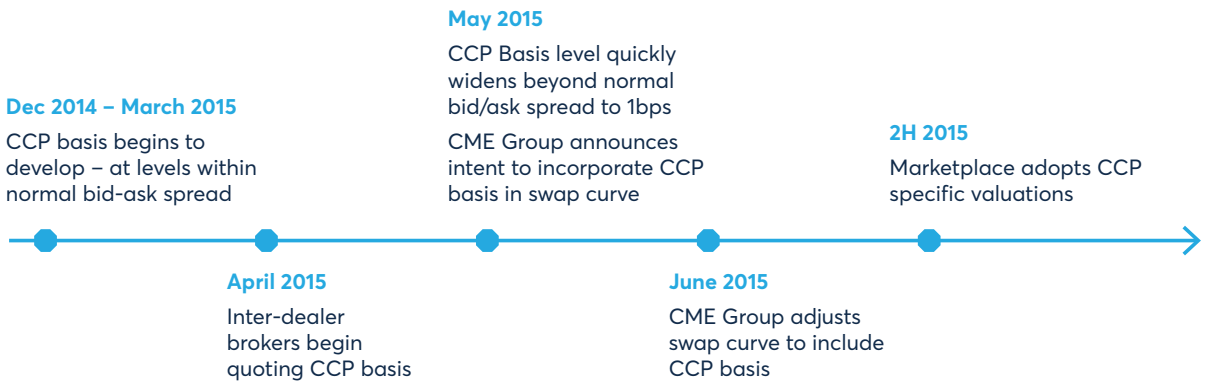
When client clearing first began at CME Group and LCH in 2013, swap pricing levels were consistently quoted the same at both CCPs. Over time, given the nature of CME Group's pay fixed client base, many swap dealers accumulated large directional receive fixed positions at CME Group, which were commonly hedged with pay fixed positions held at LCH. To manage these outsized positions and the associated funding costs, dealers started to adjust their prices for swaps across CCPs (the CCP basis). These adjustments to price levels were designed to balance dealer positions across CCPs, minimize initial margin funding charges, as well as exposure to future changes in the CCP basis level.

When the CCP basis jumped from within the bid/ask spread to 1 bps in May 2015, many dealers were forced to recognize a valuation adjustment on their receive fixed portfolios at CME Group. This market correction created a period of uncertainty for the dealer community and led to different pricing levels of swaps cleared at CME Group vs LCH. The temporary widening of bid-ask spreads was exacerbated by fast money accounts, who migrated some of their swap positions away from CME Group.

Market response to the CCP basis

Following the emergence of the USD CCP basis and the corresponding reduction in liquidity, the marketplace took the following steps:

Figure 1: Timeline of market developments



Data vendors began distributing USD CCP basis quotes soon after its emergence. This allowed a transparent and executable CCP basis market to develop throughout the entire swap curve. Soon afterwards, inter-dealer brokers experienced significant two-way activity flows in the CCP basis market, providing dealers an effective means to balance exposures between CCPs. This facilitated dealers' ability to reduce their exposure to further changes in the CCP basis.

In May 2015, when the basis exceeded the typical bid-ask spread, CME Group immediately announced the intention to incorporate the basis quotes into end of day cleared swap valuations. Once the change was put in place in June, this pushed the broader marketplace to adjust their valuations of swaps cleared at CME Group and temporarily disrupted liquidity as some participants were not prepared to incorporate the adjustment. The combination of new tools for managing changes to the CCP basis market level, the broad adoption of CCP specific valuations as well as the recognition of the associated one-time PNL adjustment, facilitated the return of liquidity to CME Group.

Present-day USD swap market observations

Table 1: Swap market observations and risk metrics for key benchmark tenors

DATA SET START: NOV 9, 2015 END: MAY 28, 2021	2-YEAR			5-YEAR			10-YEAR		
	SWAP RATE	INVOICE SPREAD	CCP BASIS	SWAP RATE	INVOICE SPREAD	CCP BASIS	SWAP RATE	INVOICE SPREAD	CCP BASIS
LATEST OBSERVATION (BPS)	22.9	10.8	0.2	88.3	8.5	1.2	156.6	(2.0)	2.5
AVERAGE OBS (BPS)	147.0	13.0	0.2	167.1	4.0	1.0	194.9	(3.7)	2.1
AVG 22-DAY VOLATILITY (BPS)	5.1	1.7	0.0	6.7	1.5	0.1	7.2	1.5	0.2

Source: Bloomberg

The granular detail provided in Table 1 illustrates a full picture of the CCP basis for key tenor points and common risk factors. Taking daily CCP basis data provided by Bloomberg, we calculated the corresponding rolling 22-day realized volatility and averaged these over the observation period. What can be observed is that the volatility of outright swap rates and invoice swap spreads are considerably larger than the CCP basis. From this information, it can be concluded that a very small portion of the overall risk for cleared swaps or invoice swap spreads from CME Group can be attributed to the CCP basis.

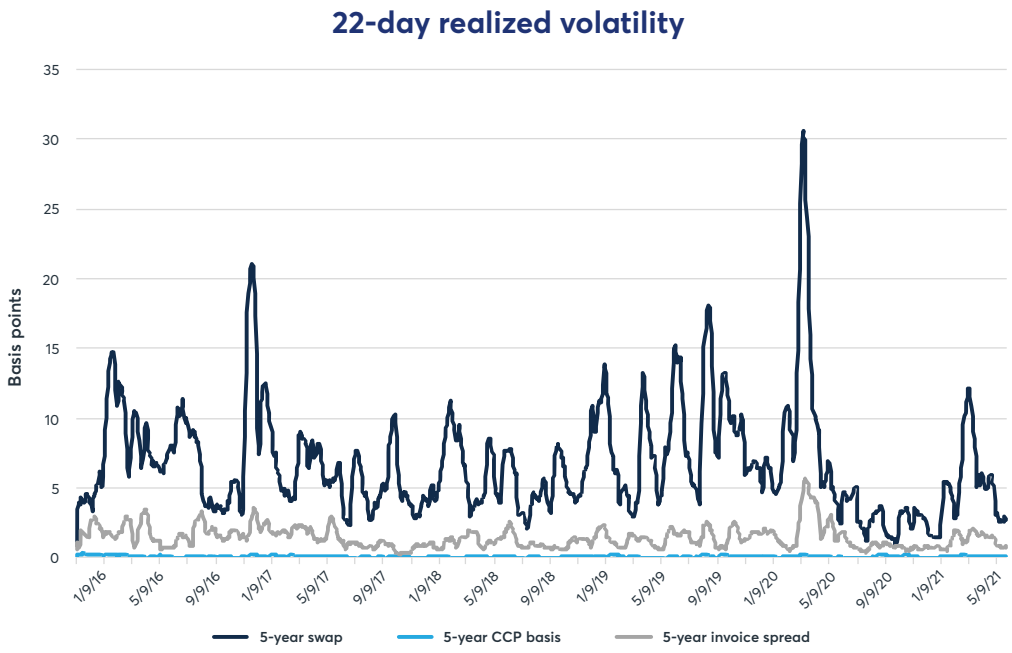
Table 2: Average 22-day volatility of CCP basis compared to swap rate

DATA SET	2-YR	5-YR	10-YR
AVERAGE 22-DAY VOLATILITY OF CCP BASIS COMPARED TO SWAP RATE	0.4%	1.4%	2.3%

Source: Bloomberg

For example, as illustrated in Table 2, the average 22-day volatility for 5-year outright swaps is 6.7 bps, as compared to 0.1 bps for the CCP basis. Working under the assumption that bid-ask spread is the premium charged by swap dealers to absorb risk, this would imply that 1.4% of the bid-ask spread for a 5-year swap cleared at CME Group should be attributed to managing the CCP basis risk.

Figure 2: Volatility of swap rate, invoice swap spread, and CCP basis over time



Source: Bloomberg

As shown in Figure 2, the CCP basis is considerably smaller and more stable over time than the outright swap rates and invoice swap spreads.

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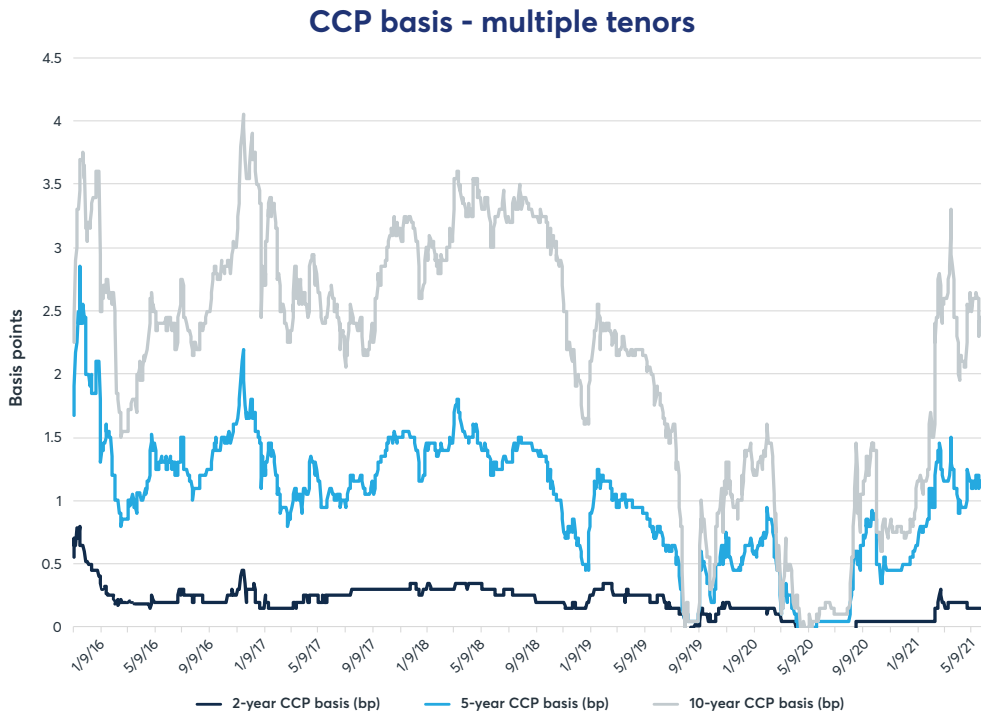
Table 3: CCP basis observation as compared to swap rates and invoice spreads on benchmark tenors

DATA SET START: NOV 9, 2015 END: MAY 28, 2021	2-YEAR			5-YEAR			10-YEAR		
	SWAP RATE	INVOICE SPREAD	CCP BASIS	SWAP RATE	INVOICE SPREAD	CCP BASIS	SWAP RATE	INVOICE SPREAD	CCP BASIS
MIN OBS (BPS)	17.9	(3.5)	(0.1)	24.3	(13.7)	(0.1)	50.6	(22.6)	(0.2)
MAX OBS (BPS)	315.0	36.6	0.8	321.4	16.3	2.9	329.2	11.1	4.1
MIN-MAX SPREAD (BPS)	297.2	40.1	0.9	297.1	29.9	3.0	278.6	33.7	4.3

Source: Bloomberg

Figure 3: CCP basis history by tenor point



Source: Bloomberg

As shown in Table 3, the range of the basis is very tight compared to the range of the corresponding swap rates. This is particularly true for the shorter benchmark tenors as demonstrated in Figure 3.

Additional considerations for relative value trading

Margin offsets between futures and OTC swaps has played a significant role in the growth of liquidity in USD swaps cleared at CME Group.

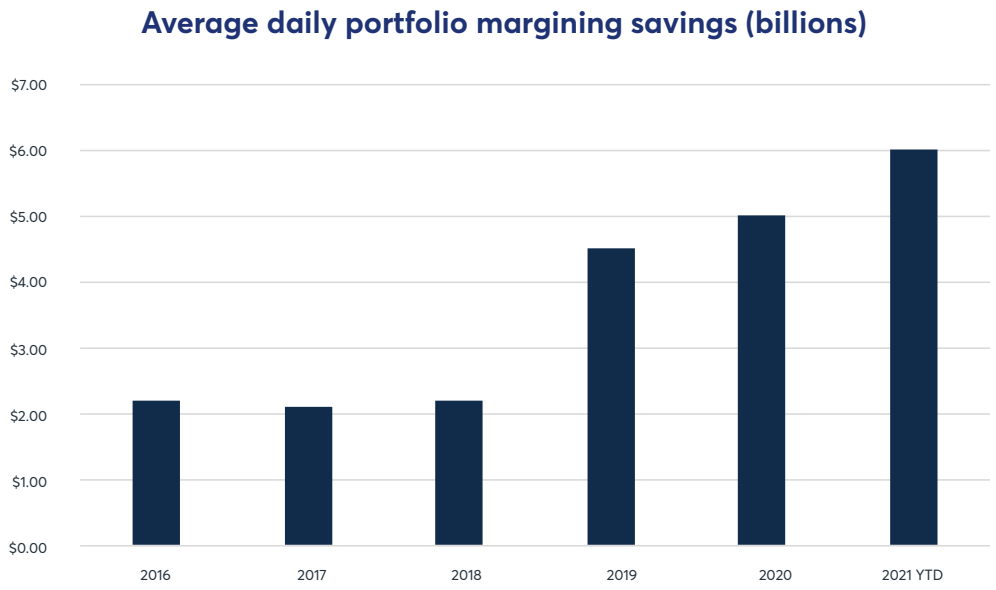
Table 4: Indicative CME Group initial margin requirements for invoice spread trading strategies (bps)

INVOICE SPREAD STRATEGY	MARGIN IF CLEARED SEPERATELY	CME PORTFOLIO MARGIN	MARGIN SAVINGS (BPS)	MARGIN SAVINGS
2-YEAR (TU) TREASURY VS IRS	61.0	21.0	40.0	66%
5-YEAR (FV) TREASURY VS. IRS	66.0	14.0	52.0	79%
10-YEAR (TY) TREASURY VS IRS	70.0	14.0	56.0	80%

**indicative margins based on July 2021 data – CME Group*

As Table 4 illustrates, initial margin requirements can be significantly reduced, particularly for relative value trading strategies, if the swaps and futures are cleared together with portfolio margining enabled at CME Group. One of the major advantages of clearing at CME Group is the unique ability to achieve margin offsets between similar risk profile products across listed interest rate futures/options and cleared OTC derivatives.

Figure 4: Growth in portfolio margining average daily savings at CME Group



Source: CME Group

With 600+ accounts utilizing portfolio margining across 12 clearing members, portfolio margining (PM) at CME Group continues to see significant growth in utilization as more participants focus on maximizing their capital savings on cleared portfolios. Figure 4 highlights the magnitude of realized margin savings from portfolio margining over time.

Margin savings trends are likely to continue as more participants onboard and additional products are made available for cross-margining with cleared swaps. CME Group supports the following products in portfolio margining today:

Futures: Eurodollar futures, Treasury futures, Fed Funds futures, SOFR futures, MAC swap futures

Options on futures: Eurodollar options

OTC: 24 Cleared IRS currencies, USD swaptions

The recent addition of Eurodollar options into portfolio margining has allowed customers to access previously unused excess net option value (NOV) to offset cleared OTC risk. This ability to utilize excess NOV has allowed market participants using portfolio margining to save an additional $1 billion in margin for their cleared portfolios.

Invoice swap spread case study

Invoice swap spreads are commonly traded in the market by relative value market participants to express a view on the spread between US government debt and a similarly dated OTC interest rate swap. The below case study demonstrates the cost savings and corresponding PNL enhancement available when utilizing portfolio margining. For simplicity, CME Group end-of-day settlements were utilized when calculating hypothetical trade PNL.

Invoice swap trade example

March 25, 2021: Enter a short 5-year invoice swap position

Sold 1,000 5-year Treasury Note futures @ 124-1/32

Received fixed @ 0.83065%, swap effective 6/20/2021, maturity 8/31/2025

Swap notional 130,747,367, with DV01: -54,940

May 25, 2021: Position unwind

Bought 1,000 5-year Treasury Note futures @ 124-14/32

Closed out of swap position with NPV of $602,150

Table 5: Example invoice swap spread PNL

TRADE DATE	TREASURY FUTURES	USD SWAP	NET PNL
25 MARCH 2021	-	-	-
25 MAY 2021	(406,250.00 USD)	602,150 USD	195,900 USD

Source: CME Group

Table 6: Example initial margin requirement and funding cost for invoice spread (with and without PM)

	WITHOUT PM	WITH PM	PM SAVINGS
AVERAGE INITIAL MARGIN REQUIREMENT	3,603,806 USD	743,311 USD	2,860,495 USD
MARGIN FUNDING COST OF 3.50%			
COST OF FUNDING (61 DAYS)	21,372 USD	4,408 USD	16,964 USD

Source: CME Group

As shown from Table 5, the PNL on the short 5-year invoice swap spread was $195,900 or approximately 3.6 bps. In addition to this, Table 6 depicts the initial margin requirement of approx. $3.6M for an account not utilizing portfolio margining between cleared swaps and listed futures – significantly more than the $743K margin requirement for an account which is utilizing the program. Assuming an initial margin funding cost of 3.5%, accounts utilizing portfolio margining would earn an additional $16,964 on this trade, or 0.31 bps over the 61-day holding period. The 0.31 bps of additional PNL in this example appears more than enough to cover any potential CCP basis volatility noise and differences in bid/ask spreads, based on the historical basis analysis previously provided.

Conclusion

In stark contrast with the market development that followed the inception of the CCP basis, recent years have shown the CCP basis has been highly stable with volatility under 2.5% of the corresponding swap rates. The marketplace has evolved to the point where the CCP basis is well understood and tools are readily available to monitor and manage any potential risk. Additionally, as depicted in the above case study for invoice swap spreads, historical data has shown that margin efficiencies available via portfolio margining at CME Group can easily outweigh any potential cost associated with managing the CCP basis. This clearly demonstrates the advantages available to participants who choose to clear relative value strategies between swaps and listed futures at CME Group.