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Abstract

The last two phases of the Uncleared Margin Rule went into effect in September 2021 and September 2022. We use regulatory data to analyze the impact these regulatory changes had on NDF (non-deliverable forward) foreign exchange markets. The data suggest that the changes had little impact on total trading activity. However, we observe a substantial increase in the extent to which traders who came into scope during these phases centrally clear their trades. This is consistent with the premise that the rule change lowered the cost of clearing a trade relative to the trade remaining a bilateral contract between the traders. This finding is in contrast to the impact of previous phases in the sense that central clearing was chosen almost exclusively by clearing members in those earlier phases.

Keywords: Uncleared Margin Rule, Central Clearing, Non-deliverable forwards, NDF, Swap Market Regulation

Introduction and Background

In September, 2022 the final phase of the Uncleared Margin Rule (UMR) went into effect in the U.S., as well as most jurisdictions around the globe. The UMR was part of a series of new regulations that followed the 2008 financial crisis, and had the explicit goal of ensuring that collateral was available to offset losses caused by the default of a derivatives trader, which would in turn help reduce systemic risk.² The rule was also seen as a way to encourage central clearing of swaps, and this effect was envisaged as an additional means of reducing systemic risk.

The UMR mandates that if both participants in a swap are under the purview (*in scope*) of the rule, both participants are required to provide collateral (known as *margin* in the derivatives context) for any uncleared swap. The rule also specifies the methodology for determining margins on uncleared swaps, so that entities had regulatory minima on the margin they could choose for their uncleared swap.³

The effect of the rule was to create a different trade-off for the parties to a swap in determining whether to submit a trade for central clearing. Prior to coming into scope of the rule, the trading parties could choose not to centrally clear their trades, in which case they were free to set bilateral margins. After coming into scope, the parties could choose to allow the swap to remain bilateral, in which case mandatory minimum margins would apply. Alternatively, they could choose to submit the swap for central clearing, which would likely result in a lower required margin than for an uncleared swap, but would lead to other costs, as detailed below.⁴ Because the UMR lowered the cost of centrally clearing a swap relative to leaving it uncleared, we anticipate that a larger percentage of trades will be cleared after the UMR went into effect.

The UMR was phased in over time. Phase 1 came into effect in September, 2016, and brought the 20 financial groups (parent companies) with the largest uncleared swap exposure into scope of the rule. These groups comprised a total of 545 entities at the LEI (Legal Entity Identifier) level,⁵ and these entities represented at least one side of about 95% of the USD denominated NDF swaps traded in 2016. The next three phases brought (respectively) 6, 8 and 18 financial groups into scope (we describe the definition of a group more fully in the following Section).⁶ We estimate that phases 5 and 6 brought several hundred groups into scope, so that virtually all traders in NDF markets are now subject to the UMR.

Existing work examines the effect of the UMR on clearing rates for non-deliverable forward (NDF) FX swaps over the first four phases.⁷ As Figure 1 shows, the first two phases seem to have had a substantial effect on clearing rates. For example, comparing the three-month periods before and after phase 1, overall clearing increased from about 5% to more than 15%. In addition, clearing of NDF swaps for trades between two in-scope phase 1 entities rose more dramatically; from roughly 9% before the rule change to 28% after the change.⁸

It is noteworthy that this increase was almost entirely due to changes in the behavior of entities that were Clearing Members (CMs) of the London Clearinghouse (LCH); non-members (entities that are not CMs), even if they were in-scope entities in phase 1, rarely cleared their NDF swaps. The finding that clearing was almost exclusively the province of CMs suggests that non-members face non-trivially higher costs than CMs when clearing a trade. Part of this cost difference derives from a fee that non-members have to pay (over and above the clearinghouse's fee) to a member for providing clearing services. In addition, non-members who have not

cleared trades in the past face costs of establishing the infrastructure necessary to make those transactions. This cost difference has important implications for the likely effects of phases 5 and 6 on clearing, which we discuss in detail below. CMs tend to be the largest financial institutions and we calculate that all current CMs came into scope during first three phases of the rule.⁹

The primary goal of this paper is to examine how phases 5 and 6 of the UMR affected the NDF market. Despite some concern expressed in the trade press,¹⁰ there does not seem to be much change in the total trading activity of the entities that came into scope in these last two phases of the UMR. One change that is associated with these last two phases is that the trades made by these entities are more than twice as likely to be centrally cleared after phase 6 goes into effect than during the period before phase 5. This tendency to centrally clear during the last two phases of the UMR is notable since none of the newly in-scope entities are CMs, and non-CMs rarely centrally cleared in earlier phases. We analyze how phases 5 and 6 affected the NDF market in detail below and also discuss some of the reasons that clearing seems to have become more attractive to non-CMs over time.

The Impact of Phases 5 and 6 on NDF trading

As noted above, the UMR required entities with an uncleared swaps position in excess of a specific dollar threshold to provide margin on their uncleared swaps with other in-scope entities, where the threshold declined over time across six phases. The determination of which entities were in scope at each time is made at the consolidated group level. For example, the determination of whether Swap Dealer A was in scope as part of phase 1 was based on whether the combined uncleared swap positions across all asset classes of all subsidiaries and affiliates (known as AANA) of Swap Dealer A exceeded \$1.5 trillion.¹¹ We use the term ‘group’ to refer to a set of affiliated entities. To determine an entity’s status, we use S&P’s cross-reference services to aggregate financial entities into groups (e.g., place 545 entities into 20 groups for phase 1).

Another regulatory change that followed the 2008 financial crisis was a series of rules mandating enhanced data collection.¹² This study uses regulatory data, provided to the CFTC under these rules, that detail the parties to each swap, as well as the clearing status, and notional trade size for each swap. The data allow us to calculate which groups of entities were likely in-scope during each phase of the UMR. For NDF swaps, the detailed information provided in the regulatory transaction data allows us to determine aggregate NDF trading volume in the market, as well as specific trading volume for each trader.

Figure 2 uses this regulatory data to show the average clearing rate for all entities each month in the NDF market from two months prior to phase 5 implementation to two months after implementation of phase 6. For traders as a whole, we do not see much of a short-term impact of these two phases on clearing rates; clearing rates are fairly similar in the two months before and after each of the phases. To be exact, there is a small immediate decline in clearing associated with the implementation of phase 5, and a slightly larger increase in clearing associated with phase 6. However, there is a large increase in clearing in mid-2022; and a slight upward trend in clearing rates between September 2021 and April 2022. Overall, clearing rates seem to increase from around 30% to the 45% level within the time period. One possible explanation of this

pattern is that higher market volatility in 2022 resulted in higher calculated margins for uncleared swaps (using the SIMM model) making clearing a more attractive option.¹³

Another pattern in the regulatory data is that clearing rates for NDFs differed considerably across currencies, and the change in clearing rates associated with phases 5 and 6 also differed across currencies. As shown in Figure 3, the clearing rates were considerably higher for Asian emerging market/US dollar currency pairs during the summer of 2021 than the clearing rates for Latin American and other currency pairs. All currency pairs show an increase in clearing rates, however clearing rates for Asian currencies reached 50% by October 2022, while clearing rates for other currencies remained below 20%.

Figure 4 shows how the market changed as a result of the implementation of phases 5 and 6. It compares total trading volume in USD notional, total number of transactions, number of unique entities and number of unique counterparty pairs, as well as overall clearing rates for the 2 months period before, and the 2 months period after each phase. Overall, trading volume was slightly higher in the two months following the implementation of phase 5 than the two months prior to the change, while the increase over the four-month period around phase 6 was more substantial. There was a similar pattern in the number of transactions around the implementation of these two phases. The number of unique entities and unique counterparty pairs drops after phase 5 and seems to hold steady before and after the implementation of the last phase. Finally, we observe a slight drop in the clearing rate from the initiation of phase 5, and a slight increase from phase 6.

Overall, while substantial concern was expressed in the trade press about the ability of these entities to prepare for coming into scope,¹⁴ these calculations instead suggest that most entities were able to continue to trade at about the same level of activity after coming into scope. While there is a slight drop in the number of entities in the market, especially following phase 5, trading volumes do not seem to be adversely affected as a result of these regulatory changes.

Changes in the Behavior of Phase 5 and 6 Entities

Both by our estimates and by publicly-available information, phases 5 and 6 increased the number of in-scope groups much more than the previous phases.¹⁵ We estimate that several hundred groups came into scope over this period. Of course, by the nature of the rule, the groups that came into scope during phases 5 and 6 had much smaller swap positions than those in previous phases; phase 5 groups had AANAs of between \$50 and \$750 billion, and phase 6 groups had AANAs of between \$8 and \$50 billion.

Similar to the entities that came into scope in the earlier phases, phase 5 and 6 entities had to alter some aspects of their trading practices once they came into scope. Entities that are not in scope of the UMR are free to choose margins for their uncleared trades. Once in scope, an entity that chooses to continue to trade uncleared swaps needs to determine the margin required under the UMR for each uncleared swap trading relationship with other in-scope entities. Additionally, in many circumstances, they need to post collateral for any uncleared NDF swap.

As was the case for the earlier phases, for some entities, choosing central clearing might make more economic sense than posting the margin required for an uncleared swap. In their promotional materials, the LCH provides examples of positions for which margins would be

lower with central clearing.¹⁶ Another alternative, which is particularly relevant for phase 5 and 6 groups, is to take advantage of an exemption in the rule that allows the parties to a swap for which required margin is below \$50 million to avoid posting margin payments with a custodian. Because the aggregate size of phase 5 and 6 entity positions with each counterparty tend to be smaller than those in previous phases, margin payments may not be required for many phase 5 and phase 6 entities by virtue of this exemption. In addition, this exemption might provide an incentive for an entity to divide its aggregate position among a larger number of counterparties, so that the required margin in each relationship remained below \$50 million.¹⁷

Figure 5 presents the percentage of trades that were cleared by the entities we estimate as coming into scope during phases 5 and 6. The period of our analysis starts in July 2021 and goes until end of October 2022. For the reasons discussed above, we expected that the clearing rate would increase in September 2021 (phase 5) and again the following September (phase 6). In fact, while there is a steady increase in clearing throughout the period of analysis, from about 10% to 15%, there are no jumps in clearing rates around the implementation dates of the two phases. Similar to the effect on the clearing rates of all the entities, there is a significant increase in clearing rates for phase 5 and 6 entities during mid-2022. In addition to the effect that higher margins for uncleared swaps might have on clearing decisions generally, the effect on phase 5 and 6 groups might be larger because of the \$50 million exemption. That is, some smaller entities likely had some trading relationships for which the calculated margin was below \$50 million during the initial months following the initiation of phase 5, but rose above that threshold in 2022. Faced with the requirement to post margin with a custodian for their uncleared swaps, some of these entities instead chose to clear some portion of their trades. While a full analysis of the size of this effect is somewhat beyond the scope of our study (in part, because we do not know the exact required margins for each pairs of traders), there is some evidence consistent with the premise. Specifically, there are slightly, but consistently, higher clearing rates for entities that have positions that likely required margins above \$50 million than those entities with smaller positions.

Figure 6 presents changes in the trading patterns of phase 5 and 6 entities during the two-month period before and after each phase. While there are some fluctuations in terms of trading volumes and number of transactions, both statistics are higher in October 2022 than they were in July 2021. There is not much change in number of unique entities trading, but there is a small drop in number of unique counterparty pairs. This suggests that entities were not often splitting their positions across more counterparties in order to remain below the \$50 million threshold with each counterparty. In terms of clearing rates, there is a sizeable increase (1.1 percentage points) around phase 5, but a slight one (0.2 percentage points) around phase 6. Overall, however, the clearing rate increases by 6.5 percentage points over the period.

One aspect of our findings for phase 5 and 6 entities is worth emphasizing. Existing work shows that for phase 1 entities, virtually all of the swaps that were centrally cleared had clearing members (CMs) of LCH on both sides.¹⁸ Only 2% of trades that did not have CMs on *both* sides were cleared during the year following initiation of the first phase. In contrast, even though none of the phase 5 and 6 entities were CMs, almost 9% of the trades in which they were on one side were cleared even before phase 5 began, and that percentage rose to over 15% after phase 6 went in effect.¹⁹

We speculate that one reason for this difference is that the phase 1 non-CMs were large entities that had in-house capabilities of calculating margin, setting up documentation, tracking variation margin, and handling similar costly bookkeeping activities associated with maintaining an open swaps position. The entities who came into scope during phases 5 and 6 were smaller, and many may instead turn to third-party providers to perform these functions.²⁰ This may lead to a larger increase in costs of trading uncleared swaps for these entities compared to phase 1 non-CMs. An additional factor that may have promoted clearing is the entry of new clearing brokers on the LCH – clearing members that provide clearing for other entities.²¹ This increased choice has lowered the cost of clearing for market participants, according to the LCH.

Conclusion

We use regulatory data to examine how NDF trading changed as new entities came into scope of the UMR in the past two years. We find that trading volume remained fairly steady in the market as a whole, while more entities began clearing their swaps. However, unlike the initial phases of the rule, we do not observe the primary changes in clearing rates occurring around the phase 5 and 6 implementation dates. Instead, the largest increases in clearing occurred during the middle of 2022, perhaps reflecting higher margins due to greater market volatility. In addition, more non-CMs deciding to centrally clear in the last two phases of the rule, compared to the earlier phases. All of these changes can be seen as predictable consequences of the margin requirements of the UMR.

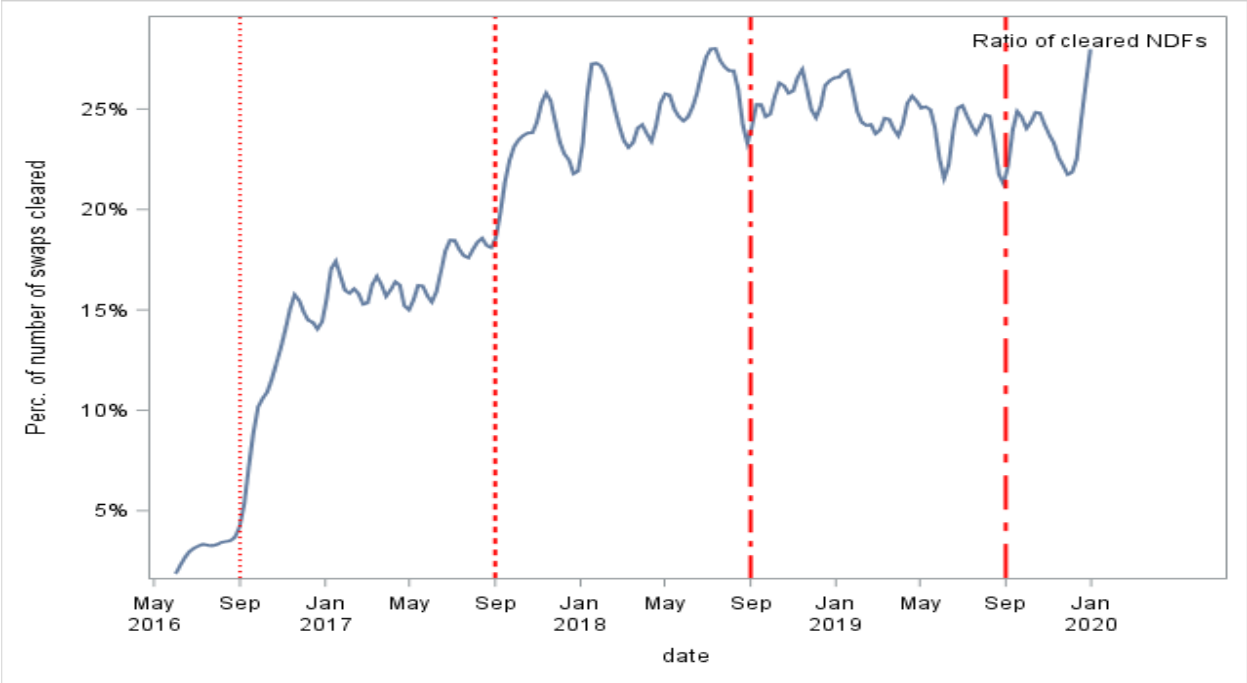


Figure 1. The figure shows the percentage of NDF swaps cleared between June 2016 and the end of 2019. The thin dotted line shows the implementation date for Phase 1 of the UMR. The other 3 vertical lines show Phases 2 – 4. The figure shows that clearing rose dramatically after the implementation of phase 1, and to a lesser extent after phase 2. Phases 3 and 4 do not seem to have affected clearing. (Source: Onur, Reiffen and Sharma (2021))

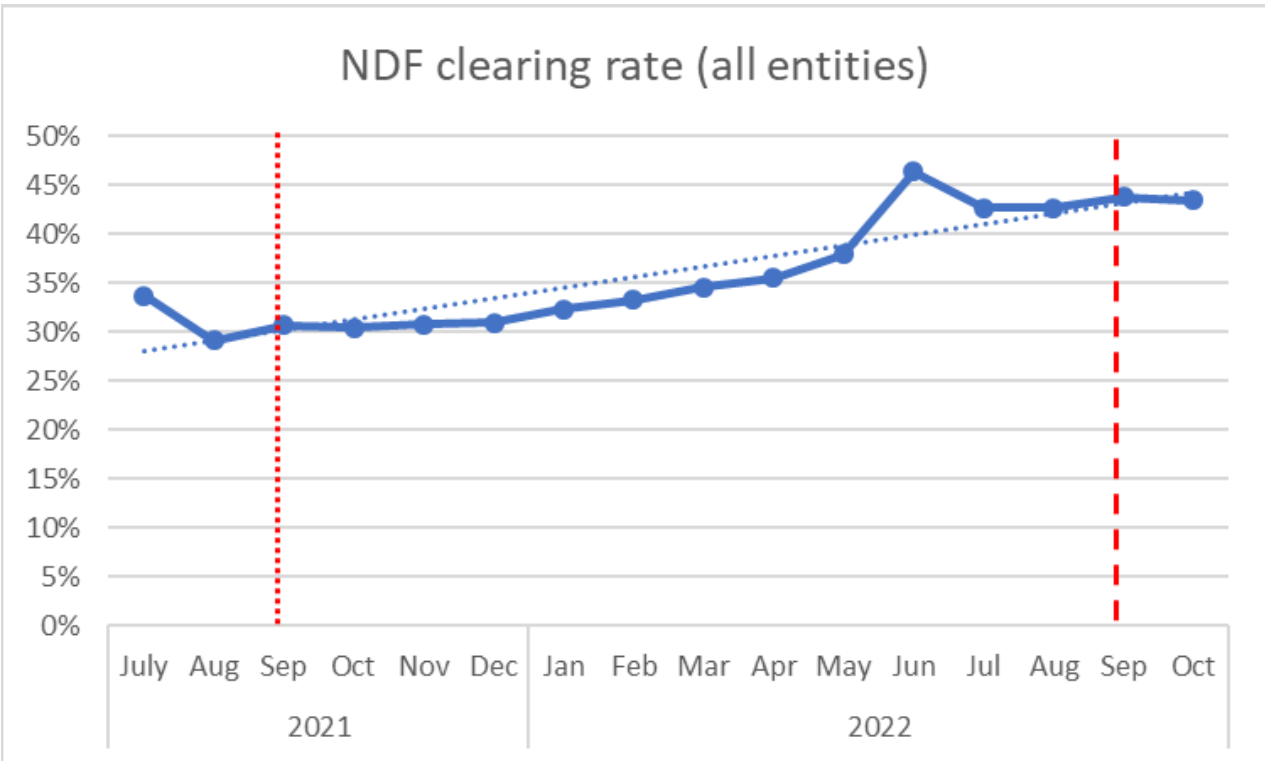


Figure 2. The figure shows the monthly percentage of NDF swaps cleared between June 2021 and October 2022 for all entities. The dotted red line shows the date of phase 5 implementation, and the dashed red line shows the date of phase 6 implementation. (Source: CFTC data and calculations). The dotted blue line is the trend over this time period. The figure shows a slow but steady increase in clearing over the period.

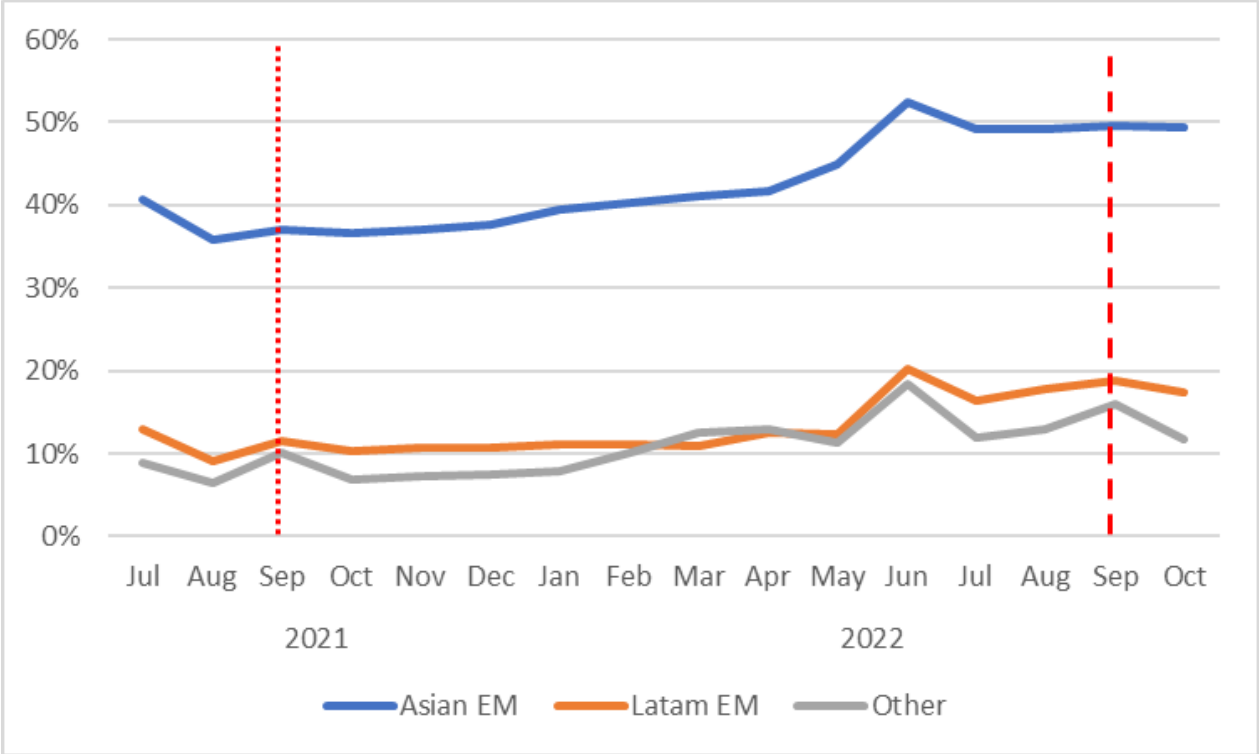


Figure 3. The figure shows the percentage of NDF swaps cleared between June 2021 and October 2022 for all entities for Asian emerging market currencies, Latin America emerging market currencies, and other currencies. The dotted red line shows the date of phase 5 implementation, and the dashed red line shows the date of phase 6 implementation. (Source: CFTC data and calculations). The figure shows that while all 3 sets of currencies had increased clearing over the period, clearing is much more common for Asian currencies during this period.

	8 weeks before phase 5	8 weeks after phase 5	8 weeks before phase 6	8 weeks after phase 6
Total trade volume \$bn	8,497	8,628	6,556	8,080
Total # trades	1,262,123	1,281,528	1,025,394	1,305,380
# unique entities	6,161	5,593	5,441	5,589
# unique counterparty pairs	16,099	14,307	14,187	14,486
clearing rate	31.1%	30.7%	42.5%	43.8%

Figure 4. The figure shows NDF trading activity by all entities before and after phases 5 and 6. (Source: CFTC data and calculations).

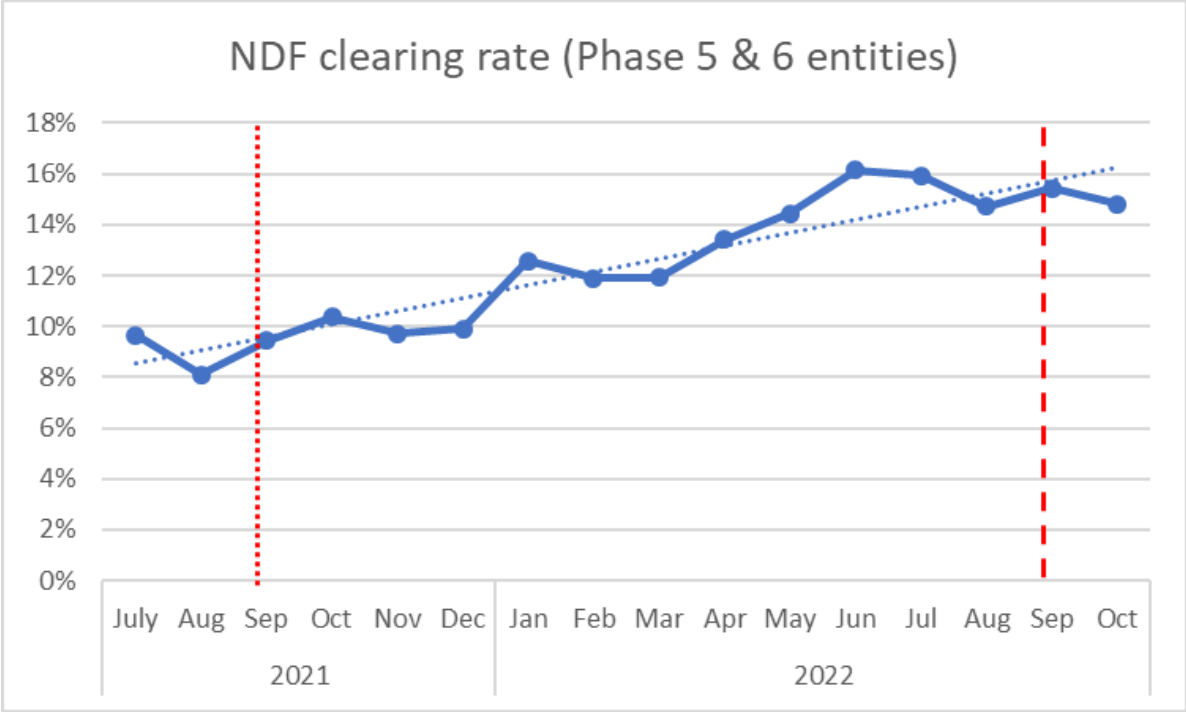


Figure 5. The figure shows the percentage of NDF trades that were centrally cleared by entities we estimate as coming into scope during phases 5 and 6. The dotted red line shows the date of phase 5 implementation, and the dashed red line shows the date of phase 6 implementation. (Source: CFTC data and calculations). The dotted blue line is the trend over this time period. The figure shows a larger increase in clearing over the period than for the NDFs as a whole.

	8 weeks before phase 5	8 weeks after phase 5	8 weeks before phase 6	8 weeks after phase 6
Total trade volume \$bn	1,234	1,263	1,203	1,320
Total # trades	215,179	203,053	193,125	236,297
# unique entities	1,945	1,915	1,848	1,940
# unique counterparty pairs	5,378	4,970	4,771	5,021
clearing rate	8.7%	9.8%	15.0%	15.2%

Figure 6. The figure shows trading activity by entities we estimate as coming into scope during phases 5 and 6, before and after phase 5 and phase 6 implementation dates. (Source: CFTC data and calculations).

References and Notes

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² The UMR was the US rule adopted to reflect the recommendations of the Basel Committee on Banking Supervision and the International Organization of Securities Commissions 'Global Framework for Margin Requirements (September 2, 2013). Other G-20 countries imposed similar requirements that took effect in the same general time period. The rule was also seen to provide broader macroprudential benefits, through the reduction of the financial system's vulnerability to potentially destabilizing procyclicality and limiting the build-up of uncollateralized exposures. See, <https://www.fsb.org/wp-content/uploads/R191118-1-1.pdf>.

³ There are some relevant exceptions; the rule does not apply to inter-affiliate transactions for the most part, and does not apply to non-financial entities. Additionally, as discussed below, collateral only needs to be exchanged if the calculated collateral for the trade is more than \$50 million.

⁴ Roberson, Michael (2018) "Cleared and uncleared margin comparison for interest rate swaps." *CFTC Working paper*. More generally, the relevant comparison is based on the margins required for the entire portfolio. For a discussion of issues relating to the role of netting of positions in calculating margins for a portfolio, see Darrell Duffy and Haoxiang Zhu (2011) "Does a central clearing counterparty reduce counterparty risk?", *Review of Asset Pricing Studies*, 1, 74-95.

⁵ For a discussion of LEIs, see <https://www.gleif.org/en/about-lei/introducing-the-legal-entity-identifier-lei>. The 545 entities are those under US jurisdiction.

⁶ See, Robert M. Smith "UMR phases 5 & 6: Margin rules to alter derivatives market", *Bloomberg Intelligence*, September 1, 2021.

⁷ See Esen Onur, David Reiffen and Rajiv Sharma, (2021), "The Impact of Margin Requirements on Voluntary Clearing Decisions" (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3753050). They focus on NDF swaps

because it is the largest category of swaps for which the UMR applies, but the clearing decision remains voluntary for the traders.

⁸ Part of the reason for the increase in clearing in late 2017 might be due to another change that was part of the UMR. Starting in September, 2017, variation margin (which is essentially replenishing collateral after adverse price changes) was required for all uncleared swaps. This may have also induced greater clearing.

⁹ See <https://www.lch.com/membership/member-search>

¹⁰ See, e.g., Helen Bartholomew “Phase five margin queues spur calls for custody revamp” *Risk.net*, September 30, 2021.

¹¹ The determination is based on the average AANA over a 3-month period.

¹² We use data collected under Part 45 of the CFTC’s regulations, which was amended in 2012. See 17 C.F.R. Part 45, <https://www.ecfr.gov/current/title-17/chapter-I/part-45?toc=1>.

¹³ See, e.g., Helen Bartholomew “Phase six margin cohort may exceed estimates as vol bites” *Risk.net*, July 29, 2022 (<https://www.risk.net/derivatives/7952651/phase-six-margin-cohort-may-exceed-estimates-as-vol-bites>).

¹⁴ See, e.g., William Shaw “Asset Managers Race Against the Clock to Meet Derivatives Rules” *Bloomberg News*, July 7, 2022, <https://www.bloomberg.com/professional/blog/asset-managers-race-against-the-clock-to-meet-derivatives-rules/>

¹⁵ See, [Robert M. Smith](#), Reference 6.

¹⁶ See *risk.net*, October 13, 2022, <https://www.risk.net/insight/risk-management/7954822/umr-and-the-growth-of-client-clearing>.

¹⁷ The trade press suggests that this option was a consideration for some Phase 5 and 6 entities. See, e.g., Helen Bartholomew, Reference 10. Also see Amy Caruso of ISDA who noted “firms may look to diversify their trading with additional counterparties to remain under the IM threshold per counterparty group.” (<https://www.risk.net/market-access/markets/7946326/lessons-from-umr-phase-five>)

¹⁸ See Onur, Reiffen and Sharma (2021), reference 7.

¹⁹ Note that the counterparties in the swaps made by Phase 5 and 6 entities were almost always entities that were in-scope from previous phases.

²⁰ The ISDA Standard Initial Margin Model (ISDA SIMM) provides a common methodology for the calculation of margin, and a free license to use it is available to Phase-five and Phase six entities. Third party providers such as AcadiaSoft also provides that services, as well as documentation, facilitating margin transfer, etc.

²¹ See *risk.net*, reference 16.