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### EXECUTIVE SUMMARY

The CFTC's uncleared margin rule (UMR) and clearing requirement do not apply to legacy swaps, that is, to swaps an entity executed before it became subject to those regulations.

Market participants are currently seeking clarification on which swap amendments and life-cycle events would be deemed to turn a legacy swap into a new swap and which would leave a swap's legacy status in place. Certain of these changes to swap contracts arise in the normal course of business, e.g., from compression and novations, while others are now arising from extraordinary events, like the transition away from IBOR rates and Brexit.

The purpose of this paper is to inform regulators about the prevalence of legacy swaps relative to the overall swaps market, and the timelines under which swaps holding legacy status are expected to roll off on their own.

Overall, the evidence presented here shows that legacy swaps with respect to the UMR constitute a very small portion of swaps markets and that legacy swaps with respect to the clearing requirement constitute a trivial portion of swaps markets. More specifically, this paper finds that with respect to the UMR:

- Legacy swaps comprise only 10% of total (cleared and uncleared) outstanding IRS notional amount, with less than 1/3 of that amount maturing past 2025;
- Legacy swaps comprise about 15% of total outstanding FX swaps notional amount, with less than 1% of that maturing past 2025;
- Legacy swaps comprise 32% of total outstanding index CDS, with 21% of that—or about 7% of the total—maturing past 2025;
- About 7% of total outstanding IRS are legacy swaps based on IBOR reference rates; and
- While legacy swaps do not comprise a large fraction of outstanding swaps, they do comprise a significant fraction of the uncleared swaps of particular market sectors, for example, asset managers, insurance companies, and pension funds.

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<sup>1</sup> Office of the Chief Economist, U.S. Commodity Futures Trading Commission ("CFTC"). While this paper was produced in the authors' official capacity, the views expressed here are those of the authors and do not necessarily reflect the views of other Commission staff, the Office of the Chief Economist, or the Commission. The authors would like to thank Rafael Martinez and Melissa D'Arcy for helpful comments and suggestions.

## INTRODUCTION

Requiring central clearing for standardized swap positions and the exchange of margin for uncleared swaps were two major swaps market reforms proposed in the wake of the 2008 financial crisis. The CFTC's clearing requirement was adopted in 2012 and took effect in 2013, starting with the most liquid CDS and IRS contracts (e.g., vanilla fixed-floating swaps in super-major currencies). The clearing requirement was further expanded in 2016 to include IRS contracts in nine additional major currencies. More recently, requirements for the exchange of margin for uncleared swaps are currently partway through implementation. Variation margin exchange for all uncleared swaps (and all non-exempt participants) has been required in CFTC markets since March of 2017. Initial margin exchange for all uncleared swaps is being phased in over time. Phase 1, which included the largest market participants, started in September of 2016; Phase 2, for slightly smaller firms, began in September 2017. Full phase-in is currently scheduled for September 2020, as Phase 5. As the markets adjust to comply with these new rules, participants have asked for clarification regarding existing legacy swaps that were executed prior to the implementation of these rules and therefore not subject to the new requirements.

A key concern is what type of contract amendments would bring a legacy swap into scope for either of these rules. Swap terms can be, and often are, amended during the life of a contract, for instance through common risk-management practices such as compression and novation. Additionally, market-driven movements like reference rate reform and geo-political situations like Brexit could lead to changes or amendments to many existing legacy swaps in the near future.

Because of this list of potentially major changes, market participants are seeking clarity about where legacy status may be lost so they can effectively manage their risks and compliance costs. Included in this are requests to regulators that certain types of amendments do not result in lost legacy status. The purpose of this paper is to help guide regulators in their responses to these relief requests by providing empirical estimates on the current size and scope of legacy swaps under the uncleared margin and clearing rules.

## DATA AND METHODOLOGY

This study uses the methodology from the "Initial Margin Phase 5" OCE staff paper<sup>2</sup> released in October 2018 to classify legal entities into the five phases of the UMR (or, where applicable, notes that an entity is exempt). This classification is then applied to data on all uncleared swaps reported by U.S. reporting entities, including open interest rate swaps (IRS), index credit default swaps (CDS), and FX swaps positions as of December 14, 2018. Since this analysis is based off a fixed point in time, any newly executed legacy swaps would add to the numbers presented. Data for all of these products are available to the CFTC through reporting by Swap Data Repositories (SDRs). Data on IM currently exchanged on these positions was not available, so the extent of voluntary margin exchange for legacy swaps could not be identified.

The primary focus of this work is to identify swaps considered legacy under the uncleared margin rule and clearing requirement. More detail on the criteria for legacy status in each case is below. While it is possible for a single swap to hold legacy status under both rules, the authors found it most helpful to analyze each rule separately to provide a clear estimate of the size and scope of each set. Additional

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<sup>2</sup> "Initial Margin Phase 5" by Richard Haynes, Madison Lau, Bruce Tuckman. CFTC research papers are available at: <https://www.cftc.gov/About/EconomicAnalysis/ResearchPapers/index.htm>

issues like reference rate reform and Brexit were also analyzed in the context of the uncleared margin rule.

### **Legacy swaps determination under the Uncleared Margin Rule**

This analysis classifies uncleared swaps into one of 3 categories, using a combination of the date the swap was executed, the types of counterparties involved, and the swap terms.

1. **In-scope swaps** are swaps that are currently subject to the uncleared margin rule. These swaps were transacted after the relevant rule took effect (i.e., both counterparties of the swap were captured by the relevant phase), neither counterparty is a commercial end-user, and at least one counterparty is a swap dealer. As of May 2019, the first three phases of the rule have taken effect.
2. **Legacy swaps** are swaps that would be subject to the IM rule based on the swap counterparties, but were transacted before the relevant phase took effect. Otherwise, they meet all the criteria for in-scope swaps. Because Phases 4 and 5 have not yet taken effect, all uncleared swaps for Phase 4 and 5 entities are considered legacy swaps for the purposes of this analysis and are identified by phase in the summary output.
3. **Out-of-scope swaps** are swaps that will never come into scope for the current uncleared margin rule. Swaps may be exempt from the rule for one or more of the following reasons: one of the counterparties is a commercial end-user, neither counterparty is a swap dealer, at least one counterparty is too small to be captured by any of the five phases, or the trade involves a physically settled FX product. Due to data limitations, any swaps where either counterparty could not be identified were placed in the out of scope category.

### **Legacy swaps determination under the clearing requirement**

This analysis classifies swaps into the same 3 categories as above, with definitions adjusted to be relevant to the clearing requirement<sup>3</sup>.

1. **Cleared swaps** are swaps that are currently cleared. No distinction is made between swaps that were cleared voluntarily or because they were subject to the clearing requirement.
2. **Legacy swaps** are uncleared swaps that fall into one of the CFTC's clearing rule's product categories, but were transacted before the relevant clearing requirement took effect. In addition, we require at least one counterparty to be a U.S. entity<sup>4</sup>, and exclude swaps where one or more counterparties is a commercial end-user<sup>5</sup>.
3. **Out-of-scope swaps** either do not meet the product specifications of the CFTC's clearing requirement, do not have at least one U.S. counterparty, or involve a commercial end-user.

Both the 2012 and 2016 clearing rules were implemented in phases. Compliance with the 2012 clearing rule was phased by specific entity types that are not identifiable in the currently available regulatory

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<sup>3</sup> CFTC clearing rules and additional information are available on the CFTC's website:

<https://www.cftc.gov/LawRegulation/DoddFrankAct/Rulemakings/ClearingRequirement/CDFCClearingReq.html>

<sup>4</sup> This is a simplifying assumption.

<sup>5</sup> Available data did not support consideration of additional exceptions and exemptions from the CFTC's clearing requirement (e.g., the exemption for qualifying cooperatives and other no-action relief granted by CFTC staff).

swaps data.<sup>6</sup> Therefore, any swaps transacted before December 2012 that meet the product and entity specifications detailed above are flagged as legacy in this analysis. This is a simplifying assumption that may classify fewer swaps as legacy than are currently held; however, given the low number of swaps executed during that period that are still currently open, the authors believe this difference does not have a material impact on the included estimates. Compliance with the 2016 clearing rule was phased by product types and currencies which can be clearly identified in the available regulatory data. Therefore, swaps identified as legacy under the 2016 expansion of the clearing requirement reflect the relevant effective dates detailed in the final rule.<sup>7</sup>

### **Reference rate reform and Brexit-impacted swaps**

This paper also estimates the size of the open swap market tied to IBOR rates targeted for reference rate reform as well as swaps between U.S. and UK counterparties that could be impacted by Brexit if the current agreement<sup>8</sup> is disrupted. Because the size of the legacy swap category for the clearing requirement is relatively small, analysis of these swap categories focuses on UMR legacy status<sup>9</sup>.

## **FINDINGS**

Table 1 shows the total outstanding gross notional of swaps, broken down into the UMR categories (in scope, legacy and out-of-scope). Each asset class has a significant notional amount of swaps that are not in scope of the rule, often because one or more counterparties are out of scope. Because physically settled FX swaps are exempt from the uncleared margin rule, FX also has a large notional of out-of-scope swaps due to “Product” (this category is not applicable to CDS or IRS). A small but noticeable amount of swaps are out of scope due to a lack of information about the counterparties and may be placed into other categories as the quality of the swap data improves.

In all asset classes, swaps projected to be legacy under phase 5 are the largest legacy group. This is consistent with the findings of the “Initial Margin Phase 5” paper (cited above), which this research builds upon.

The final two columns in the table (the “% of Uncleared” and “% of Total” columns) show the percentage of the total outstanding uncleared and combined cleared and uncleared notional accounted for by each category and asset class. As is necessary, legacy swaps as a percentage of the total market is smaller than as a percentage of the uncleared market. In some cases, the differences are significant. The difference is most obvious in the IRS market where approximately 80% of the outstanding notional is now cleared; where legacy IRS swaps represent just under half of all uncleared swaps, they represent a much smaller 10% of all swaps. The difference is smallest in the case of FX markets, where clearing is relatively rare. However, because the average tenor of FX swaps is relatively low, most non-exempt uncleared swaps for entities in the first few Phases are now in-scope.

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<sup>6</sup> Compliance with the 2012 clearing requirement was also phased-in by product type for one class of CDS, but available data was not sufficiently detailed to include that in this analysis. Again, these simplifying assumptions are unlikely to have a material impact on the overall estimates for legacy swaps.

<sup>7</sup> Clearing Requirement Determination Under Section 2(h) of the Commodity Exchange Act for Interest Rate Swaps, 81 FR 71202 (Oct. 14, 2016).

<sup>8</sup> February 25, 2019, “Joint Statement by UK and US Authorities on Continuity of Derivatives Trading and Clearing Post-Brexit”, <https://www.cftc.gov/PressRoom/PressReleases/7876-19>

<sup>9</sup> ESMA Press Release, Feb 18, 2019: “ESMA to Recognize Three UK CCPs in the Event of a No-Deal Brexit” <https://www.esma.europa.eu/press-news/esma-news/esma-recognise-three-uk-ccps-in-event-no-deal-brexit>

A key concern for regulators considering granting relief for legacy swaps is how long the legacy swaps will remain open in the market. Table 2 shows the scheduled expiration of legacy swaps bucketed into a few relevant time periods. The Pre-Phase-5 group includes swaps which will mature prior to September 1, 2020 – the effective date of the final phase of the UMR. The next bucket includes swaps scheduled to expire between September 1, 2020 and September 1, 2025. Note that a large percentage of legacy swaps are in this bucket, thus scheduled to expire within 5 years of the final UMR phase implementation (79% of CDS legacy and 68% of IRS). In all asset classes studied, less than one-third are expected to remain open beyond 2025. FX is an obvious outlier since most FX swaps are short-dated, driving 89% expected to expire prior to the phase 5 of the UMR. Any new, legacy swaps executed after the reference date would add to these totals, however, all of these numbers may overestimate how long legacy swaps may remain active since many swaps are terminated prior to maturity for a variety of reasons.

**Table 1: Summary of CFTC-Regulated Swaps in UMR Categories**

Asset Class	IM Legacy Flag	Swap Phase	Gross Notional*	% of Uncleared**	% of Total***
CDS Index	In-Scope		513,675	20%	12%
	Legacy	Phase 1-3	362,232	14%	8%
		Phase 4	131,096	5%	3%
		Phase 5	907,398	36%	21%
	Out-of-Scope	Entity	364,686	14%	8%
		Unknown	258,574	10%	6%
Total CDS Index	<b>Uncleared Total</b>		<b>2,537,661</b>	<b>100%</b>	<b>58%</b>
	<b>Cleared Total</b>		<b>1,864,097</b>	<b>--</b>	<b>42%</b>
	<b>Cleared and Uncleared Total</b>		<b>4,401,758</b>	<b>--</b>	<b>100%</b>
FX	In-Scope		10,487,176	19%	18%
	Legacy	Phase 1-3	500,866	1%	1%
		Phase 4	3,655,977	6%	6%
		Phase 5	5,298,879	9%	9%
	Out-of-Scope	Entity	1,903,701	3%	3%
		Product	32,705,306	58%	57%
Unknown		1,753,195	3%	3%	
Total FX	<b>Uncleared Total</b>		<b>56,305,100</b>	<b>100%</b>	<b>98%</b>
	<b>Cleared Total</b>		<b>1,117,379</b>	<b>--</b>	<b>2%</b>
	<b>Cleared and Uncleared Total</b>		<b>57,422,479</b>	<b>--</b>	<b>100%</b>
IRS	In-Scope		15,872,037	27%	6%
	Legacy	Phase 1-3	10,431,937	18%	4%
		Phase 4	5,330,242	9%	2%
		Phase 5	11,477,073	20%	4%
	Out-of-Scope	Entity	9,028,572	16%	3%
		Unknown	5,827,388	10%	2%
Total IRS	<b>Uncleared Total</b>		<b>57,967,249</b>	<b>100%</b>	<b>21%</b>
	<b>Cleared Total</b>		<b>220,850,650</b>	<b>--</b>	<b>79%</b>
	<b>Cleared and Uncleared Total</b>		<b>278,817,899</b>	<b>--</b>	<b>100%</b>

\* Notional in Millions of USD

\*\* Percentages are based on totals for each asset class

\*\*\* Percentage of Total Cleared plus Uncleared Notional

The tables in Appendix A detail how legacy swaps under the UMR break down by industry type. Each industry's table shows totals relative to that industry. Table 3 shows the total legacy notional in each industry, ranked largest to smallest by the total notional across all asset classes. The majority of legacy

CDS (outside of swap dealers) is currently held by asset managers and hedge funds. Hedge funds are also a primary holder of legacy IRS, along with banks. Finally, pension funds and insurance companies have a non-trivial amount of IRS notional; the majority of that notional holds legacy status under phase 5 of the UMR. Therefore, the final phase of the UMR may significantly impact these industries.

In all of these industry groups except swap dealers, the legacy swap notional entities hold may mostly be due to the fact that these entities have not yet been scoped in. Once all five phases are implemented, hedge funds and asset managers may no longer be as dominant in the legacy category. Since swap dealers are on either side of most swap transactions and many of them were captured in the first 3 phases of the uncleared margin rule, they hold the vast majority both of the in-scope, and the legacy outstanding notional.

**Table 2: Scheduled Expiration of Legacy Swap Notional by Time Period**

Asset Class	Expiration Period***	Legacy Notional*	% of Legacy**
CDS	Pre-Phase-5	251,008	18%
	2020-2025	855,547	61%
	Post-2025	294,172	21%
<b>CDS Legacy Total</b>		<b>1,400,726</b>	<b>100%</b>
FX	Pre-Phase-5	8,415,911	89%
	2020-2025	956,191	10%
	Post-2025	83,619	1%
<b>FX Legacy Total</b>		<b>9,455,721</b>	<b>100%</b>
IRS	Pre-Phase-5	7,741,062	28%
	2020-2025	10,793,316	40%
	Post-2025	8,704,874	32%
<b>IRS Legacy Total</b>		<b>27,239,252</b>	<b>100%</b>

\* Notional in Millions of USD

\*\* Percentages are based on total legacy notional for each asset class

\*\*\* Swaps with unknown maturities are included in the Post-2025 Totals

**Table 3: Total Legacy Notional by Industry**

Industry***	CDS		FX		IRS	
	Notional*	Rank**	Notional*	Rank**	Notional*	Rank**
Swap Dealer	1,400,726	1	9,455,721	1	27,239,252	1
Hedge Fund	333,006	3	2,259,970	2	6,038,415	2
Bank	58,773	6	1,964,118	3	3,112,859	3
Asset Manager	379,725	2	625,374	4	1,735,479	4
Pension Fund	93,554	5	179,299	7	1,391,191	5
Insurance	30,222	7	193,499	6	911,875	6
Unknown-Other	111,894	4	15,907	9	442,151	7
Corporate	****	****	225,349	5	300,767	8
Private Equity	29,625	8	38,868	8	201,062	9

\* Notional in Millions of USD

\*\* Rankings within each asset class

\*\*\* Industries sorted largest to smallest based on total notional in all asset classes

\*\*\*\* Data suppressed or aggregated to preserve counterparty confidentiality

Table 4 shows a breakdown of the floating rates for the various legacy swaps under the uncleared margin rule. Reference rate reform is underway globally and the International Swaps and Derivatives Association (ISDA) recently published an update on the effort's progress<sup>10</sup> to replace major interbank offered rates (IBORs) with alternate, more transaction based rates. Though an exact timeline remains unknown, banks on the Libor panel will no longer need to submit past 2021; because of this, it is expected that a significant portion of swaps that reference Libor will require amendments or replacements in the next few years.

The aggregate notional amount of legacy swaps referencing "IBOR" rates as a percent of the total cleared and uncleared market is around 7%, approximately \$20 trillion. If relief was not provided for reference rate adjustments, these swaps would fall under the uncleared margin requirements (or would when the appropriate Phase began, depending on counterparty).

**Table 4: IBOR-Referenced Swaps with Legacy Status Under the Uncleared Margin Rule**

Asset Class	IM Legacy Flag	Swap Phase	Reference Rate type	Gross Notional*	% of Uncleared**	% of Total***
IRS	In-Scope		IBOR	11,838,791	20%	4%
			Other	4,033,246	7%	1%
	Legacy	Phase 1-3	IBOR	7,614,816	13%	3%
			Other	2,817,120	5%	1%
		Phase 4	IBOR	3,887,935	7%	1%
			Other	1,442,307	2%	1%
		Phase 5	IBOR	7,936,813	14%	3%
			Other	3,540,260	6%	1%
	Out-of-Scope	Entity	IBOR	7,139,890	12%	3%
			Other	1,888,682	3%	1%
		Unknown	IBOR	3,928,467	7%	1%
			Other	1,898,922	3%	1%
<b>Total IRS</b>	<b>Uncleared Total</b>		<b>57,967,249</b>	<b>100%</b>	<b>21%</b>	
	<b>Cleared Total</b>		<b>220,850,650</b>	<b>--</b>	<b>79%</b>	
	<b>Cleared and Uncleared Total</b>		<b>278,817,899</b>	<b>--</b>	<b>100%</b>	

\* Notional in Millions of USD

\*\* Percentages are based on uncleared IRS total

\*\*\* Percentage of Total Cleared plus Uncleared Notional

Table 5 shifts from legacy swaps as determined by the UMR to legacy swaps as determined by the clearing requirement. The CFTC's clearing requirement was adopted in 2012, took effect in 2013, and was expanded further by a second clearing requirement determination in 2016. Both rules involved phased starts (see citation in data and methodology section above for specific dates and categories). The CFTC's 2012 rule required clearing of the most liquid CDS and IRS products and the 2016 rule expanded the list to include additional IRS products and currencies. As of April 2019, over 80% IRS and almost 60% of CDS index outstanding notional is cleared. As a result of the longer time since implementation, a much smaller proportion of swap notional (compared to the UMR) holds legacy status under the clearing mandate. In IRS, only 1% of all swap notional is legacy; in CDS, where the average holding period of a swap is shorter, an even smaller percentage of notional is legacy. Note that in the table no

<sup>10</sup> ISDA letter "Derivative contract robustness to risks of interest rate benchmark discontinuation" April 10, 2019. <https://www.isda.org/a/Y6SME/April-2019-Letter-to-FSB-OSSG.pdf>



distinction is made between voluntary and mandatory clearing. In contrast to the UMR rule, a relatively high proportion of CDS and IRS swaps are out-of-scope, primarily driven by the product involved, not the entity type<sup>11</sup>. The especially high proportion of CDS index swaps that fall out of scope (46%) is driven by non-standardized products like swaptions, index tranches, and indices not covered by the CFTC's clearing requirement.

**Table 5: Summary of Legacy Status Under the CFTC's Clearing Requirement**

Asset Class	Clearing Legacy	Out of Scope Category	Gross Notional*	% of Uncleared**	% of Total***
CDS Index	Cleared		1,864,097	n/a	42%
	Legacy		7,993	0%	0%
	Out-of-Scope	Entity	522,163	21%	12%
	Out-of-Scope	Product	2,007,504	79%	46%
<b>Total CDS Index</b>	<b>Uncleared Total</b>		<b>2,537,661</b>	<b>100%</b>	<b>58%</b>
	<b>Cleared Total</b>		<b>1,864,097</b>	--	<b>42%</b>
	<b>Cleared and Uncleared Total</b>		<b>4,401,758</b>	--	<b>100%</b>
IRS	Cleared		220,850,650	n/a	79%
	Legacy		4,083,368	7%	1%
	Out-of-Scope	Entity	8,377,672	14%	3%
	Out-of-Scope	Product	45,506,209	79%	16%
<b>Total IRS</b>	<b>Uncleared Total</b>		<b>57,967,249</b>	<b>100%</b>	<b>21%</b>
	<b>Cleared Total</b>		<b>220,850,650</b>	--	<b>79%</b>
	<b>Cleared and Uncleared Total</b>		<b>278,817,899</b>	--	<b>100%</b>

\* Notional in Millions of USD

\*\* Percentages are based on totals for each asset class

\*\*\* Percentage of Total Cleared plus Uncleared Notional

## CONCLUSION

This study examined the characteristics of swaps that hold legacy status under the CFTC's uncleared margin and clearing rules. The findings show a non-negligible amount of legacy swap notional outstanding under the uncleared margin rule, with a large percentage projected to fall into scope when phase 5 of the rule occurs. However, though legacy swaps represent a relatively high proportion of the uncleared swap universe, they often represent a much smaller proportion of the aggregated cleared and uncleared swap markets. In contrast, total swap notional representing legacy swaps under the clearing requirement is quite low, often only a few percentage points of the notional for each asset class. Separately, of the IRS legacy swaps under the UMR, over 70% may require amendments to address the planned cessation of LIBOR and other interbank offered rates, a transition which is currently underway.

<sup>11</sup> In order to perform the data analysis, out-of-scope swaps were identified first by product, then by counterparty type. Therefore, all swaps in the out-of-scope "entity" category are products referenced in the CFTC's clearing requirement, but involve one or more out-of-scope counterparty types.

## APPENDIX A

The tables below detail the legacy swap totals under the uncleared margin rule by major industry firm type. Industry groupings are identified by the S&P Ratings Sectors maintained by S&P Global, with additional augmentation from OCE staff. There are individual tables for the following industry classes: Asset Manager, Bank, Corporate, Hedge Fund, Insurance, Pension Fund, Private Equity, Swap Dealer, and Unknown-Other. The CFTC's swaps data shows both counterparties to every trade so these industry groupings are over-inclusive. For example, the table for asset managers totals all trades with an asset manager on either side – this is true for all industries.

There are a relatively small number of trades where a given firm type is on both sides of a trade (i.e., an asset manager facing another asset manager); these trades are counted only once while the rest are counted twice. In addition, some asset classes or cells within industries have been suppressed to preserve counterparty confidentiality. Therefore, the total from all of these tables is slightly less than twice the total uncleared notional reported in Table 1.

Industry	Asset Class	IM Legacy Flag	Swap Phase	Gross Notional*	% of Notional**
Asset Manager	CDS Index	In-Scope		10,746	2%
		Legacy	Phase 1-3	8,238	1%
			Phase 4	78,163	14%
			Phase 5	293,324	52%
		Out-of-Scope	Entity	141,986	25%
			Unknown	30,038	5%
	<b>Total CDS Index</b>			<b>562,496</b>	<b>100%</b>
	FX	In-Scope		47,298	1%
		Legacy	Phase 1-3	2,555	0%
			Phase 4	98,569	2%
			Phase 5	524,249	11%
		Out-of-Scope	Entity	316,917	6%
			Product	3,831,755	77%
	Unknown	123,018	2%		
	<b>Total FX</b>			<b>4,944,360</b>	<b>100%</b>
	IRS	In-Scope		55,611	2%
		Legacy	Phase 1-3	26,805	1%
			Phase 4	422,941	16%
			Phase 5	1,285,733	48%
Out-of-Scope		Entity	614,043	23%	
		Unknown	267,193	10%	
<b>Total IRS</b>			<b>2,672,326</b>	<b>100%</b>	

\* Millions of USD (Uncleared Only); \*\* Percentages based on Asset Class totals by Industry

Industry	Asset Class	IM Legacy Flag	Swap Phase	Gross Notional*	% of Notional**
Bank	CDS Index	In-Scope		7,710	5%
		Legacy	Phase 1-3	10,077	7%
			Phase 4	4,396	3%
			Phase 5	44,300	29%
		Out-of-Scope	Entity	66,894	44%
			Unknown	18,502	12%
	<b>Total CDS Index</b>			<b>151,879</b>	<b>100%</b>
	FX	In-Scope		491,099	8%
		Legacy	Phase 1-3	21,479	0%
			Phase 4	364,566	6%
			Phase 5	1,578,073	25%
		Out-of-Scope	Entity	198,935	3%
			Product	3,383,557	53%
	Unknown		334,527	5%	
	<b>Total FX</b>			<b>6,372,236</b>	<b>100%</b>
	IRS	In-Scope		631,830	9%
		Legacy	Phase 1-3	472,114	7%
			Phase 4	661,145	10%
			Phase 5	1,979,599	29%
		Out-of-Scope	Entity	2,021,113	29%
Unknown			1,146,548	17%	
<b>Total IRS</b>			<b>6,912,351</b>	<b>100%</b>	

\* Millions of USD (Uncleared Only); \*\* Percentages based on Asset Class totals by Industry

Industry	Asset Class	IM Legacy Flag	Swap Phase	Gross Notional*	% of Notional**	
Corporate	CDS Index				***	
	<b>Total CDS Index</b>			<b>15,613</b>	<b>100%</b>	
	FX	In-Scope			2,100	0%
		Legacy***	Phase 1-5		225,349	9%
			Entity		522,660	21%
		Out-of-Scope	Product		1,632,362	65%
			Unknown		148,251	6%
	<b>Total FX</b>			<b>2,530,721</b>	<b>100%</b>	
	IRS	In-Scope		***	***	***
		Legacy***	Phase 1-5		300,767	13%
			Entity		1,921,519	81%
Out-of-Scope		Unknown		155,924	7%	
<b>Total IRS</b>			<b>2,378,210</b>	<b>100%</b>		

\* Millions of USD (Uncleared Only);

\*\* Percentages based on Asset Class totals by Industry

\*\*\* Data suppressed or aggregated to preserve counterparty confidentiality

Industry	Asset Class	IM Legacy Flag	Swap Phase	Gross Notional*	% of Notional**
Hedge Fund	CDS Index	In-Scope		18,585	4%
		Legacy***	Phase 1-5	2,259,970	23%
		Out-of-Scope	Entity	104,939	22%
			Unknown	19,333	4%
	<b>Total CDS Index</b>			<b>475,862</b>	<b>100%</b>
	FX	In-Scope		38,316	0%
		Legacy***	Phase 1-5	2,259,970	23%
		Out-of-Scope	Entity	557,749	6%
			Product	6,544,726	66%
			Unknown	493,611	5%
	<b>Total FX</b>			<b>9,894,373</b>	<b>100%</b>
	IRS	In-Scope		2,622,715	21%
		Legacy	Phase 1-3	19,832	0%
			Phase 4	1,419,583	11%
			Phase 5	4,598,999	36%
Out-of-Scope		Entity	1,949,899	15%	
		Unknown	2,061,444	16%	
<b>Total IRS</b>			<b>12,672,474</b>	<b>100%</b>	

\* Millions of USD (Uncleared Only);

\*\* Percentages based on Asset Class totals by Industry

\*\*\* Data suppressed or aggregated to preserve counterparty confidentiality

Industry	Asset Class	IM Legacy Flag	Swap Phase	Gross Notional*	% of Notional**	
Insurance	CDS Index	In-Scope		0	0%	
		Legacy***	Phase 1-5	30,222	66%	
		Out-of-Scope	Entity	4,901	11%	
			Unknown	10,481	23%	
	<b>Total CDS Index</b>			<b>45,604</b>	<b>100%</b>	
	FX	In-Scope	***		***	***
		Legacy***	Phase 1-5	193,499	25%	
		Out-of-Scope	Entity	39,859	5%	
			Product	507,487	64%	
			Unknown	46,289	6%	
	<b>Total FX</b>			<b>787,135</b>	<b>100%</b>	
	IRS	In-Scope	***		***	***
		Legacy***	Phase 1-5	911,875	73%	
Out-of-Scope		Entity	173,492	14%		
		Unknown	159,027	13%		
<b>Total IRS</b>			<b>1,244,393</b>	<b>100%</b>		

\* Millions of USD (Uncleared Only);

\*\* Percentages based on Asset Class totals by Industry

\*\*\* Data suppressed or aggregated to preserve counterparty confidentiality

Industry	Asset Class	IM Legacy Flag	Swap Phase	Gross Notional*	% of Notional**
Pension Fund	CDS Index	In-Scope		3,718	3%
		Legacy***	Phase 1-5	93,554	72%
		Out-of-Scope	Entity	23,507	18%
			Unknown	9,059	7%
	<b>Total CDS Index</b>			<b>129,838</b>	<b>100%</b>
	FX	In-Scope		5,660	0%
		Legacy***	Phase 1-5	179,299	13%
		Out-of-Scope	Entity	41,216	3%
			Product	1,115,317	81%
			Unknown	35,270	3%
	<b>Total FX</b>			<b>1,376,763</b>	<b>100%</b>
	IRS	In-Scope		15,486	1%
		Legacy***	Phase 1-5	1,391,191	65%
		Out-of-Scope	Entity	363,454	17%
			Unknown	358,238	17%
<b>Total IRS</b>			<b>2,128,369</b>	<b>100%</b>	

\* Millions of USD (Uncleared Only);

\*\* Percentages based on Asset Class totals by Industry

\*\*\* Data suppressed or aggregated to preserve counterparty confidentiality

Industry	Asset Class	IM Legacy Flag	Swap Phase	Gross Notional*	% of Notional**
Private Equity	CDS Index	In-Scope	***	***	***
		Legacy***	Phase 1-5	29,625	73%
		Out-of-Scope	Entity	9,218	23%
			Unknown	1,730	4%
	<b>Total CDS Index</b>			<b>40,574</b>	<b>100%</b>
	FX	In-Scope		3,958	1%
		Legacy***	Phase 1-5	38,868	6%
		Out-of-Scope	Entity	25,696	4%
			Product	580,859	88%
			Unknown	11,334	2%
	<b>Total FX</b>			<b>660,714</b>	<b>100%</b>
	IRS	In-Scope	***	***	***
		Legacy***	Phase 1-5	201,062	73%
Out-of-Scope		Entity	63,735	23%	
		Unknown	9,584	3%	
<b>Total IRS</b>			<b>274,382</b>	<b>100%</b>	

\* Millions of USD (Uncleared Only);

\*\* Percentages based on Asset Class totals by Industry

\*\*\* Data suppressed or aggregated to preserve counterparty confidentiality

Industry	Asset Class	IM Legacy Flag	Swap Phase	Gross Notional*	% of Notional**
Swap Dealer	CDS Index	In-Scope		513,675	21%
		Legacy	Phase 1-3	362,232	15%
			Phase 4	131,096	5%
			Phase 5	907,398	37%
			Entity	299,156	12%
		Out-of-Scope	Unknown	253,647	10%
			<b>Total CDS Index</b>		<b>2,467,205</b>
	FX	In-Scope		10,487,176	19%
		Legacy	Phase 1-3	500,866	1%
			Phase 4	3,655,977	7%
			Phase 5	5,298,879	9%
		Out-of-Scope	Entity	1,846,711	3%
			Product	32,343,582	58%
			Unknown	1,753,195	3%
	<b>Total FX</b>		<b>55,886,386</b>	<b>100%</b>	
	IRS	In-Scope		15,872,037	28%
		Legacy	Phase 1-3	10,431,937	18%
			Phase 4	5,330,242	9%
			Phase 5	11,477,073	20%
Out-of-Scope		Entity	8,425,894	15%	
		Unknown	5,827,388	10%	
<b>Total IRS</b>		<b>57,364,572</b>	<b>100%</b>		

\* Millions of USD (Uncleared Only); \*\* Percentages based on Asset Class totals by Industry

Industry	Asset Class	IM Legacy Flag	Swap Phase	Gross Notional*	% of Notional**
Unknown-Other	CDS Index	In-Scope		11,254	3%
		Legacy	Phase 1-3	8,307	2%
			Phase 4	241	0%
			Phase 5	103,346	29%
			Entity	67,981	19%
		Out-of-Scope	Unknown	159,353	45%
			<b>Total CDS Index</b>		<b>350,482</b>
	FX	In-Scope		4,197	0%
		Legacy***	Phase 1-5	15,907	1%
		Out-of-Scope	Entity	221,982	10%
			Product	1,630,705	75%
			Unknown	312,519	14%
	<b>Total FX</b>		<b>2,185,309</b>	<b>100%</b>	
	IRS	In-Scope		2,921	0%
		Legacy	Phase 1-3	13,311	0%
Phase 4			14,508	0%	
Phase 5			414,332	10%	
Out-of-Scope		Entity	2,384,086	58%	
		Unknown	1,259,794	31%	
<b>Total IRS</b>		<b>4,088,952</b>	<b>100%</b>		

\* Millions of USD (Uncleared Only);

\*\* Percentages based on Asset Class totals by Industry

\*\*\* Data suppressed or aggregated to preserve counterparty confidentiality

## APPENDIX B

Table B1 summarizes legacy swaps that could be impacted by Brexit as the swaps have one counterparty in the U.S. and one in the Great Britain. As mentioned in the introduction, the UK and U.S. have an agreement to maintain continuity of derivatives trading and clearing post-Brexit. While it is unlikely any issues will arise with the agreement, Brexit is an evolving situation and these estimates are provided for contextual purposes. The CFTC's data primarily covers the U.S. swaps market so the authors could not estimate the size of the swaps market with counterparties in the UK and EU countries.

**Table B1. Legacy Swaps under the Uncleared Margin Rule Between US and UK Counterparties**

Asset Class	IM Legacy Flag	Swap Phase	US Brexit	Gross Notional*	% of Uncleared**	% of Total***
CDS	In-Scope			513,675	20%	12%
	Legacy	Phase 1-3	US-GB	134,442	5%	3%
			Other	227,790	9%	5%
		Phase 4	US-GB	21,201	1%	0%
			Other	109,896	4%	2%
		Phase 5	US-GB	98,461	4%	2%
			Other	808,937	32%	18%
	Out-of-Scope	Entity		364,686	14%	8%
		Unknown		258,574	10%	6%
	Total CDS Index	<b>Uncleared Total</b>			<b>2,537,661</b>	<b>100%</b>
<b>Cleared Total</b>			<b>1,864,097</b>	--	<b>42%</b>	
<b>Cleared and Uncleared Total</b>			<b>4,401,758</b>	--	<b>100%</b>	
FX	In-Scope			10,487,176	19%	18%
	Legacy	Phase 1-3	US-GB	88,206	0%	0%
			Other	412,660	1%	1%
		Phase 4	US-GB	390,191	1%	1%
			Other	3,265,786	6%	6%
		Phase 5	US-GB	266,874	0%	0%
			Other	5,032,005	9%	9%
	Out-of-Scope	Entity		1,903,701	3%	3%
		Product		32,705,306	58%	57%
		Unknown		1,753,195	3%	3%
Total FX	<b>Uncleared Total</b>			<b>56,305,100</b>	<b>100%</b>	<b>98%</b>
	<b>Cleared Total</b>			<b>1,117,379</b>	--	<b>2%</b>
	<b>Cleared and Uncleared Total</b>			<b>57,422,479</b>	--	<b>100%</b>
IRS	In-Scope			15,872,037	27%	6%
	Legacy	Phase 1-3	US-GB	2,356,878	4%	1%
			Other	8,075,059	14%	3%
		Phase 4	US-GB	376,956	1%	0%
			Other	4,953,286	9%	2%
		Phase 5	US-GB	747,896	1%	0%
			Other	10,729,177	19%	4%
	Out-of-Scope	Entity		9,028,572	16%	3%
Unknown			5,827,388	10%	2%	
Total IRS	<b>Uncleared Total</b>			<b>57,967,249</b>	<b>100%</b>	<b>21%</b>
	<b>Cleared Total</b>			<b>220,850,650</b>	--	<b>79%</b>
	<b>Cleared and Uncleared Total</b>			<b>278,817,899</b>	--	<b>100%</b>

\* Notional in Millions of USD; \*\* Percentages are based on totals for each asset class

\*\*\* Percentage of Total Cleared plus Uncleared Notional

## APPENDIX C

Appendix C is an addendum to Table 4 in the main paper and shows the total number of swaps projected to be impacted by the uncleared margin rule. The swap counts show the number of unique, open swap positions that fall in each category as of the reference date. The percentages are based on the total uncleared swap count, which includes swaps determined to be out of scope of the uncleared margin rule.

**Table C1: IBOR-Referenced Swaps with Legacy Status Under the Uncleared Margin Rule**

Asset Class	IM Legacy Flag	Swap Phase	Reference Rate Type	Gross Notional*	Swap Count**	% of Total Swap Count***
IRS	In-Scope		IBOR	11,838,791	58,849	8%
			Other	4,033,246	42,081	5%
	Legacy	Phase 1-3	IBOR	7,614,816	100,464	13%
			Other	2,817,120	77,062	10%
		Phase 4	IBOR	3,887,935	52,802	7%
			Other	1,442,307	32,051	4%
		Phase 5	IBOR	7,936,813	99,185	13%
			Other	3,540,260	42,934	5%
	Out-of-Scope	Entity	IBOR	7,139,890	162,616	21%
			Other	1,888,682	38,796	5%
		Unknown	IBOR	3,928,467	49,722	6%
			Other	1,898,922	26,791	3%
<b>Uncleared Total</b>				<b>57,967,249</b>	<b>783,353</b>	<b>100%</b>

\* Notional in Millions of USD

\*\* Count of total unique, uncleared swap positions

\*\*\* Percentages are based on total count of uncleared IRS Swaps



## APPENDIX D

One ongoing discussion regarding the current and future status of legacy swaps focuses on the set of swaps potentially affected by benchmark transition. Because of market integrity concerns with some commonly-used rate benchmarks, like Libor, market participants and regulators have agreed to engage in a universal effort to move away from contracts referencing benchmarks which are phasing out and to new, robust benchmarks like the Secured Overnight Financing Rate (SOFR) in the United States. In many cases, derivatives contracts which reference Libor or Libor-like benchmarks are currently considered legacy under both the margin and clearing mandates. Without relief, after a transition such as Libor to SOFR, these derivatives contracts would no longer hold legacy status and, though there is no SOFR clearing mandate, could be faced with uncleared IM requirements.

The below table provides a high-level summary of the current set of legacy IBOR-based uncleared swaps.<sup>12</sup> The first row of the table provides a notional and ENNs summary of the set of IBOR swaps where both counterparties are SDs. The remaining rows summarize the set of SD/non-SD uncleared IBOR swaps. On an ENNs basis, these two subsets are roughly similar in size, with uncleared SD/SD IBOR swaps representing around \$2.2tn of ENNs (both long and short) and uncleared SD/non-SD representing around \$2.5tn of ENNs.

Without relief, once these derivatives are shifted from IBORs to their replacements, initial margin would need to be posted for the counterparties that are at that point phased in (likely a significant subset, depending on transition timing). In order to estimate the amount of IM that might be needed, given this requirement, we make use of the standardized grid method; this method is commonly used by counterparty pairs that cannot, or choose not to, use the Standard Initial Margin Model (SIMM). The standardized IM grid approach assigns a 2 percent margin requirement on rate swaps with durations between 2 and 5 years.<sup>13</sup> Using this multiplier, the IM requirement on all covered SD/non-SD swaps would fall around  $2\% * (\$2.46\text{tn} + \$2.49\text{tn})$  or roughly \$100bn. This estimate is of course dependent on a number of assumptions and could over- or under-estimate the actual margin requirement in a number of ways, including:

- A significant fraction of swap portfolios may use the SIMM methodology to calculate IM requirements, a methodology which commonly requires less, sometimes substantially less, than the requirements when based on the grid.
- For portfolios which do use the grid method, swaps with durations above 5 years would be assigned a 4% multiplier, double that used in the estimate (in contrast, swaps with durations below 2 years would be assigned a 1% multiplier). More generally, the above estimate assumes that all swaps in the portfolio have a 5 year duration, which ignores potential curve risks.

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<sup>12</sup> The swaps in this category are deemed legacy due to either: 1) being initiated prior to the dates of the margin and clearing requirements or 2) one or both counterparties are not yet phased into the IM requirements.

<sup>13</sup> We use this multiplier because the ENNs calculation duration adjusts all swap exposures to a 5-year swap equivalent.

- The above estimate assumes that no IM is currently being posted voluntarily. Any margin that is already being exchanged, even absent a mandate, would lower the marginal cost of IM posting assuming legacy status is lost.

With those (and potentially other) caveats, we provide the below table as a way to inform both regulators and market participants about a subset of legacy swaps of strong current interest.

**Open Interest for Uncleared IBOR Swaps for SD/SD (top line) and SD/Non-SD (remaining) as of 9/13/19 (\$mns)**

<b>Participant Type</b>	<b>Long Notional</b>	<b>Short Notional</b>	<b>Long Adj. Not.</b>	<b>Short Adj. Not.</b>	<b>Long ENNs</b>	<b>Short ENNs</b>
SD/SD	10,363,983	10,363,983	7,534,588	7,534,588	2,219,419	2,219,419
ASSET MANAGER	565,968	492,737	401,059	410,806	178,346	188,092
BANK	523,511	662,270	470,055	748,345	207,051	485,342
GOVT/QUASI-GOVT	512,495	364,546	315,911	404,935	162,541	251,565
HEDGE FUND	2,978,990	2,128,228	935,176	697,999	521,257	284,080
INSURANCE	290,694	221,008	517,970	314,984	321,285	118,299
NONFINANCIAL	205,000	702,654	190,246	688,189	162,478	660,421
OTHER FINANCIAL	493,594	479,804	591,302	385,564	371,607	165,869
PENSION	586,662	448,546	1,043,231	742,800	493,762	193,331
UNCLASSIFIED	94,216	207,728	68,721	170,824	43,008	145,111
<b>TOTAL (non-SD)</b>	<b>6,251,130</b>	<b>5,707,521</b>	<b>4,533,671</b>	<b>4,564,446</b>	<b>2,461,335</b>	<b>2,492,110</b>