



The Demand for Central Clearing: To Clear or Not to Clear, That is the Question!

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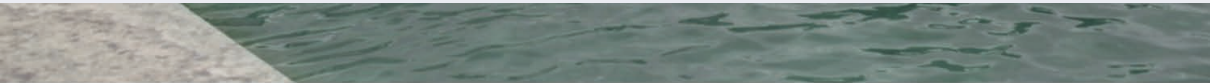
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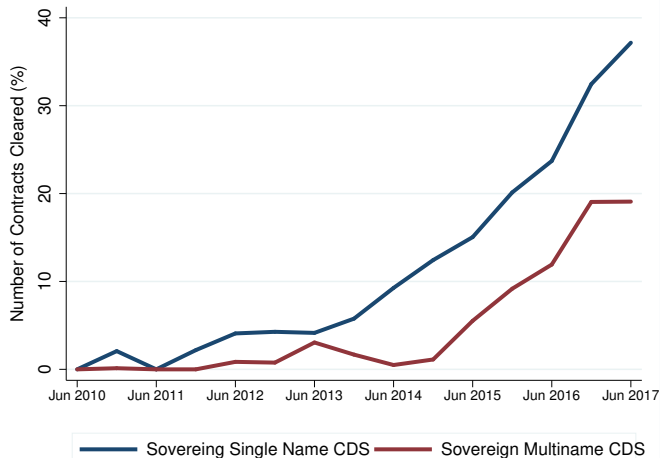
Central clearing of derivatives is a primary objective of the global financial reform effort after the financial crisis.

*"All standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest.// OTC derivative contracts should be reported to trade repositories. Non-centrally cleared contracts should be subject to higher capital requirements.
(G-20 Meeting Pittsburgh, September 2009)"*

- ▶ A CCP is an entity that is "in the middle", i.e. interposes itself between the counterparties of a trade, acting as *a seller to the buyer* and *a buyer to the seller*.
- ▶ This substitution is legally called **novation**
- ▶ When a trade is "novated", the CCP becomes the legal counterparties to the trade.
- ▶ This process requires standardization
- ▶ The CCP ensure the financial performance (physical settlement of the contract)
- ▶ If one of the party defaults, the CCP steps in.



- ▶ The U.S. Congress enacted the Dodd-Frank Wall Street Reform and Consumer Protection Act (DFA) into law in July 2010; the European Parliament and the Council of Ministers agreed to the European Market and Infrastructure Regulation (EMIR) in August 2012.
- ▶ While CDS indices must already be cleared, **single names CDS clearing is still voluntary** to these days.
- ▶ From BIS reports we could deduct that the number of contracts actually being cleared continues to be a relatively small fraction of total notional activity.



- ▶ Do the post-crisis regulatory reforms developed by global standard-setting bodies create appropriate incentives for different types of market participants to centrally clear OTC derivatives contracts?
- ▶ What is the state of art?
- ▶ Why CDS traders choose to clear certain trades, but not others?

- ▶ The CDS market is highly concentrated and interconnected, and could serve as a transmission channel of systemic risk in the event of a counterparty failure
- ▶ G20 Pittsburgh summit (2009) response: OTC derivatives contracts should be cleared through CCP.

Basel III framework:

- ▶ Banks' collateral and mark-to-market exposures to the central counterparties are subject to a lower risk weights...
- ▶ ...but the default fund exposure to the CCP is subject to capital requirements.
- ▶ In addition, from January 2017, the regulation requires to exchange initial and variation margins for non-centrally cleared derivatives exposures.

$$\text{Margins} = f \{RE_i, Q_i, CCR_j, CCP\}$$

Where RE_i indicates the characteristics of the reference entity, Q_i represents the size or volume of the transaction, CCR_j the counterparty credit risk, and CCP whether the transaction is centrally cleared or not.

$$\text{Expected Loss}_j = f \{RE_i, Q_i, CCR_j, K_{CMi}, CCP\}$$

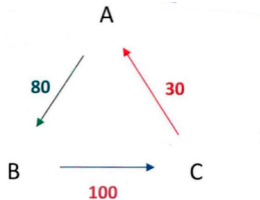
where CCR_j is counterparty credit risk associated with OTC derivatives, K_{CMi} the capital requirement on the default fund contribution of member i (See Bank for International Settlements, 2012), and CCP indicates whether the transaction is centrally cleared or not.

Centrally Cleared Transactions

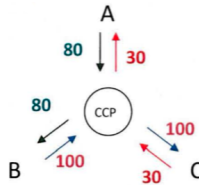
With the CCP \Rightarrow Expected Losses \downarrow but Margin Costs \uparrow

Margin Reduction and Netting opportunities:

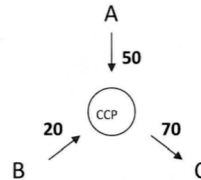
- ▶ Bilateral case: possible only for the open contracts between two counterparties
- ▶ Multilateral case (CCP): possibility of netting/cancellation of offsetting contracts at CCP level (Multilateral netting), and may not require full collateralization



Bilateral model



CCP without netting



CCP with netting

- ▶ **Duffie and Zhu (2011)**: central clearing for a single asset class could limit netting efficiencies increasing collateral demand and counterparty exposures. Need for single non-specialized CCP
- ▶ **Cont and Kokholm (2014)**: multi-asset class central clearing reduce interdealer exposures, but a single non-specialized clearing house can pose systemic risk issues.
- ▶ **Duffie et al. (2015)**: collateral demand does not increase with mandatory central clearing.
- ▶ **Getmanky-Kubitza-P (2018)**: In presence of correlation across and within derivative classes (i.e., systematic risk), only with a significant (very large) number of counterparties central clearing dominates bilateral clearing for a market participant perspective. Two other important elements are: collateralization of derivative claims, and 3) loss sharing among clearing members.
- ▶ **Ghamami and Glasserman (2017)**: three main drivers to centrally clear a transaction when there is no clearing obligation: (i) netting efficiency across asset classes; (ii) margin period of risk, i.e., the time between the counterparty's default and the closing of position; (iii) size of the clearing members' contribution to the default fund.

Hypothesis 1 Willingness to clear is larger when the counterparty credit risk is larger.

Drivers:

- ▶ **Margin Costs** are related to the stand-alone creditworthiness of the counterparty, if she is riskier the margin cost would be higher (CCR_j);
- ▶ **CCR capital requirements** have the opposite effect on the incentives to clear: the reduction of capital requirements is larger in case of central clearing of contracts with counterparty that are very risky.

Hypothesis 2: Willingness to clear is larger if the contract is less liquid, has a large size and the reference entity is more risky

Drivers:

- ▶ **Margin Costs** are related to the riskiness of the reference entity and the size of the contract. If the *reference entity is riskier* or the *size of the contract is larger*, margin costs would be higher for CCP;
- ▶ **Margin Costs and Liquidity:** more liquid contracts face lower margin requirements by the CCP. But an increase in the number of daily transactions could be due to large sovereign credit risk shock, i.e. increase in volatility (e.g. Brexit)
- ▶ **CCR:** the capital reduction costs might prevail with respect to margin costs and transparency, and are proportional to the riskiness of the contract (RE_i , Q_i , CCR_j)

Hypothesis 3: Willingness to clear is larger if the transaction helps to manage margins, i.e. it decreases the amount of collateral to be posted because it reduces the exposure to the CCP.

Drivers:

- ▶ **Margin Costs** are proportional to the exposure with the CCP and depends on (i) the net positions with the transacting counterparty and (ii) the net position with the CCP.
- ▶ **CCP Risk Management Practices:** a dealer would choose to clear a contract when the overall collateral commitment is smaller, that usually happens when the net exposure is overall reduced.

- ▶ The Database is provided by the European Systemic Risk Board (ESRB) and ruled by EMIR
- ▶ CDS contracts having as a reference entity **Italy, France, and Germany**
- ▶ Trade Repository is DTCC
- ▶ New contracts for the year **2016**
- ▶ **We restrict the empirical analysis only on transactions where the buyers or the sellers are European**
- ▶ According to the average data provided by DTCC on TIW (Trade Information Warehouse), in the last quarter of 2016, the Italian CDS is the 5th most traded, the French is the 20th, Germany is the 54th.

- Gross and net notional amount traded in our sample by market participants for the year 2016.
- *Other Institutions* includes Insurances, Pension, and Non financial organizations. The category *Other* refers to all the others not classifiable institutions

Market Participants	Gross Notional Amount (B\$)	Gross Notional Amount (%)	Net Notional Amount (B\$)	Number of Counterparties
Banks	95.8	12.0%	5.5	33
Dealers	596.6	74.8%	3.7	15
Funds	95.01	11.9%	-7.2	233
Other Inst.	7.7	1.0%	-2.1	40
Others	2.6	0.3%	0.0	123

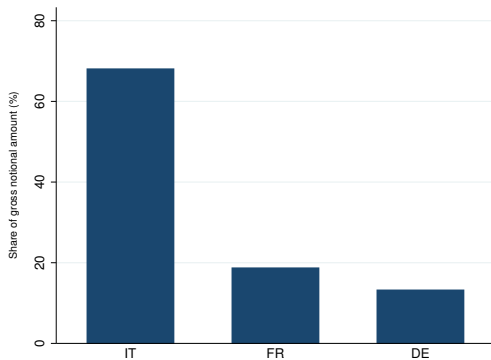
Source: EMIR data from European Systemic Risk Board (ESRB)

- ▶ Clearing members: largest 16 dealers* plus other banks (tot. 26)
- ▶ Non-Clearing members (CR): members subject to capital requirements (banks and insurances)
- ▶ Non-Clearing members (NCR): members not subject to capital requirements (all the others)

Market Participants	Gross Notional Amount (B\$)	Gross Notional Amount (%)	Net Notional Amount (B\$)	Number of Counterparties
Clearing Members	769.1	96.5%	9.7	26
Non-Clearing Members (CR)	8.5	1.1%	-2.2	29
Non-Clearing Members (NCR)	17.1	2.1%	-8.1	266

Source: EMIR data from European Systemic Risk Board (ESRB)

* Bank of America, Barclays, BNP Paribas, Citigroup, Crédit Agricole, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JPMorgan Chase, Morgan Stanley, Nomura, Royal Bank of Scotland, Société Générale, UBS, and Wells Fargo.

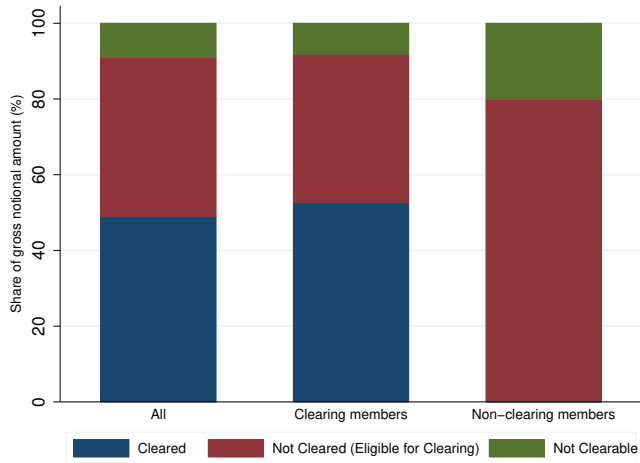


Gross notional amount traded by reference entity

Source: EMIR data from European Systemic Risk Board (ESRB)

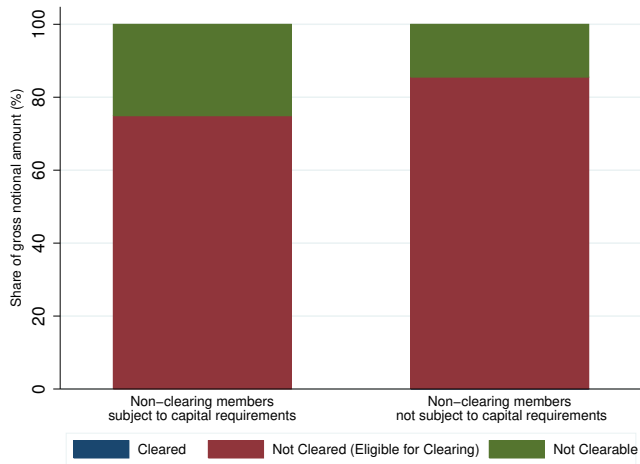
Three type of contracts:

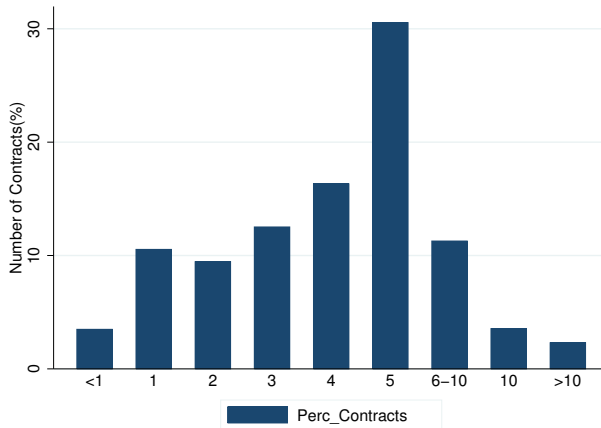
- ▶ **Not clearable Contracts:** they do not not satisfy certain CCP clearing criteria (tenor greater 10 years, not in Euro currency, ISIN not accepted), therefore the counterparties are forced to make only bilateral contracts;
- ▶ **Not cleared but eligible for clearing contracts:** although they satisfy the clearing criteria, they are not cleared by the counterparties;
- ▶ **Cleared contracts:** Contracts that are cleared by the counterparties.



Why a contract is not eligible for clearing?

- ▶ The contract is Euro (89.21%)
- ▶ The tenor is greater than 10 years (10.41%)
- ▶ ISIN is not accepted by the clearing house for a specific reference entity (0.38%).





82% of the contracts have tenor less or equal than 5 years

In order to formally test our hypotheses, we estimate the following probit regressions separately for each sovereign CDS reference entity k (Italy, Germany, and France):

$$Pr(Y_{t,k} = 1) = \alpha_0 + \beta \times X_{t,k} + \epsilon_{t,k} \quad (1)$$

where $Y_{t,k}$ is equal to one if the transaction on the reference entity k has been centrally cleared, and zero otherwise

The matrix X contains a set of control variables, different for each Hypothesis tested, as well as a month fixed effect.

Hypothesis 1: What are the drivers of the decision to clear?

Hypothesis 1 Willingness to clear is larger when the counterparty risk is larger.

Panel C HP 1 : Counterparty Credit Risk

Variable	Description	Data source
Spread Buyer EU - 5Y	Buyer CDS spread with Tenor 5 years	Markit
Spread Seller EU - 5Y	Seller CDS spread with Tenor 5 years	Markit
Correlation with Ref Entity CDS	Correlation between Clearing Member CDS and Reference Entity CDS	Markit

Hypothesis 1 Clearance is larger when the counterparty risk is larger.

Panel A			
Variables	DE	FR	IT
Spread Seller EU - 5Y	0.026	0.019	0.012
Observations	591	1,047	3,152
Adj R2	0.170	0.146	0.090
Panel B			
Variables	DE	FR	IT
Spread Buyer EU - 5Y	-	-	0.001
Observations			1,954
Adj R2			0.0355
Month FE			Y

Red $p < 0.01$, Blue $p < 0.05$, Green $p < 0.1$

Hypothesis 1 Clearance is larger when the counterparty risk is larger - Correlation between Clearing Member CDS and Reference Entity CDS (no Wrong Way Risk)

Panel A			
Variables	DE	FR	IT
Spread Seller EU - 5Y	0.013	0.016	0.008
Correlation with Ref Entity CDS	0.494	-0.015	0.246
Observations	581	1,008	3,034
Adj R2	0.051	0.076	0.033
Panel B			
Variables	DE	FR	IT
Spread Buyer EU - 5Y	-	-	0.001
Correlation with Ref Entity CDS			-0.168
Observations			1,876
Adj R2			0.0012
Month FE	N	N	N

Red $p < 0.01$, Blue $p < 0.05$, Green $p < 0.1$

Hypothesis 2:

What are the drivers of the decision to clear?

Hypothesis 2: Clearance is larger if the contract is more liquid and when the reference entity is relatively safe.

Panel A Hypothesis 2: Contract and Liquidity Risk

Variable	Description	Data source
N. of Trades	Daily trades: Number of daily trades of a particular reference entity	EMIR
Log Notional Amount	Trade Volume : The logarithm of the contracts' notional amount	EMIR
CDS Volatility	Exponential Weighted Moving Average Volatility of the CDS spread Market	Markit
CDS Quote Spread	CDS Quote Spread of a particular reference entity	Markit
Δ CDS Spread	CDS Spread of a particular reference entity change	Markit
Spread Buyer EU - 5Y	Buyer CDS spread with Tenor 5 years	Markit
Spread Seller EU - 5Y	Seller CDS spread with Tenor 5 years	Markit

Hypothesis 2: Willingness to clear is larger if the contract is less liquid, has a large size and the reference entity is more risky

	DE		FR		IT	
Variables	(1)	(2)	(3)	(4)	(5)	(6)
CDS Quote Spread	-0.007	-0.0074	0.009	0.012	0.002	0.005
Delta CDS_Spread	-0.039	-0.107	-0.181	-0.197	0.005	0.018
CDS Volatility	-13.64	-37.350	-14.780	-6.551	15.090	7.917
Log Notional Amount	-0.002	-0.001	0.174	0.182	0.181	0.239
N. of Trades	-0.002	-0.001	-0.002	-0.001	0.001	0.005
Spread Seller EU - 5Y	0.0123	0.0229	0.017	0.022	0.008	0.017
Spread Buyer EU - 5Y					0.004	0.014
Observations	481	481	911	911	2,354	2,354
Adj R2	0.0593	0.190	0.186	0.225	0.0956	0.329
Month FE	N	Y	N	Y	N	Y

Robust standard errors in parentheses: Red $p < 0.01$, Blue $p < 0.05$, Green $p < 0.1$

Hypothesis 3:

What are the drivers of the decision to clear?

Hypothesis 3 : Willingness to clear is larger if the transaction helps to manage margins, i.e. it decreases the amount of collateral to be posted because it reduces the exposure to the CCP.

- The net position with the CCP is defined as:

$$Position_wt_CCP_{ijt} = \frac{Net_Not_wt_CCP_{ijt}}{G_Bought_Not_Cl_{ijt} + G_Sold_Not_Cl_{ijt}}. \quad (2)$$

Position with the CCP		
Variable	Description	Data Source
Seller is net buyer with US CCP (Dummy)	Net buyer for US CCP sells protection: Trades where the Seller is a net buyer	EMIR
Seller is net buyer with EU CCP (Dummy)	Net buyer for EU CCP sells protection: Trades where the Seller is a net buyer	EMIR
Spread Seller EU - 5Y	Seller CDS spread with Tenor 5 years	Markit

Hypothesis 3 :Clearance is larger if the transaction helps to manage margins, i.e. reduces the amount of collateral to be posted because it makes flatter the exposure to the CCP

Panel A			
Variables	DE	FR	IT
Seller is net buyer with A CCP (Dummy)	2.722	0.508	0.933
Seller is net buyer with B CCP (Dummy)			1.197
CDS Spread Seller	0.015	0.019	0.012
Observations	590	1,036	3,152
Adj R2	0.213	0.148	0.106
Month FE	Y	Y	Y

Red $p < 0.01$, Blue $p < 0.05$, Green $p < 0.1$

- ▶ The large majority of the transaction cleared are **between CCP clearing members**
- ▶ **Counterparty credit risk** is an important incentive to clear a contract
- ▶ Even after controlling for CCR
 - ▶ **Exposure** is an important incentive to clear a contract as well
 - ▶ **Both capital costs (CCR)** and **margin costs** are relevant for the decision to clear with some differences among the three sovereign:
 - ▶ Italy: counterparty credit risk exposure is more relevant than the margin costs
 - ▶ Germany: margin costs are the most important
 - ▶ France: no conclusive results
- ▶ **Positions with the CCP** matter on the decision to clear the single contracts, largely from the **seller** perspective.

- ▶ Almost **no evidence** of clearance of transactions by **non-clearing members**, independently whether they are subject to capital requirements
- ▶ Factors are not the same for all analyzed CDS reference entities
- ▶ Decision to clear is also related to net exposure with the CCP, in addition to the characteristics of the contract and the counterparty credit risk
- ▶ The regulators should carefully consider:
 - ▶ netting benefits (rather than focusing on margin and capital requirements incentives for cleared transactions?)
 - ▶ contribution to default fund

Thank you very much for your attention!



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