Master Thesis

International Business Law

SAFETY OF CENTRAL COUNTERPARTIES: A CRITICAL ANALYSIS TO OVERCOME THE REGULATORY GAPS

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1. Introduction

The global financial crisis (GFC) of 2008 damaged the foundations of the financial system to the center. Financial derivatives are considered as the main reason of the GFC or one of the most disruptive factors by many academics.

Financial derivatives intended to spread risks throughout the financial markets. Over-the-counter (OTC) derivatives worsened the Financial Crisis. For example, AIG suffered huge amounts losses because of its derivatives transactions. They only sold credit default swaps (CDS) rather than doing both-sided. After the underlying assets of CDSs defaulted, the counterparties of AIG started to demand more collateral.[1] This situation effected liquidity needs and credit ratings of AIG. The collapse and near-failure of AIG was a major issue in the GFC.[2]

Before the GFC derivatives usually were trading off-exchange with low transparency for market players. Price opacity decreased the efficiency of the market because of the situation of end users. The opacity of the OTC derivatives also made the market more complex and raised systemic risk. It made harder to determine how the risk is concentrated and to find solutions while the collapse begins.[3]

The risk of contagion raised because derivatives market made the largest financial firms more interconnected. When counterparties faced counterparty risk, they claimed more collateral and the counterparty became more fragile as is the same in AIG example. All the derivatives dealers affected each other with this kind of calls and made the financial system weaker.[4]

This opaque web of bilateral OTC derivatives deals was intensified among the top dealers which were bilaterally connected to each other. Margin and collateral provisions were not enough to protect the financial system. Large companies traded these instruments to reduce their exposures to the mortgage market. However, they exposed

[1] Michael S. Barr Howell E. Jackson Margaret E. Tahyar, Financial Regulation: Law and Policy (Foundation Press 2016) 1074
[2] Robert McDonald and Anna Paulson, 'What went wrong at AIG' [2015] Kellogg School of management at Northwestern University https://insight.kellogg.northwestern.edu/article/what-went-wrong-at-aig accessed '10 April 2018'
[3] Michael S. Barr Howell E. Jackson Margaret E. Tahyar, Financial Regulation: Law and Policy (Foundation Press 2016) 1074
[4] Ibid

themselves to the risk that led their counterparties to fail and these counterparties were exposed the same risks.[5]

After the GFC, some global actors, mainly group of 20 (G20) considered and applied a few precautions which would improve the financial system and increase the transparency in the OTC derivatives market. The main objectives of the global regulations include trading of all OTC derivatives on an exchange or other electronic platform, clearing of all standardized OTC derivatives through a central counterparty, reduction of counterparty risk, and increase of transparency of the derivatives market.[6]

Mandatory clearing of all standardized OTC derivatives contracts through central counterparties is one of the precautions.[7] It is said that

> *"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."*[8]

A central clearing counterparty (CCP) is an entity that interposes itself between the two counterparties in a financial transaction.[9] The aim of a CCP is to manage counterparty credit risk and liquidity risk. When a bilateral trade is conducted by a CCP, the main transaction is taken over by two identical contracts between the CCP and each of the counterparties. So, participants in centrally cleared markets are not directly exposed to credit or liquidity risks.[10]

However, if a clearing member defaults, the CCP must continue to meet its obligations to its surviving participants. The CCP may suffer due to the changes in the

[5] Ibid
[6] KPMG G-20 OTC Derivatives Regulation 2014
[7] G20's Global Derivatives Transparency Mandate (DTCC, 2015)
[8] EUR-Lex - 52009DC0563 https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52009DC0563&from=en accessed '18 April 2018'
[9] Dietrich Domanski, Leonardo Gambacorta, Cristina Picillo, 'Central clearing: trends and current issues' [2015] Bank for International Settlements
[10] Louise Carter and Duke Cole, 'Central Counterparty Margin Frameworks' [2017] Reserve Bank of Australia Bulletin

situation of the parties. Therefore, CCPs keep prefunded financial resources in the form of margin and a default fund.[11]

Even though the purpose of CCPs is to reduce the systemic risk they create other risks. The most important one is that it concentrates counterparty credit risks of its members in itself. Liquidity risk can be given as an example of other risks due to nature of margining.[12] Therefore, counterparty and other kind of risks will be concentrated in CCPs which makes themselves potential threats to the whole financial system.[13]

These institutions are too big to fail, because they centralize a huge amount of counterparty credit risk. A top US Federal Researcher Richard Berner explains the issue as "*There are several advantages to (clearing houses) but it's important to know ... that using (clearing houses) doesn't reduce risk; indeed it concentrates risk*."[14] Stephen J. Lubben supports the given idea as *''given the vital place of clearinghouses in Dodd-Frank, it is perhaps surprising that Dodd-Frank makes no provision for the failure of a clearinghouse.''*[15]

The Europe Union is concerned as well, while European Central Bank states that there are several gaps after Pittsburg meeting and they must be studied. Resilience of CCPs and ease at recovery and resolution procedures among the mentioned gaps.[16]

Nevertheless, top research groups point out the issue. David Skeel of Brookings Institute stated there is no regulation in case of failure of a clearinghouse in the US Law as he describes the gap as *"may be the single greatest weakness of the new financial architecture."*[17]

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[11] Ibid

[12] Jon Gregory, *Central Counterparties : Mandatory Central Clearing and Initial Margin Requirements for OTC Derivatives* (John Wiley & Sons, Incorporated, 2014)

[13] ICMA Group, What does a CCP do? https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/repo-and-collateral-markets/icma-ercc-publications/frequently-asked-questions-on-repo/27-what-does-a-ccp-do-what-are-the-pros-and-cons/ accessed '8 April 2018'

[14] Douwe Miedema, 'Clearing Houses Are Big Risk, Top U.S. Federal Researcher Says' [May 15, 2015] Reuters https://www.reuters.com/article/us-regulation-summit-berner/clearing-houses-are-big-risk-top-u-s-federal-researcher-says-idUSKBN0O024O20150515 accessed '25 May 2018'

[15] Stephen J. Lubben, 'Failure of the Clearinghouse: Dodd-franks Fatal Flaw? [2015] Virginia Law & Business Review https://ssrn.com/abstract=2652011 accessed '18 April 2018'

[16] European Central Bank Economic Bulletin Issue 8/2016

[17] David Skeel, 'What if a clearinghouse fails?' [2017] Brookings Institute https://www.brookings.edu/research/what-if-a-clearinghouse-fails accessed '20 April 2018'

International organizations noticed weakness of the current provision as well. An IMF working paper 'Central Counterparties Resolution –An Unresolved Problem' states *"Resolution, in a case of closure, could be focused on the reduction of systemic shock and the smooth operation of the financial system—but (to give an example) there are no provisions in the EU's draft Regulation directed to that end."*[18]

Central clearing counterparties should not be allowed to default. Even if they default there must be some failure measures. These issues will be conducted by national and international financial regulations. There are regulations about safety and stability of central clearing counterparties. However, improved regulations must be replaced with weak ones and certain regulatory gaps must be fulfilled.

This thesis features regulatory aspects of the United States and the European Union mainly. The GFC sparked in the US because of failures or near-failures of AIG and Lehman-Brothers. It affected mostly American and European businesses and individuals. Therefore, needs for new regulations were realized firstly in those countries. Also, world's biggest derivative dealer companies such as JPMorgan Chase and Deutsche Bank are in those countries.

The US and the EU central counterparties started to grow because of mandatory clearing for exchanged and non-exchange derivatives transactions. Their regulations and supervisions are conducted by the Dodd-Frank Act in the US and by the European Market Infrastructure Regulations (EMIR) in the EU. The EMIR is a "regulation" in the European Law and it applies directly all the members. Therefore, this study does not focus on regulations of certain member countries of the EU.

However, there are some regulatory gaps in those regulations due to newness of such regulations. Also, there is no practical damage so far, because none of the central counterparties faced with serious default threat after the GFC. This thesis mainly examines the case when a central counterparty faces with failure threat and how this danger can be alleviated with some certain tools. Thus, this study has the following research question: how to overcome the regulatory gaps of central counterparties in order to avoid future financial crisis like the GFC?

[18] Manmohan Singh and Dermot Turing, 'Central Counterparties Resolution – An Unresolved Problem' [2018] IMF Working Paper WP/18/65

In order to solve the research question, the first chapter of the thesis brings an overview of derivatives market and related clearing process. It is important especially in law studies because many practitioners have not adequate knowledge about advanced financial instruments. Also, first chapter shows how systemic risk occurs because of OTC derivatives and is mitigated by central clearing counterparties. These risk measures are the first step to understand why central counterparties must be robust.

The second chapter discusses benefits and costs of mandatory central clearing. It emphasizes the most obvious disadvantage which is concentrated counterparty risk. This disadvantage is the main reason why such regulatory gaps must be covered.

The third chapter is basically explanation of current regulatory framework about clearinghouses in the US and in the EU. Those are the selected legal systems because of their relevance to the issue. Additionally it describes the global principles for financial market infrastructures that the Bank for International Settlements has provided.

The final chapter analyzes failure precautions step by step. In general, danger starts when a clearing member defaults. The first treatment is called default-waterfall process. If it does not cover the loss, the second step which is recovery process must be held. Recovery tools include extraordinary measures such contract tear-ups. If the loss cannot be covered after recovery process, thirdly resolution plans can be triggered. Resolution is an ultimate procedure which includes official authority interventions. For the final analysis of this thesis, literature review and a comparative legal approach were used as methodology.

2. What are Derivatives Markets and Central Clearing?

Law practitioners are familiar with basics of finance and related law fields such as bankruptcy law. However, when it comes to financial derivatives lawyers have little knowledge about them. Analyze and evaluation of the main question that is safety of central clearing counterparty require at least basic level financial derivatives knowledge. Because central clearing counterparties at the heart of the derivatives market. Therefore, firstly basics of derivatives markets will be analyzed in this chapter. Then the issue about how derivatives create systemic risk will be explained. The final part of this chapter is a description about clearing counterparties.

2.1 Derivatives Market

Even finance theorists cannot explain what derivatives are properly[19] it is crucial to analyze the derivatives market to resolve related issues such as safety of central clearing counterparties as it is our main question. Central clearing counterparties are at the center of derivatives market and stand between numerous deals. Firstly, basics of derivatives markets will be analyzed. Then using purposes of derivatives will be explained which are basically hedging, arbitrage and speculation. After that the practical types of derivatives will be mentioned. Those are futures, options and swaps. Besides them credit derivatives will be analyzed deeply because they are the riskiest kind of these instruments and very suitable topic for central clearing.

2.1.1 Basic concepts of Derivatives

Joanna Benjamin (2007) describes a derivatives contract as:

> *A derivatives contract is a bilateral contract (i) under which the right and obligations of the parties derived from, or defined by reference to, a specified asset type, entity or benchmark; and (ii) the performance of which*

[19] Lynn A. Stout, 'Derivatives and the Legal Origin of the 2008 Credit Crisis' [2011] Harvard Business Law Review, Vol. 1, pp. 1-38, 2011; UCLA School of Law, Law-Econ Research Paper No. 11-11. Available at SSRN: https://ssrn.com/abstract=1874806 accessed '13 April 2018'
Also See, e.g., RICHARD A. BREALEY & STEWART C. MYERS, PRINCIPLES OF CORPORATE FINANCE 398–99 (6th ed. 2000).

is agreed to take place on a date significantly later than the date on which the contract is concluded.[20]

Derivatives activity is broadly divided into three market sectors: derivatives exchanges, over-the-counter derivatives and structured products.[21] Derivatives exchanges facilitate the centralized trading of derivatives in standard form.[22] These markets provide transparency, ease at regulation, managing the risk of member default and provide clearing and settlement facilities.[23]

Parties agree upon the term of the trades privately in over-the-counter (OTC) markets.[24] They are decentralized markets that makes the market participants have limited knowledge in market prices and trade volumes.[25] Most derivatives business takes place in the OTC markets.[26] Clearing is increasingly available in OTC markets for standardized contracts.[27] Over-the-counter derivatives markets are complex and opaque.[28]

Derivatives are also widely traded in the primary securities markets.[29] Derivatives may themselves be issued in the form of investment securities or may be embedded within familiar forms of investment securities (structured product).[30]

A derivatives contract may be settled by the delivery of the reference assets (physically).[31] However, in most cases this does not place. Instead, the parties agree that the contract should be 'cash settled'. This means that, on the settlement date, the seller pays, or receives, the difference between contract price and the market price of the underlying asset.[32]

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[20] Joanna Benjamin, *Financial Law* (Oxford University Press, 2007) 65
[21] Ibid 70
[22] Ibid
[23] Ibid 70
[24] Darrell Duffie, *Dark Markets: Asset Pricing and Information Transmission in Over-the-Counter Markets* (Princeton University Press, 2011)
[25] Ibid
[26] Joanna Benjamin, *Financial Law* (Oxford University Press, 2007) 71
[27] Ibid 71
[28] FSB Reports on Reforms to OTC Derivatives Markets [2017] Financial Stability Board http://www.fsb.org/2017/06/fsb-reports-on-reforms-to-otc-derivatives-markets/ accessed '25 May 2018'
[29] Joanna Benjamin, *Financial Law* (Oxford University Press, 2007) 71
[30] Ibid 71
[31] Ibid
[32] Ibid 72

2.1.2 Using Purposes

Derivatives can be used for many purposes. The main ones are hedging to mitigate markets risk, speculation to make profit and arbitrage to make profit in other way.

Hedging provides protection against losses that come from changes in market conditions such as interest rates, currencies.[33] Hedging is a defensive position.[34] It transfers risks away from the contract buyer to the institution is willing to bear it for a certain price.[35] Derivatives contracts were originally developed for the purpose of hedging but now comply more with other position types.[36]

In contrast to hedging, speculators behave without any commercial interest in the underlying entity, benchmark or asset.[37] They try to make profits by reading the market as to changes in future market situations.[38] Some authors[39] criticize possible effects of speculation as the casino capitalism.[40] Derivatives are extensively used for speculation and are well suited to it because they are highly geared in themselves.[41]

Arbitrage means difference trading.[42] There is no interest in the reference asset either like speculation.[43] The arbitrageur analyses pairs of markets which are economically linked to identify whether there is price difference.[44] Arbitrage involves staking short positions by the forward sale of assets not held by the arbitrageur at the time of sale.[45] It can be done with a derivative transaction.[46]

Synthetic is the term given to financial instruments that are created artificially by simulating other instruments with different cash flow patterns. They are created in the form of a contract.[47] Synthetic may be refrained from transaction costs, regulatory

[33] Ibid
[34] Ibid
[35] Ibid 87
[36] Ibid 87
[37] Ibid
[38] Ibid 88
[39] Michael Barratt Brown, Fair Trade from Keynes The General Theory 1936
[40] Ibid
[41] Joanna Benjamin, *Financial Law* (Oxford University Press, 2007) 88
[42] Ibid
[43] Ibid
[44] Ibid
[45] Ibid
[46] Ibid
[47] Ibid 89

regimes, illiquidity or legal problems.[48] Derivatives are well suited to establish synthetic positions while other financial positions are not.[49]

2.1.3 Types in the Practical World

There are three basic types of derivatives.[50] These are futures, options and swaps. A future contract is an agreement to buy or sell a specified quantity of a specified type of asset at a specified future date for a specified price.[51] Future contracts[52] are as considered as forwards if they not traded on exchanges.[53] Exchanges standardize contract terms to promote liquidity and reduce the transaction costs associated with finding a counterparty.[54] In futures market terminology the buyer of the contract is in the long position and the seller is in the short position.[55]

An option contract grants the option holder the right but not the obligation to buy or sell.[56] An option to buy an asset is called as a call option and an option to sell an asset is called as a put option.[57] The buyer of a call is called is in a long position, the seller is called is in a short position.[58] Typical options are European and American ones.[59] In a European-style option the underlying asset can be bought or sold only on the day the specified day.[60] In American-style option the underlying asset can be bought or sold always during the period.[61] Options can be traded on exchanges or OTC markets.[62]

A swap is an OTC agreement between two entities to exchange cash flows in the future the swap agreement specifies the dates when the cash flows should be paid and

[48] Joanna Benjamin, *Financial Law* (Oxford University Press, 2007) 89
[49] Ibid
[50] Joanna Benjamin argues there are two in Financial Law (Oxford University Press, 2007) Some scholars argue swaps are another type of derivatives
[51] Ibid
[52] Future contracts are forward contracts if they are traded on over-the-counter markets. Joanna Benjamin, *Financial Law* (Oxford University Press, 2007)
[53] Joanna Benjamin, *Financial Law* (Oxford University Press, 2007) 66
[54] Alan N. Rechtschaffen, *Capital Markets, Derivatives and The Law Second Edition* (Oxford University Press, 2014) 154
[55] Lawrence S. Ritter, William L. Silber, Gregory F. Udell, *Principles of Money, Banking & Financial Markets* (12th Edition, Pearson International Edition, 2009)
[56] Joanna Benjamin, *Financial Law* (Oxford University Press, 2007) 66
[57] Ibid
[58] Ibid
[59] Ibid
[60] Ibid
[61] Ibid
[62] Ibid

how they should be calculated.[63] Typically the cash flow calculation is based on a future value of an interest rate, foreign exchange rate, stock or commodity price.[64] The swap contracts usually have cash flow payments on multiple future dates.[65] Some of the most important and common types are specified below. Interest rate swap are one of them and Jonna Benjamin defines them as:

> *"An agreement between two parties by which each agrees to pay the other on a specified date or dates an amount calculated by reference to the interest which would have accrued over a given period on a notional principal sum*."[66]

In interest rate swaps, the two sides of the transaction pay different rates.[67] One rate is usually fixed and remains the same: the other one is floating rate based on a volatile interest rate such as the twelve-month London Inter-Bank Offered Rate (LIBOR).[68]

Credit derivatives are the most important derivatives because of their role in the financial system and they are well described by Moorad Choundhry (2011) as:

> *"Credit derivatives are financial contracts designed to reduce or eliminate credit risk exposure by providing insurance against losses suffered due to credit event. A payout under a credit derivative is triggered by a credit event associated with the credit derivative's reference asset or reference entity. "*[69]

Credit derivatives can be seen as a number of different structures due to their great flexibility in the legal form to achieve the same financial purpose.[70] There are three basic types of credit derivatives: the total return swap, the credit spread and the credit default swap.[71] Further some credit derivatives can be entrenched into notes or warrants.[72]

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[63] John C. Hull, *Options, Futures and Other Derivatives* (Ninth Edition, Pearson Education Limited, 2015) 152
[64] Ibid
[65] Ibid
[66] Joanna Benjamin, *Financial Law* (Oxford University Press, 2007) 67
[67] Ibid
[68] Ibid
[69] Moorad Choudhry*, Structured Credit Products: Credit Derivatives and Synthetic Securitisation* (John Wiley & Sons, Incorporated, 2011) 60
[70] Allen & Overy Instructions to Robin Potts, QC, Credit Derivatives, 19 May 1997
[71] Ibid
[72] Ibid

A credit default swap (CDS) is the most common form of credit derivative.[73] Moorad Choundhry (2011) describes credit default swaps as:

> *"A CDS is a bilateral contract that provides protection on the par value of a specified reference asset, with a protection buyer that pays a periodic fixed fee or a one-off premium to a protection seller, in return for which the seller will make a payment on the occurrence of a specified credit event."*[74]

The fee of the protection buyer is usually quarterly nominal values which are called basis point multipliers. The CDS can be subject to a single asset (underlying asset), multiple assets or a reference entity.[75] The obligation of the protection seller in a default scenario is up to the protection buyer or parties of the deal. The main feature of the credit default swap is that it transfers the credit counterparty risk of the protection buyer to the protection seller.[76] Banks may use credit default swaps in a different way. They can trade sovereign and corporate spreads by not using the actual credit default swaps. If a bank goes long a credit default swap it will make profit when it sells the CDS in a scenario that default probability of the underlying asset increases. It is because the price of protection goes up as the reference asset becomes riskier to hold.[77]

Besides credit default swaps, synthetic derivatives is a vital issue as well.[78] The use of credit derivatives to create synthetic securitization transactions is an important innovation. "*Credit derivatives are widely used in an important form of synthetic securitization known as Collateralized Debt Obligations (CDOs)".*[79]

A bundle of notes that have interest according to their performance on the underlying assets is called a cash flow CDO.[80] They are considered collaterals for the issued notes because of their names. Usually CDOs are structured as multi-tranche overlying notes which rated by one or more public credit rating agencies.[81] The highest rated ones are the ones most senior and they have priority to be paid. Synthetic

[73] Joanna Benjamin, *Financial Law* (Oxford University Press, 2007) 67
[74] Moorad Choudhry, *Structured Credit Products: Credit Derivatives and Synthetic Securitisation* (John Wiley & Sons, Incorporated, 2011) 69
[75] Ibid
[76] Ibid
[77] Ibid
[78] Joanna Benjamin, *Financial Law* (Oxford University Press, 2007) 79
[79] Ibid
[80] Moorad Choudhry, *Structured Credit Products: Credit Derivatives and Synthetic Securitisation* (John Wiley & Sons, Incorporated, 2011)
[81] Ibid

securitization structure is created due to the importance of credit risk transfer of the assets from the credit protection buyer itself to investors (protection sellers). Credit risk transfer is considered more important than funding considerations.[82]

2.2 Systemic Risk

Systemic risk can be defined as *"the risk of threats to financial stability that impair the functioning of a large part of the financial system with significant adverse effects on the broader economy".*[83] The financial system is banks, financial intermediaries, financial markets and their payment systems and any kind of event can create a systemic risk in this system.[84] However their reasons are mostly inappropriate policies including the GCF of 2008 as Lynn A. Stout states

> *"it was a dramatic, if underappreciated, change in the fundamental legal infrastructure underlying the derivatives markets—in particular, the sudden removal of centuries-old restraints on derivatives speculation outside an organized exchange—that most directly and proximately caused the 2008 credit crisis."*[85]

This thesis focuses the part of the clearinghouses in the financial system. It analyses their legal infrastructure. The situation before GFC must be showed to understand the regulations properly.

Counterparty credit risks were divided among the banks and other financial institutions before the GFC in a world without mandatory clearing. Briefly in the financial system all the institutions create a network of assets and liabilities through various contracts against each other. [86] In the perfect system all the firms fulfill their responsibilities with their adequate liquidity. Also, they use derivatives to take some positions (e.g. hedging, speculation) as noted above because of liquidity concerns. This

[82] Ibid
[83] Xavier Freixas et al., *Systemic Risk, Crises, and Macroprudential Regulation* (MIT Press, 2015)
[84] Ibid
[85] Lynn A. Stout, 'Derivatives and the Legal Origin of the 2008 Credit Crisis' [2011] Harvard Business Law Review, Vol. 1, pp. 1-38, 2011; UCLA School of Law, Law-Econ Research Paper No. 11-11. Available at SSRN: https://ssrn.com/abstract=1874806 accessed '17 April 2018'
[86] Xavier Freixas, *Systemic Risk, Crises and Macroprudential Regulation* (MIT Press, 2015)

network creates *'contagion' which refers to a "domino effect" that a failure of a bank has on other banks and financial intermediaries*[87] between financial institutions.[88]

The OTC derivatives market is a potential threat for the financial system because if a large financial institution fails it can start default in their counterparties.[89] Its counterparties effect their own derivatives contract parties. These losses grow like a snowball and it will be a disaster for the financial system.[90]

From the perspective of financial institutions, they concern about systemic risk however they need to manage their counterparty and other risks.[91] Doing bilateral netting and collateral agreements are the standard for derivatives deals and they decrease systemic risk significantly. CCPs make these agreements more efficient as will be mentioned later.[92]

In the GFC, CDS contracts created a network of counterparty risks. This network caused contagion among the suspects of the GFC. If a bank goes bankrupt in contagion their counterparts suffer due to their losses.[93] If these losses are huge enough they may cause the counterparties' bankruptcy. In 2008 this kind of issue happened. American International Group (AIG) was involved many CDS contracts and its failure led to many financial firms to go bankrupt.[94]

2.3 Central Clearing

Clearinghouses were existing before the GFC but they were using differently.[95] The Chicago Board of Trade set a clearinghouse up in 1883 which decreased the netting and margin costs as a contract performer.[96] However, it was not providing a guarantee. There were some clearinghouses that serves as a guarantee in Europe around 1800. The Board

[87] Ibid
[88] Ibid
[89] John C. Hull, 'OTC Derivatives and Central Clearing: Can All Transactions Be Cleared?' [2010] https://www.moodys.com/microsites/crc2010/papers/hull_otc.pdf accessed '18 April 2018'
[90] Ibid
[91] Ibid
[92] Ibid
[93] Xavier Freixas, *Systemic Risk, Crises and Macroprudential Regulation* (MIT Press, 2015)
[94] Ibid
[95] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[96] Randall S. Kroszner, 'Can the Financial Markets Privately Regulate Risk? The Development of Derivatives Clearinghouses and Recent Over-the-Counter Innovations' [1999] Journal of Money, Credit and Banking, Vol. 31, No. 3

of Trade Clearing Corporation transformed into a clearing counterparty as it is known today.[97] It took so long because large financial firms did not want to let their competitors have the advantage of the credit strength. The Chicago Mercantile Exchange had a clearinghouse internally in 1919.[98]

A central counterparty intervenes between two parties of the original transaction.[99] The new structure contains two new transactions as it is described below in the Figure 1. These are the ones between the central clearing party and the seller and between the central clearing party and the buyer.[100] In the new structure the clearing counter party becomes the buyer of the original seller and becomes the seller of the original seller.[101] The main thing for the new structure is that the original counterparties are now exposed to the counterparty credit risk of the central clearing counterparty. On the other side the central clearing counterparty is exposed to the counterparty credit risk of the original parties.[102]

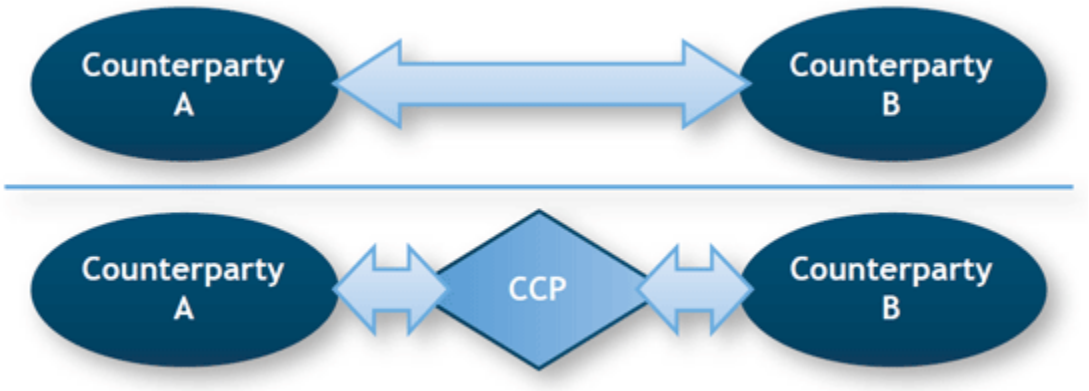

Figure 1 A central counterparty intervenes between two parties of the original transaction and creates two new transactions [103]

[97] Ibid
[98] Ibid
[99] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[100] Ibid
[101] Ibid
[102] Ibid
[103] Source: The Bull Run "What Is" A CCP https://thebullrun.wordpress.com/2012/07/03/what-is-a-ccp/ accessed '20 April 2018'

As Figure 2 shows Central clearing counterparties also provide its members "multilateral netting" facilitation.[104] The image on the left side of Figure 2 shows the condition before bilateral settlements. When firms A, B, C and D make bilateral settlements with each other (not altogether just between the agreements) they reshape the condition described on the middle image of Figure 2. When the CCPs gets involved in the system it interposes between parties. Therefore, the clearinghouse offset the payment obligations of multiple counterparties so the counterparties have to pay just the net payment obligations instead of their gross obligations. The payments will be done through the central counterparty[105] as it is displayed on the right side of Figure 2.

Multilateral netting decreases counterparty credit risk and liquidity risk.[106] When the required liquidity is 37 in the middle image before the multilateral netting, it drops to 16 after netting as it is shown in the right image. This netting makes better margin efficiencies. Also, it allows its members to exit their positions thanks to the offsetting trades. It creates a safer financial system and better price stability because it lowers the numbers of positions must be replaced if the CCP defaults. [107]

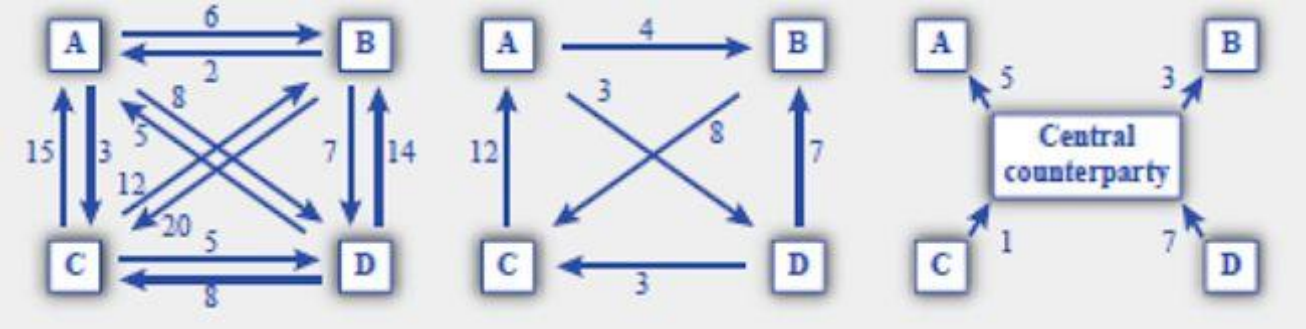

Figure 2: The left image shows very complex and risky financial environment while the market participants have obligations to each other. Bilateral settlements relieve this financial environment to some extent as it is shown at the middle image. When the central counterparty enters the financial system it takes a much simpler shape. If one of the participants defaults, the systemic risk would be alleviated easily because of its simple position in the system. Also, liquidity needs are much better as they are 16

[104] Bilateral Settlement and Multilateral Netting Source: Deutsche Bundesbank Oversight of payment and securities settlement systems https://www.bundesbank.de/Redaktion/EN/Dossier/Tasks/oversight.html?notFirst=true&docId=328228 accessed '20 April 2018'

[105] Ibid

[106] Ibid

[107] Ibid

units compared to 37 units before multilateral netting. This is how the CCP relieves counterparty and liquidity risks as the right image demonstrates.[108]

Derivatives market is a complex and opaque market. Over-the-counter transactions makes the market even less transparent. The market is being more dangerous because of credit derivatives. These financial instruments are not harmful at all. However, it must be treated carefully. Central clearing is one of the ways to mitigate risks with their multilateral netting facilities.

[108] Source: Bilateral Settlement and Multilateral Netting Source: Deutsche Bundesbank Oversight of payment and securities settlement systems https://www.bundesbank.de/Redaktion/EN/Dossier/Tasks/oversight.html?notFirst=true&docId=328228 accessed '20 April 2018'

3. Is Central Clearing Beneficial or Not?

Even if some clearinghouses failed in the past, they are considered very strong due to their risk management facilities.[109] They provide a lot of benefits to their members such as mitigating counterparty risk, multilateral netting, increased transparency, reduced transactions costs and transfer of defaulted members. However, central clearing counterparties bring some costs at the same time. Global fragmentation and moral hazards are examples for costs of mandatory central clearing.

3.1. Main Benefits

The parties of an OTC derivative contract are exposed to counterparty risk in two ways.[110] The first one is that it occurs because of the price of the underlying asset and the other one raises because of the possibility of default of its counterparty.[111] The amount of the risk increases as much as the amount of the deal increases. The main benefit of central clearing is the transfer of the credit risk from the parties to clearinghouses.[112] After the transfer, the CCP is able to facilitate multilateral netting. If the members offset their multiple obligations the CCP can reshape the different positions the between parties. Therefore the members have to pay only the netted amounts. This process decreases the overall amount of exposure of the CCP. When the amount of bilateral exposures are reduced, the financial system becomes safer.[113] Multilateral netting, also allows the parties to enter new deals and to terminate current transactions which provides lower the collateral costs.[114]

When a clearing member defaults its counterparties might default as well because of the domino-effect losses.[115] In these cases the default management process of the CCP

[109] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[110] Darrell Duffie et al., 'Policy Perspectives on OTC Derivatives Market Infrastructure' [2010] Fed. Reserve Bank of N.Y. , Staff Report No. 424
[111] Ibid
[112] Julia Lees Allen, 'Derivatives Clearinghouses and Systemic Risk: A Bankruptcy and Dodd-Frank Analysis' [2012] Stanford Law Review Issue 4
[113] Ibid
[114] Jon Gregory, *Central Counterparties: Mandatory Central Clearing and Initial Margin Requirements for OTC Derivatives* (John Wiley & Sons, Incorporated, 2014)
[115] Julia Lees Allen, 'Derivatives Clearinghouses and Systemic Risk: A Bankruptcy and Dodd-Frank Analysis' [2012] Stanford Law Review Issue 4

mitigates the effects of failure.[116] Also, with CCPs the market participants have to deal with less credit risk assessments.[117]

Clearinghouses makes financial markets more transparent in terms of prices.[118] It is because variation margins are based on mark-to-market prices. The margining and netting facilitations rise operational efficiency and lower costs.[119] It centralizes rules and mechanisms to reduce legal risks.[120] Multilateral netting makes the market better in terms of liquidity because it grants the participants easier deals.[121]

A CCP can look for activities of its members, thus it can measure how much risks they create. This danger would not be seen in bilateral market.[122] Also huge exposures can be done with margin multipliers and CCP can be aware of excessive ones. CCPs likewise improve standardization and competition in derivatives markets.[123]

Portability is one of the most important benefits of a CCP. If a clearing member defaults other clients are protected thanks to the ability of port trades to other clearing members.[124] Netting of the trades of a defaulted client also provides stability because these trades do not have to be closed out.[125]

Clearinghouses provide a well-managed default scenarios. A CCP does a central auction in a default situation. It means that the deals of the defaulting member are easily hedged, offset and replaced following a clearing member default.[126] It may appear as small price differences which are better than badly replaced positions. Netting again decreases the number of transactions and positions and it lowers the price impact.[127]

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[116] Ibid
[117] Jon Gregory, *Central Counterparties : Mandatory Central Clearing and Initial Margin Requirements for OTC Derivatives* (John Wiley & Sons, Incorporated, 2014)
[118] Jon Gregory, *Central Counterparties : Mandatory Central Clearing and Initial Margin Requirements for OTC Derivatives* (John Wiley & Sons, Incorporated, 2014)
[119] Ibid
[120] Ibid
[121] Ibid
[122] Ibid
[123] Ibid
[124] Ibid
[125] Ibid
[126] Ibid
[127] Ibid

3.2. Disadvantages and Costs for Market Participants

Even though central clearing counterparties provide many benefits using them has costs. CCPs can charge big amounts of initial margins and fees.[128] Additionally clearinghouses require default fund contributions and capital requirements from their members.[129] Recently increased margin requirements with liquidity issues, credit quality and other collaterals raise the costs significantly. Safer measures such as portability and segregation make such costs higher.[130]

Financial institutions can make netting facilitations with multiple CCPs, because there are more than one clearinghouse.[131] However, it causes some problems such as reduction in netting efficiencies.[132] Another problem that reduces clearing efficiency is global disintegration which means clearinghouses are stated in different jurisdictions.[133]

Margin requirements might change according to market conditions. If these changes are significant enough, they create impact on prices which constitute contagion.[134] Large banks do some CCP services already such as risk management, margining and legal support. Clearinghouses just repeat the same procedures in these situations which reduces efficiency.[135] Mandatory central clearing creates some specific rules such as margin requirements. These rules make tighter system. There may occur some operational problems in these systems.[136] Adverse selection about the products is another issue for CCPs.[137] The market participants know better the risk issues of their products than clearinghouses.[138]

[128] Ibid
[129] Ibid
[130] Ibid
[131] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[132] Ibid
[133] Ibid
[134] Jon Gregory, *Central Counterparties : Mandatory Central Clearing and Initial Margin Requirements for OTC Derivatives* (John Wiley & Sons, Incorporated, 2014)
[135] Ibid
[136] Ibid
[137] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[138] Craig Pirrong, 'The Economics of Central Clearing: Theory and Practice' [2011] ISDA

Clearinghouses create some moral hazards.[139] Firstly, clearing members might act reckless about their counterparty credit risk because it is being mitigated by the CCPs.[140] Even though this hazard face with some precautions such as initial margin, default fund there is always a risk that a member carries its risk from itself to the balance sheet of the CCP.[141] Secondly, clearing members might be careless about their risk management as much as the size of their clearinghouse.[142] Because as the CCP becomes more "too big to fail" diligence level of the members are likely to reduce.[143]

3.3. Systemic Risk in the New Structure

Before "the crisis amendments" counterparty credit risk of derivatives dealers was distributed among relatively smaller financial institutions. After the codified regulation, a single institution concentrates a huge amount of counterparty credit risk in itself.[144] However only two clearinghouses cleared about %60 of the cleared transactions according to Bank for International Settlements.[145] Likewise the most important central clearing counterparties have a small number of clients[146] as Bank for International Settlements state *"every systemically important bank participates in many CCPs, often in multiple jurisdictions…The large CCPs that clear most of the available over-the-counter (OTC) derivatives have a relatively small number of clearing members…"*[147]

The landscape of CCPs is extremely concentrated.[148] Systematically important CCPs are similar to monopolies.[149] If a problem occurs related to them it would affect the

[139] Paul Tucker, 'Are Clearing Houses the New Central Banks?' [2014] Federal Reserve Bank of Chicago Clearing Symposium
[140] Jon Gregory, *Central Counterparties : Mandatory Central Clearing and Initial Margin Requirements for OTC Derivatives* (John Wiley & Sons, Incorporated, 2014)
[141] Ibid
[142] Paul Tucker, 'Are Clearing Houses the New Central Banks?' [2014] Federal Reserve Bank of Chicago Clearing Symposium
[143] Ibid
[144] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[145] Dietrich Domanski, Leonardo Gambacorta, Cristina Picillo, 'Central clearing: trends and current issues' [2015] Bank for International Settlements
[146] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[147] Dietrich Domanski, Leonardo Gambacorta, Cristina Picillo, 'Central clearing: trends and current issues' [2015] Bank for International Settlements
[148] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[149] Ibid

financial markets.[150] The market can be the one where CCPs clear certain products or a wider financial market.[151] With these provisions the regulatory framework after the crisis might raise systemic risk in some ways.[152] After that another government bailout could be needed.[153]

One of the problems of the new regulatory framework is fragmentation of the clearing landscape.[154] The most ideal scenario is that there will be a single clearinghouse and it will operate globally to clear all OTC derivatives products.[155] It will have access to central bank liquidity in all related currencies.[156] However, this idea does not have any practical value because of political economy issues such as some countries want certain OTC derivatives be cleared in their own jurisdiction areas.[157] This legal fragmentation decreases efficiency of multilateral netting, brings more collateral requirements and needs regulatory coherence.[158]

Even tough central clearing counterparties gather systemic risk in itself, rest of the huge amount of risk stays within OTC derivatives dealer financial institutions.[159] Uncleared derivatives create an issue that can be explained as it separates netting facilitations and raises collateral amounts.[160] Also, important amount of counterparty credit risk stays in the bilateral markets.[161]

Another important thing is that financial institutions regarding risky bilateral transactions, are also members of more than one systematically important global CCPs.[162] This situation makes the financial environment more complex and systematically

[150] Ibid
[151] Ibid
[152] Ibid
[153] Ibid
[154] Ibid
[155] Manmonah Singh, 'Making OTC Derivatives Safe' [2011] IMF Working Papers http://www.imf.org/external/pubs/ft/wp/2011/wp1166.pdf accessed '21 May 2018'
[156] Ibid
[157] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[158] Ibid
[159] Ibid
[160] Manmohan Singh, 'New Regulations and Collateral Requirements – Implications for the OTC Derivatives Market Box 1 [2012,2013] Swift Institute Working Paper
[161] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] The Volcker Alliance Working Paper http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[162] Ibid

fragile.[163] This new framework is not significantly different from the old one[164] as economist Craig Pirrong points out:

> "*all major financial institutions will be interconnected via their linkages (direct and indirect) to CCPs. It is therefore profoundly incorrect to assert that clearing mandates reduce the interconnectedness of the financial system; these mandates reconfigure, but do not eliminate, interconnections between systemically important financial institutions ("SIFIs").*"[165]

Also, some CCP members supply specific services that increases interdependence of them and systemic connection.[166] Mark P. Wetjen of Commodity Futures Trading Commission gives an example about the problem as:

> "*Take, for example, a bank holding company with multiple material subsidiaries that are all active at a single CCP. One subsidiary could act as the CCP's primary custodian, another could be a clearing member with a large number of positions at the CCP, and a third could be part of a lender consortium that has agreed to provide the CCP with short-term funding in the event of a liquidity shortfall. If an idiosyncratic event threatens the stability of the bank holding company and its material subsidiaries, the CCP's operations and ability to meet its obligations could be severely impacted.*"[167]

Colleen M. Baker summarizes the new financial system as

> *"In sum, the clearing mandates have not only increased the concentration of credit risk within clearinghouses, but they have also intensified the global systemic connections among a small group of systemically important clearinghouses, banks, and financial institutions."*[168]

Before the regulatory amendments, the main issue regarding safety of the financial system was contagion among financial institutions. In this framework each financial

[163] Ibid
[164] Ibid
[165] Craig Pirrong, 'The Economics of Central Clearing: Theory and Practice' [2011] ISDA
[166] Clearinghouses for Over-the-Counter Derivatives Collen M. Baker November 2016 Working Paper The Volcker Alliance
[167] Mark P. Wetjen, CFTC Commissioner, 'Ensuring the Promise of a Centrally Cleared, Global Swaps Market: Next Steps, Remarks before the FIA' [Dec. 4, 2014] Derivative Conference
[168] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] The Volcker Alliance Working Paper http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf

institution has to be robust because a failure was affecting all the system. After the crisis amendments central counterparties have become significantly important in the new financial environment because of the amount of credit counterparty risk they concentrate in themselves. Contagion effect is disappeared but safety of central counterparties has become the new main issue. Therefore, this study focuses on safety measures and failure precautions related to central counterparties

3.4. Margining

Cross-margining arrangements is crucial source of interconnection between CCPs and their members.[169] Cross-margining applies where two sides have hedged positions against each other in separate markets.[170] Collateral of hedged position are being calculated as a single sum.[171] The rationale behind cross-margining agreements is to reduce clearing members' initial margin amount by doing an off-set on the portfolio.[172] Clearing members benefit from cost savings because of reduced margin requirements.[173] Cross-margining arrangements can be done where underlying assets are the same or different classes; where deals are made on an exchange trade or over-the-counter market: where clearinghouses are established in different jurisdictions; even where transactions are not cleared by a CCP.[174]

Even though cross-margining agreements decrease initial margin requirements and costs for market participants they raise systemic interconnection.[175] They make harder the default scenarios because they increase the complexity of margin models.[176] Clearinghouses select their own financial models which can be inaccurate.[177] Miscalculations when calculating initial margin requirements can be dangerous for a

[169] Ibid
[170] Peter Norman, *The Risk Controllers : Central Counterparty Clearing in Globalised Financial Markets* (John Wiley & Sons, Incorporated, 2011)
[171] Ibid
[172] Jon Gregory, *Central Counterparties : Mandatory Central Clearing and Initial Margin Requirements for OTC Derivatives* (John Wiley & Sons, Incorporated, 2014)
[173] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] The Volcker Alliance Working Paper http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[174] Jon Gregory, *Central Counterparties : Mandatory Central Clearing and Initial Margin Requirements for OTC Derivatives* (John Wiley & Sons, Incorporated, 2014)
[175] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] The Volcker Alliance Working Paper http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[176] Jon Gregory, *Central Counterparties : Mandatory Central Clearing and Initial Margin Requirements for OTC Derivatives* (John Wiley & Sons, Incorporated, 2014)
[177] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] The Volcker Alliance Working Paper http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf

CCP.[178] This threat gets bigger if the miscalculation occurs in a cross-margin situation.[179] The risk is that significant amount of losses in the financial resources of the CCP.[180] If these resources dry up the ability of the CCP to manage default situations diminishes.[181] It threats respectively the other members, the CCP and the financial market.[182]

Transparency of CCP margin models has been an issue as well.[183] Clearinghouses stand out against claims for additional transparency as they state that disclosure of these sensitive data could have effect market confidence and operations.[184] CCPs establish their margin calculation models on their own to calculate the initial margin requirements for their members.[185] Neither nationally nor globally there is no standardized regulatory approach to the calculation of initial margin among clearinghouses.[186] This deficiency can be issue in some ways.[187] Clearinghouses can compete with each other by using different margin requirements.[188] Pro-cyclicality of margin requirements is another source of market instability.[189] Pro-cyclicality can be described as decrease in margins because most CCPs are profit-based institutions and increase in margins due to chaos in the markets.[190]

Necessity of standardized margin models is a discussion at current policy.[191] Principle 6: Margin of the Principles for Financial Market Infrastructures states that *"A CCP should cover its credit exposures to its participants for all products through an effective margin system that is risk-based and regularly reviewed."*[192] Some policy makers

[178] Ibid
[179] Ibid
[180] Ibid
[181] Ibid
[182] Ibid
[183] Phillip Stafford, 'BoE Urges more transparency in clearing' [May 16, 2014] Financial Times https://www.ft.com/content/8fedeece-dcda-11e3-b73c-00144feabdc0 accessed accessed '3 May 2018'
[184] Ibid
[185] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] The Volcker Alliance Working Paper http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[186] Ibid
[187] Ibid
[188] Dietrich Domanski, Leonardo Gambacorta, Cristina Picillo, 'Central clearing: trends and current issues' [2015] Bank for International Settlements
[189] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] The Volcker Alliance Working Paper http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[190] Paul Tucker, 'Are Clearing Houses the New Central Banks?' [2014] Federal Reserve Bank of Chicago Clearing Symposium
[191] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] The Volcker Alliance Working Paper http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[192] Bank for International Settlements, Principles for financial market infrastructures: disclosure framework and assessment methodology (Dec. 2012), http://www.bis.org/cpmi/publ/d106.html accessed '3 May 2018'

suggest mandatory minimum margin requirements for CCPs.[193] Standardized margin model could be beneficial.[194] It improves transparency for regulators and market participants.[195] It also keeps clearinghouses from margin-based competition. However, mandatory standardized margin model is not completely beneficial.[196] It would make market participants look for any arbitrage opportunities which can cause imperfections.[197] It might also slow down market innovations related to margin models which decrease market efficiency.[198] Following only one way to determine a margin model is not more effective at all because central clearing counterparties clear various products with different in terms of riskiness, size, complexity, jurisdictions, the profile of dealers.[199]

Some argue it would be interesting if mostly identical global initial margin models apply while they differ according to conditions of their areas.[200] However a lot of international regulators must agree upon highly general rules.[201] Even if the regulators have some inconsistencies, the idea has a practical value.[202]

It can be concluded that central counterparties have brought many relieves to the financial system. Also, they provide some advantages to market participants as well. However, mandatory clearing has some disadvantages such as concentrated counterparty credit risk. Central clearing counterparties take precautions mainly collecting initial and variation margins to prevent possible disasters.

[193] Paul Tucker, 'Are Clearing Houses the New Central Banks?' [2014] Federal Reserve Bank of Chicago Clearing Symposium
[194] Collen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives November' [2016] The Volcker Alliance Working Paper http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf
[195] Ibid
[196] Ibid
[197] Ibid
[198] Ibid
[199] Ibid
[200] Ibid
[201] Ibid
[202] Ibid

4. Central Counterparty Regulations

The new financial system after the financial crisis of 2008 is explained in earlier chapters. This chapter is more about codified regulations. It aims to explain derivatives, clearing and central clearing counterparty regulations in the US, the EU. The EU regulations will be held continentally because the European Market Infrastructures Regulations which is the main regulation for derivatives and clearing counterparties in the EU is a "regulation" in the EU Law which applies throughout every member state.[203] Also, global provision especially "principles for financial market infrastructures" will be analyzed. The focus will be on safety of clearinghouses.

4.1. The U.S.

The U.S. regulators respond the G-20 undertakings by codified Title VII of Dodd-Frank.[204] It is a very complex framework about OTC derivatives market and its participants.[205] It separates OTC derivatives into two categories which are swaps and security-based swaps.[206] Swaps are mainly regulated by the Commodity Futures Trading Commission and security-based swaps are regulated by the Securities and Exchanges Commission.[207] These two institutions handle the responsibility together and codify mostly parallel rules.[208] Active market participants need to register to required institutions according to Title VII of Dodd-Frank.[209] It also foresees standardized OTC derivatives must be cleared, traded on an exchange platform and reported.[210] The main idea is to make more stable, more transparent and less complex financial market.[211]

The Dodd-Frank Act mandates swap dealers and major swap participants to register the CFTC or the SEC and brings some business conditions.[212] It obliges the CFTC

[203] European Market Infrastructure Regulation: What You Need to Know http://www.nortonrosefulbright.com/knowledge/publications/62449/european-market-infrastructure-regulation-what-you-need-to-know 'accessed 14 May 2018'
[204] Hester Pierce, 'Derivatives Clearinghouses: Clearing the Way to Failure' [2016] Cleveland State Law Review Vol 64:589
[205] Ibid
[206] Ibid
[207] Ibid
[208] Ibid
[209] Ibid
[210] Ibid
[211] Ibid
[212] Ibid

and SEC to determine which kind of OTC derivatives must be cleared.[213] The agencies must consider certain market conditions such as risk measures and liquidity.[214] Also, the Dodd-Frank requires that these swaps must be cleared through central clearing counterparties which are registered at the CFTC or SEC.[215] Title VII brings publicly transparent swap deals.[216] After that, the Act makes regulatory institutions to establish mandatory capital and margin requirements for cleared and uncleared swaps.[217]

Central clearing counterparties bring certain conditions such as financial situation or risk management capabilities that their members have to fulfill. Clearing members also need to have a bank account at one of the settlement banks of the CCP to meet given financial requirements. Central clearing counterparties follow the positions of their members up to avoid systemically risky situations. All the members of a CCP create a default fund by their contributions to cover the financial situation if a member defaults and its collateral is not enough. Each members' contribution depends on the risk level of the member.[218]

Even if a firm cannot meet the conditions to become a member or wants to avoid the costs it can or must (in a situation that clearing is mandatory) clear its deals through a CCP member. Most derivatives dealers follow this way because of the burdens of membership. CCPs are cautious while they determine which products they are going to clear to make sure they are safe. They use their own models to calculate risk measures of products before the clearing process.[219]

One of the most important policies Dodd-Frank brings is collecting initial margin. It is basically a kind of collateral. It is the main precaution for CCPs to protect themselves.[220] Central clearing counterparties collect initial margins when a member clears a contract. Initial margin can be in form of cash or another liquid asset. Clearinghouses adapt the initial margin according to the situation of the contract at fixed intervals.[221] The rationale behind collecting initial margin is to protect clearinghouses from possible member default

[213] Ibid
[214] Ibid
[215] Ibid
[216] Ibid
[217] Ibid
[218] Hester Pierce, 'Derivatives Clearinghouses: Clearing the Way to Failure' [2016] Cleveland State Law Review Vol 64:589
[219] Ibid
[220] Ibid
[221] Ibid

scenarios. Therefore, initial margin must be at adequate level to make the CCP maintains its usual operations in a default scenario.[222] Regulators and financial institutions endeavor to set initial margin to cover all the probable scenario losses as Knott and Mills state *"challenge faced by CCPs is to set initial margin at a level sufficient to provide protection against all but the most extreme price moves, but not so high as to damage market liquidity or discourage use of the CCP."*[223]

Collecting variation margin is another precaution to make CCPs safer.[224] Variation margin is also called mark-to-market margin. It depends on the portfolio of the clearing member. Daily market conditions affect the amount of variation margin to protect clearinghouses against potential future exposes.[225] The CCP members are responsible for the firms clear their products indirectly. The member has to manage risk issues and handle initial and variation margin requirements.[226]

Title VII and VIII of Dodd-Frank focus CCPs and the potential results of a CCP failure. The main regulation about CCPs is registration.[227] Derivatives clearing organizations (DCOs) are clearinghouses which registered to the CFTC to clear swaps. Clearing agencies are clearinghouses which registered to the SEC to clear security-based swaps.[228] Registration is obligatory to become these institutions and to clear given products. However, the CFTC or SEC can exempt some clearinghouses under another or foreign regulatory supervisions from registration. DCOs and clearing agencies are not new financial entities to response the GFC.[229]

The CFTC and SEC regard CCPs as self-regulatory organizations. Self-regulatory organizations codify their own rules. CCPs write and apply their provisions for their members.[230] However, the CFTC may interfere before the rule applies if it does not

[222] Ibid
[223] Raymond Knott & Alastair Mills, 'Modelling Risk in Central Counterparty Clearing Houses: A Review' [2002] FIN. STABILITY REV.
[224] Hester Pierce, 'Derivatives Clearinghouses: Clearing the Way to Failure' [2016] Cleveland State Law Review Vol 64:589
[225] Ibid
[226] Ibid
[227] Ibid
[228] Ibid
[229] Ibid
[230] Ibid

comply with the Commodity Exchange Act while the SEC approves the rules as a regular procedure.[231]

Dodd-Frank changed the older regulatory framework for CCPs. It set some principle-based regulations about such as financial resources, eligibility criteria for products and systemic risk management. Dodd-Frank requires every CCP must have a CCO (chief compliance officer).[232] Another important change Dodd-Frank brings is that it requires tighter regulations for systematically important central clearing counterparties. Congress considers CCPs as financial market utilities and they described the issue for financial market utilities as they "may reduce risks for their participants and the broader financial system, but such utilities may also concentrate and create new risks" and they need to be more heavily regulated. According to Title VIII of Dodd-Frank the CTFC and SEC have to codify and imply these raised risk management measures and the Board of the Governors of Federal Reserve System have a supportive regulatory role. It refers some risk management measures such as margin and default procedures.[233]

4.2. The E.U.

The EU brought a package of regulations with the goals of safer financial markets and better financial system as a response to the global financial crisis.[234] According to Guido Ferrarini and Paulo Saguato[235] *"the reforms targeted four main objectives: increasing transparency, managing counterparty credit risk, reducing systemic risk, and fostering operational efficiency.''* Some of these reforms directly focus on CCPs as they are explained further.[236]

European Market Infrastructure Regulations (EMIR) and its administrative provisions are the main regulatory framework for central clearing counterparties in the EU's regulation.[237] EMIR and its feature are defined by Norton Rose Fulbright as:

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[231] Ibid
[232] Ibid
[233] Ibid
[234] Guido Ferraini and Paulo Saguato, 'Regulating Financial Market Infrastructures' in Niamh Moloney, Eilis Ferran and Jennifer Payne (eds), *'The Oxford Handbook of Financial Regulation'* (First Edition, Oxford University Press, 2015) http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199687206.001.0001/oxfordhb-9780199687206 accessed '18 May 2018'
[235] Ibid
[236] Ibid
[237] Ibid

> *"The European Market Infrastructure Regulation (EMIR) is the new European regulation on over-the-counter (OTC) derivatives, central counterparties and trade repositories. It will implement the Group of Twenty (G20) commitment to have all standardised OTC derivatives cleared through a central counterparty in the European Union (EU) by the end of 2012 and is part of the worldwide effort to reduce counterparty and operational risk in the OTC derivatives market, which was identified as a contributing factor to the financial crisis."*[238]

Markets in Financial Instruments Directive (MiFID) II and Markets in Financial Instruments Regulation have applicable rules for central counterparties, however, this study focuses on mostly EMIR provisions.

The EMIR applies to any market participant that trades derivatives whether on over-the-counter or on an exchange.[239] It does not matter whether the trader is in the EU or not either.[240] The EMIR is a "regulation" in the EU Law that is a legal act becomes enforceable in all member states as soon as the European Union make them come into force.[241]

The fragility of the over-the-counter markets because of systemic risk was the main reason to change the regulations for financial market infrastructures (FMIs) and CCPs are one of the main institutions to be regulated because of their role in the financial system. [242] Clearing is a unique activity while it mitigates counterparty credit risk. Therefore it requires wider regulation.[243] According to EMIR if the CCP is in a member state it must be authorized by the competent authority of the country. If it is not in any member state it must be recognized by the European Securities and Markets Authority (ESMA). Hereof ESMA has brought some certain calculation methods to determine capital

[238] European Market Infrastructure Regulation: What You Need to Know http://www.nortonrosefulbright.com/knowledge/publications/62449/european-market-infrastructure-regulation-what-you-need-to-know 'accessed 18 May 2018'
[239] Ibid
[240] Ibid
[241] Ved P. Nanda, Ralph Haughwout Folsom and Ralph B. Lake (eds), *'European Union Law After Maastricht: A Practical Guide for Lawyers Outside the Common Market'* (The Hague, Kluwer 1996)
[242] Guido Ferraini and Paulo Saguato, 'Regulating Financial Market Infrastructures' in Niamh Moloney, Eilis Ferran and Jennifer Payne (eds), *'The Oxford Handbook of Financial Regulation'* (First Edition, Oxford University Press, 2015) http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199687206.001.0001/oxfordhb-9780199687206 'accessed 18 May 2018'
[243] Ibid

adequacies of the systemic risky firms.[244] Also CCPs must have sufficient amount of capital to avoid other types of risks such as credit risk, counterparty risk and market risk.[245]

EMIR brings corporate governance measure for CCPs to raise transparency, to prevent conflicts and to ensure accountability.[246] The ownership structure of a CCP must be transparent and changes in the structure must be notified to ESMA. Every CCP must express its risk management practices and control mechanisms because of the significance of monitoring and managing CCPs' risks.[247] Also each CCP must have a risk committee which has independent directors with clearing members. This committee must be consulted on changes that affect risk measure of the CCP.[248]

A CCP has to call and collect initial and variation margins just as in the U.S. from its members to protect itself and its members from credit counterparty risks. CCPs can also decide to haircuts for collateral value and can ask for further guarantees.[249] Gathering financial resources from its members to build a default fund is another kind of precaution to make CCPs more resistant. This precaution aims to mitigate credit counterparty risks of the CCP members and eventually systemic risk itself. The amount of the prudential capital must be sufficient to make sure the CCP maintains its usual services even if the two largest exposure holding members default.[250]

4.3. CPSS-IOSCO Principles for Financial Market Infrastructures

The Committee on Payment and Settlement Systems of the Bank for International Settlements and the Technical Committee of the International Organizations of Securities Commissions published the CPSS-IOSCO Principles for Financial Market Infrastructures (PFMIs) in 2012. The document is important to discuss because the principles are directly about safety and risk management issues for central clearing counterparties.

These principles are not obligatory for regulators to codify and there is no deadline determined to comply. However, they are strongly recommended.[251] Market participants and regulators have taken them seriously. Many major economies have carried out given

[244] Ibid
[245] Ibid
[246] Ibid
[247] Ibid
[248] Ibid
[249] Ibid
[250] Ibid
[251] CPSS-IOSCO's Principles for Financial Market Infrastructures SWIFT https://www.swift.com/our-solutions/cpss-iosco_s-principles-for-market-infrastructures accessed '18 May 2018'

assessments and have begun to bring regulatory schemes in accordance with these principles.[252] EMIR, Dodd-Frank and some other regional regulators countenance for application of these principles.[253]

The balance between safety and access is the key for CPSS-IOSCO principles according to Hester Pierce.[254] These provisions are twenty-four principles about matters such as credit and liquidity risk, collateral and margins, transparency.[255] This thesis will focus Principle 4 of the CPSS-IOSCO principles because of its importance for central clearing counterparties.

Principle 4 is about credit risk management[256] and called ''Cover 1/Cover 2" standard.[257] It is regarding the financial resources of the CCP for possible default scenarios.[258] Colleen M. Baker explains Cover 1 standard as:

> *To meet the Cover 1 standard, a clearinghouse must have financial resources sufficient to manage the default of the largest clearing member (and any affiliates) to which it has the greatest credit exposure in "extreme but plausible market conditions."*[259]

and Cover 2 standard as:

> *The "Cover 2" standard - primarily oriented to globally systemic clearinghouses and those clearing complex products such as CDS - requires a clearinghouse to have the financial resources to manage the default of its two largest clearing members (and any affiliates) to which it has the greatest credit exposure in "extreme but plausible market conditions.*[260]

[252] Ibid
[253] Ibid
[254] Hester Pierce, 'Derivatives Clearinghouses: Clearing the Way to Failure' [2016] Cleveland State Law Review Vol 64:589 https://www.mercatus.org/system/files/Clearinghouse-PDF.pdf accessed '19 May 2018'
[255] Ibid
[256] Hester Pierce, 'Derivatives Clearinghouses: Clearing the Way to Failure' [2016] Cleveland State Law Review Vol 64:589 https://www.mercatus.org/system/files/Clearinghouse-PDF.pdf accessed '19 May 2018'
[257] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '19 May 2018'
[258] Ibid
[259] Ibid
[260] Ibid

The CCPs which are registered to the CFTC have to fulfil a Cover 2 standard according to the CFTC. The SEC requires its CCPs to satisfy a Cover 2 standard as well.

About the Cover 1/Cover 2 standards it is vital to notice that CCPs serve as risk managers for both their members and the whole system (mitigating systemic risk).[261] The distinction must be done carefully.[262] *"CCPs are risk poolers, not insurance providers."*[263] Dietrich Domanski, Leonardo Gambacorta and Cristina Picillo of the Bank for International Settlements warn about the issue as:

> *The CCPs own liquid assets and backup liquidity lines made available by banks may provide effective insurance against liquidity shocks resulting from the difficulties of one or a few clearing members. But they can hardly provide protection in the event of a systemic shock when a large number of clearing participants – potentially including the providers of liquidity lines – become liquidity-constrained, thereby triggering domino effects.*[264]

Financial crises affect systematically important banks and financial institutions simultaneously.[265] These firms usually are members of multiple CCPs.[266] Also, these institutions mostly are service providers for CCPs as given before. So, all the CCPs face with stressful situations at the same time.[267] Domanski and others from the Bank for International Settlements explain as:

> *From an international perspective, risks can be correlated across CCPs in several jurisdictions. Given the overlapping memberships of many CCPs, liquidity problems at one CCP may well coincide with similar issues at others. A participant bank unable to meet obligations – possibly defaulting and entering resolution – could be a global player active in many centrally cleared financial markets and could therefore be a participant in several*

[261] Ben S. Bernanke, 'Clearing and settlement during the crash' [1990] Review of Financial Studies, Vol. 3, No. 1
[262] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '19 May 2018'
[263] Benöit Coeuré, *'Ensuring an Adequate Loss-absorbing Capacity of Central Counterparties'* [2015] the Federal Reserve Bank of Chicago Symposium on Central Clearing
[264] Dietrich Domanski, Leonardo Gambacorta, Cristina Picillo, 'Central clearing: trends and current issues' [2015] Bank for International Settlements
[265] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '19 May 2018'
[266] Ibid
[267] Ibid

CCPs. In the extreme case, the default of common clearing members could threaten the resilience of several CCPs at the same time.[268]

These global cooperations between CCPs and financial institutions are worth to consider as they help to relieve the default scenarios significantly in terms of financial resources.[269]

There is a debate raises about adequacy of the Cover 2 standard.[270] This inadequacy could result many problems.[271] Therefore, sufficiency of Cover 1 and Cover 2 standards started to be revised by policymakers around the globe.[272] "2015 CCP Workplan" can be given as an instance for studies of these policymakers.[273]

Determining a certain amount for 'adequate financial resource' might make clearing members leave the clearinghouse.[274] After a member defaults almost to the determined 'adequate financial resource' limit, non-defaulting members would understand the level of financial resources close to the shortage.[275] The level of stress will raise with these kinds of leavings.[276] Colleen M. Baker comes with a solution for these kind of scenarios as she explains *"instead of focusing on the appropriate level of financial cover, an alternative path might be to focus on whether clearinghouses should become regulated utilities or other options that explicitly recognize the reality that clearinghouses are almost certain to need government assistance to withstand a systemic crisis."*[277]

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[268] Dietrich Domanski, Leonardo Gambacorta, Cristina Picillo, 'Central clearing: trends and current issues' [2015] Bank for International Settlements

[269] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '19 May 2018'

[270] Benöit Coeuré, *'Ensuring an Adequate Loss-absorbing Capacity of Central Counterparties'* [2015] the Federal Reserve Bank of Chicago Symposium on Central Clearing

[271] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '19 May 2018'

[272] Ibid

[273] Chairs of the FSB SRC (Financial Stability Board Standing Committee on Supervisory and Regulatory Cooperation), FSB RESG (the Financial Stability Board Resolution Steering Group), BCBS (Basel Committee on Banking Supervision), CPMI (Committee on Payments and Markets Infrastructures), and IOSCO (International Organization of Securities Commissions), 2015 CCP Workplan [2015] http://www.fsb.org/wp-content/uploads/Joint-CCP-Workplan-for-2015-For-Publication.pdf accessed '20 May 2018'

[274] Craig Pirrong, 'The Economics of Central Clearing: Theory and Practice' [2011] ISDA

[275] Ibid

[276] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '20 May 2018'

[277] Ibid

5. What If They Fail?

Until this chapter derivatives market, central clearing counterparties and current related regulations are analyzed. This chapter is about the main question which is what should have done if central clearing counterparties fail to maintain stability of the financial system. The solution is important because central clearing counterparties are super-significantly important[278] financial intermediaries for the financial system.

Firstly, historical failures or near-failures of central clearing counterparties will be indicated in this chapter. Then the default-waterfall procedure will be explained. Finally recovery and resolution plans will be discussed with their differences and tools.

Even though it is a low probability, some clearinghouses failed in the past.[279] The failure of the Hong Kong Futures Exchange Clearing Corporation in 1987 can be given as an example.[280] It made a huge impact as Paul Tucker explains that *"basically, Hong Kong's securities markets all stopped, affecting households and firms well beyond the community who had had positions in stock-index futures."*[281] The FED helped to the United States banking system in terms of liquidity and tried to make banks lend to other financial institutions such as CCPs.[282] Craig Pirrong points out the issue as:

> *"the closest that US CCPs have come to default in modern times occurred when some large members of futures and options CCPs members [sic] faced acute funding strains during the Crash of 1987. To alleviate these strains, the Federal Reserve (indirectly) provided liquidity to brokerdealers and futures commissions merchants. Absent such liquidity, there was a serious risk of CCP failure.*[283]

[278] "Super-systemically important" is a term used by Benöit Coeuré, in Ensuring an Adequate Loss-absorbing Capacity of Central Counterparties at the Federal Reserve Bank of Chicago Symposium on Central Clearing (April 10, 2015).
[279] Craig Pirrong, 'The Economics of Central Clearing: Theory and Practice' [2011] ISDA
[280] Ibid
[281] Paul Tucker, 'Are Clearing Houses the New Central Banks?' [2014] Federal Reserve Bank of Chicago Clearing Symposium
[282] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '20 May 2018'
[283] Craig Pirrong, 'The Economics of Central Clearing: Theory and Practice' [2011] ISDA

A Korean security trader company which is a member of the CCPS called the Korea Exchange failed because of the losses from its derivatives deals.[284] The related CCP had to use contributions of the non-defaulting members of the default fund.[285] This situation got attention of non-defaulting members.[286] Member firms of CCPs understood these kinds of losses could happen in another global CCPs as well.[287] The Korean CCP made capital calls that had to be done in one month.[288] However it lasted to collect them much more than that time.[289] In theory CCPs can claim this kind of extra financial supports to maintain its services.[290] However, in practice, non-defaulting members might avoid to help in considered exact time.[291] This situation raises stress the level of the CCP much more.[292]

5.1. When A Member Fails

This chapter is about the pathway that CCP would follow if one of its members default. In general, firstly contribution of defaulting member will be used. Then other provisions which is called "default waterfall"[293] will be analyzed. However, these default procedures change according to regulatory field of the CCP, the CCP itself and some other measures.

Default of a member ruins the stability of the CCP.[294] The Clearinghouse must arrange transactions of the defaulting member and margins.[295] The amount of liquidity in the clearinghouse has to be at sufficient level to cover cost of the default process.[296] Firstly, initial margin of the defaulting member will be used to blanket the financial gap

[284] Mark P. Wetjen, CFTC Commissioner, 'Ensuring the Promise of a Centrally Cleared, Global Swaps Market: Next Steps, Remarks before the FIA' [Dec. 4, 2014] Derivative Conference
[285] Ibid
[286] Ibid
[287] Ibid
[288] Darrell Duffie, 'Resolution of Failing Central Counterparties', in Thomas Jackson, Kenneth E. Scott, and John B. Taylor (eds), '*Making Failure Feasible'* (Hoover Institution Press, 2015).

[289] Ibid
[290] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '20 May 2018'
[291] Ibid
[292] Ibid
[293] Hester Pierce, 'Derivatives Clearinghouses: Clearing the Way to Failure' [2016] Cleveland State Law Review Vol 64:589 accessed '20 May 2018'
[294] Ibid
[295] Jason Quarry et al., 'OTC Derivatives Clearing: Perspectives on the Regulatory Landscape and Considerations for Policymakers' [2012] Oliver Wyman Financial Services http://www.oliverwyman.com/content/dam/oliver-wyman/global/en/files/archive/2012/OTC_Derivatives_Clearing.pdf accessed '20 May 2018'

[296] Transcript of CFTC Market Risk Advisory Committee Meeting, (Apr. 2, 2015)

occurs from default in a process.[297] In cases initial margin of the defaulting member cannot cover the loss default waterfall process must be triggered.[298] This process consists of margins of defaulting and non-defaulting members, the guarantee fund and contribution of the clearinghouse in general.[299] Even if these funds are not enough to cover the gaps, the clearinghouse can touch the unfunded side of the default process.[300] It consists of assessments of additional funds and haircuts from the margin of non-defaulting members.[301]

Members of clearinghouses are faced with loss threats because of risky transactions of other members where a default waterfall process applies.[302] Therefore, members are being willing to eye other members.[303]

5.2. When Ordinary Measures Are Not Enough

The default waterfall described in the earlier chapter. The second part of the default waterfall which comes after default fund drains away is called "recovery plan" and it requires extraordinary measures.[304] This an exclusive process for clearinghouses because when other financial institutions come to this point they would start resolution procedure.[305] Clearinghouses must be treated differently because they are systematically important financial institutions, progression of their services are much more important than usual financial institutions'.[306] Tools of recovery plans are designed to brake the distressful situation of the CCP until market conditions return to normal.[307]

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[297] Hester Pierce, 'Derivatives Clearinghouses: Clearing the Way to Failure' [2016] Cleveland State Law Review Vol 64:589 accessed '20 May 2018'
[298] Ibid
[299] Ibid
[300] Ibid
[301] Ibid
[302] Hester Pierce, 'Derivatives Clearinghouses: Clearing the Way to Failure' [2016] Cleveland State Law Review Vol 64:589 https://www.mercatus.org/system/files/Clearinghouse-PDF.pdf accessed '20 May 2018'
[303] Raymond Knott & Alastair Mills, 'Modelling Risk in Central Counterparty Clearing Houses: A Review' [2002] FIN. STABILITY REV.

[304] Rama Cont, 'The end of the waterfall: default resources of central counterparties' [2015] Norges Bank Working Paper https://static.norges-bank.no/contentassets/95a70703b800463f9a85c5b1db5ac008/working_paper_16_15.pdf?v=03/09/2017123312&ft=.pdf accessed '21 May 2018'
[305] Ibid
[306] Ibid
[307] Ibid

Variation margin haircuts can be given as one of the most common tools of recovery plan. This is distribution of the loss to non-defaulting members by variation margin payments.[308] These payments must be enough to cover the loss of the defaulting member in theory.[309] These money acts as a recovered version of the default fund.[310] This situation is a temporary one which means once the CCPs is relieved clearing members can claim their payments back or they can request the shares of the clearinghouse.[311] The amount of variation margin haircutting is finite with the positions of the defaulting member.[312] Variation margin might not be satisfactory to cover the loss and to reshape the positions at the same time in some cases.[313]

The rationale behind the recovery is deficit of liquidity of the clearinghouse.[314] Clearinghouses must be able to reach liquidity of central banks in these kinds of cases because they are systematically important.[315] Besides central banks, other recovery tools like variation margin haircuts is another type of seeking for liquidity, however, this time the clearinghouse claim liquidity from its non-defaulting members and this process must be transparent.[316] These liquidity deals can be done with a collateralized loan, a repo or a swap transaction.[317] About the central bank facility, if the clearinghouse and its clearing members are from various jurisdictions which is it is expected that only one central bank would help to the clearinghouse in terms of liquidity.[318] Other central banks are expected to help limited by their interests such as the number of clearing members in their

[308] Ibid
[309] Ibid
[310] Ibid
[311] Ibid
[312] 'Recovery of Financial Market Infrastructures' Committee on Payments and Market Infrastructures and Board of the International of Organization of Securities Commission [2014] Bank for International Settlements https://www.bis.org/cpmi/publ/d121.pdf accessed '21 May 2018'
[313] Ibid
[314] Rama Cont, 'The end of the waterfall: default resources of central counterparties' [2015] Norges Bank Working Paper https://static.norges-bank.no/contentassets/95a70703b800463f9a85c5b1db5ac008/working_paper_16_15.pdf?v=03/09/2017123312&ft=.pdf accessed '21 May 2018'
[315] Ibid
[316] Ibid
[317] Recovery of Financial Market Infrastructures' Committee on Payments and Market Infrastructures and Board of the International of Organization of Securities Commission [2014] Bank for International Settlements https://www.bis.org/cpmi/publ/d121.pdf accessed '21 May 2018'
[318] Rama Cont, 'The end of the waterfall: default resources of central counterparties' [2015] Norges Bank Working Paper https://static.norges-bank.no/contentassets/95a70703b800463f9a85c5b1db5ac008/working_paper_16_15.pdf?v=03/09/2017123312&ft=.pdf accessed '21 May 2018'

jurisdictions.[319] A CCP also can seek liquidity from third party firms such as its affiliated companies.[320]

About central bank facilities, Colleen M. Baker argues that assistance from central banks are more helpful than directly covering collaterals and defaulting member's positions by liquidity.[321] However, liquidity assistance also results some issues such as moral hazard.[322] About this issue Manmonah Singh states as:

> *"CB backstopping of CCPs is shifting the potential taxpayer bailout from Wall Street to entities such as ICE, CME or LCH.Clearnet/ Swapclear. This transition is increasingly opaque to the ordinary taxpayer, especially since moving derivatives from SIFIs' books to those of CCPs is mired in convoluted arguments and impenetrable technical jargon."*[323]

Even after variation margin haircuts, if the distress cannot be alleviated the clearinghouse can use another recovery tool which is called contract tear-ups.[324] This provides for clearinghouses to close particular open positions to slow down the effects of losses.[325] ISDA defends about this tool, it is an unpleasant way to decrease distress because it is not compatible with the main idea of clearinghouses.[326] This process depends on the types of contracts and positions of the defaulting member which means that non-defaulting members or the clearinghouse cannot determine which contracts are going to be teared-up properly.[327] Loss allocation between clearing members raises due

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[319] Ibid

[320] Recovery of Financial Market Infrastructures' Committee on Payments and Market Infrastructures and Board of the International of Organization of Securities Commission [2014] Bank for International Settlements https://www.bis.org/cpmi/publ/d121.pdf accessed '21 May 2018'

[321] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '21 May 2018'

[322] Colleen M. Baker, 'The Federal Reserve as Last Resort' [2012] University of Michigan Journal of Law Reform 69

[323] Manmonah Singh, 'Making OTC Derivatives Safe' [2011] IMF Working Papers http://www.imf.org/external/pubs/ft/wp/2011/wp1166.pdf accessed '21 May 2018'

[324] Rama Cont, 'The end of the waterfall: default resources of central counterparties' [2015] Norges Bank Working Paper https://static.norges-bank.no/contentassets/95a70703b800463f9a85c5b1db5ac008/working_paper_16_15.pdf?v=03/09/2017123312&ft=.pdf accessed '21 May 2018'

[325] Ibid

[326] 'CCP Loss Allocation at the End of the Waterfall' [2013] ISDA https://www.isda.org/a/jTDDE/ccp-loss-allocation-waterfall-0807.pdf accessed '21 May 2018'

[327] Rama Cont, 'The end of the waterfall: default resources of central counterparties' [2015] Norges Bank Working Paper https://static.norges-bank.no/contentassets/95a70703b800463f9a85c5b1db5ac008/working_paper_16_15.pdf?v=03/09/2017123312&ft=.pdf accessed '21 May 2018'

to lack of transparency and instability of the situation gets deeper as contract tear-ups being done one by one.[328]

There are some questions raise about usage of initial margins which can be stated as 'can CCPs use initial margin of non-defaulting members for liquidity source in a recovery situation?'[329] The reason of collecting initial margin is to use them to cover losses when the same member defaults.[330] This is why the default fund and margin collaterals are different resources.[331] Using initial margin contributions in a recovery process means converting them into default fund.[332] Calculating the amount of the default fund more carefully and more detailed could be a solution for the issue.[333]

5.3. Resolution Plans

There are many common points between recovery and resolution.[334] Differences mostly occur from whether "loss allocation" obtained contract-based or with an administrative decision.[335] ISDA (2013) points out an issue about the choice between them as: *"the primary goal in a default situation should be recovery and continuity of the CCP, the need for resolution cannot be excluded and resolution mechanisms must also be in place."*[336] The questions are when administrative organizations can stop the recovery process and push the clearinghouse into a resolution process and 'can they do that?'[337]

Alleviating the stress level for all the market participants must be the main purpose of a CCP resolution plan.[338] Financial Stability Board (2017) points the goals of resolution process as:

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[328] Ibid
[329] Ibid
[330] Ibid
[331] Ibid
[332] Ibid
[333] Ibid
[334] Darrell Duffie, 'Resolution of Failing Central Counterparties', in Thomas Jackson, Kenneth E. Scott, and John B. Taylor (eds), '*Making Failure Feasible'* (Hoover Institution Press, 2015)
[335] Ibid
[336] CCP Loss Allocation at the End of the Waterfall' [2013] ISDA https://www.isda.org/a/jTDDE/ccp-loss-allocation-waterfall-0807.pdf accessed '21 May 2018'
[337] Darrell Duffie, 'Resolution of Failing Central Counterparties', in Thomas Jackson, Kenneth E. Scott, and John B. Taylor (eds), '*Making Failure Feasible'* (Hoover Institution Press, 2015)
[338] Darrell Duffie, 'Resolution of Failing Central Counterparties', in Thomas Jackson, Kenneth E. Scott, and John B. Taylor (eds), '*Making Failure Feasible'* (Hoover Institution Press, 2015)

> *"CCP resolution should have as its objective the pursuit of financial stability and ensure the continuity of critical CCP functions in all jurisdictions where those functions are critical and without exposing taxpayers to risk of loss."*[339]

Also, to manage risk measures better, resolution plan must be transparent and predictable to some level.[340] Fire sales can be prevented due to predictability.[341] Government bailout process cannot be applied to CCPs legally.[342] This makes the CCP managers and its members would anticipate that they are going to be accountable eventually.[343] If it has come to the resolution status, it means that the CCP has spent almost all of its financial resources.[344] It is unexpected that the CCP can meet its liabilities against its members with this limited liquidity.[345]

Alternatives of liquidating a CCP are these followings as Darrell Duffie (2015) states:

> *"Reorganize the CCP through some combination of new capital injections and restructuring of its clearing obligations. The debt of the CCP can also be restructured, but in practice CCPs do not usually have much debt."* Or *"Transfer the clearing obligations of the CCP, if necessary after some restructuring, to another existing CCP or to a "bridge" CCP."*[346]

According to JPMorgan Chase & Co. current market solutions instead of recapitalization include some issues as they explain:

> *"Maintaining critical operations of the CCP should be the driving principal in default. Existing industry solutions advocate, and CCP frameworks seem to favor, tear-up and/or liquidation as the current solution to resolution. This is largely because neither a clear recapitalization fund nor a practical*

[339] Guidance on Central Counterparty Resolution and Resolution Planning [2017] Financial Stability Board
[340] Darrell Duffie, 'Resolution of Failing Central Counterparties', in Thomas Jackson, Kenneth E. Scott, and John B. Taylor (eds), '*Making Failure Feasible*' (Hoover Institution Press, 2015)
[341] Ibid
[342] Ibid
[343] Ibid
[344] Ibid
[345] Ibid
[346] Ibid

resolution plan for CCPs has yet been discussed. However, there are several issues with liquidation as a preferred solution."[347]

To sum, the CCP must be in a position where it can maintain its vital services in and this position must be more like recapitalization rather than liquidation.

Even if there is no contractual agreement courts or competent administrative institution may decide to variation margin haircuts or contractual tear-up tools rather than resolution.[348] However, the CCP and its members can agree upon a clause that enables to the clearing members leave the CCP in a default situation.[349] Duffie and Skeel (2013) recommend that there can be a certain temporary duration determined to stay in the CCP for its members to achieve an efficient struggle in a default situation.[350] Exercising an insolvency facilitation rather than triggering a CCP resolution process are preferred according to statements of both the EU and the US.[351]

If the bridge-based resolution process would apply, clearing agreements will be transferred to the new CCP including default fund and collaterals such as initial margins.[352] Transferred stuff must include subsidiary assets such as intellectual property rights as well.[353] If resolution is triggered because of default losses the bridge CCP must take both good and bad thing like assets and liabilities at the same time.[354] Manmohan Singh (2014) argues about a resolution plan based on bridge CCP that their usage is questionable.[355]

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[347] What is the Resolution Plans for CCPs? [2014] JPMORGAN CHASE & CO. Office of Regulatory Affairs https://www.jpmorganchase.com/corporate/About-JPMC/document/resolution-plan-ccps.pdf accessed '22 May 2018'

[348] Darrell Duffie, 'Resolution of Failing Central Counterparties', in Thomas Jackson, Kenneth E. Scott, and John B. Taylor (eds), '*Making Failure Feasible'* (Hoover Institution Press, 2015)

[349] Ibid

[350] Darrell Duffie and David A. Skeel, 'A Dialogue on the Costs and Benefits of Automatic Stays for Derivatives and Repurchase Agreements' in K.E. Scott and J.B. Taylor (eds), *'Bankruptcy Not Bailout: A Special Chapter'* (Hoover Press, 2012)

[351] Darrell Duffie, 'Resolution of Failing Central Counterparties', in Thomas Jackson, Kenneth E. Scott, and John B. Taylor (eds), '*Making Failure Feasible'* (Hoover Institution Press, 2015)

[352] Ibid

[353] Ibid

[354] Manmohan Singh and Dermot Turing, 'Central Counterparties Resolution – An Unresolved Problem' [2018] IMF Working Paper WP/18/65 https://www.imf.org/~/media/Files/Publications/WP/2018/wp1865.ashx accessed '23 May 2018'

[355] Manmohan Singh, 'Limiting Taxpayer 'Puts' – An Example From Central Counterparties' [2014] IMF Working Paper No 14/203

Substitution of the failed CCP as a solution to maintain the vital services in the market is not the most preferred choice:[356]

> *"For many centrally cleared products, the market is either vertically integrated with execution venues (i.e. in the futures market) or a single CCP is the only clearer for specific OTC derivatives, repo or securities products. In each case, in order to transact in these products, market participants are required to clear their transactions through a single CCP without an option to easily replace the risk in the event of a CCP failure."*

Even if the substitution applied, the other CCP might be in a different jurisdiction.[357] It could result some cross-border problems[358] as they will be discussed later.

Financial Stability Board (2017) states to maintain a proper resolution process, the resolution authority must calculate and evaluate financial resources to get goals of

> *"addressing uncovered losses; replenishing resources in line with regulatory requirements within an appropriate timeframe; to meet costs associated with maintaining and operating the critical functions of the CCP until exit from resolution, including the costs for critical dependencies such as service-level agreements, third-party service providers, or other key dependencies and to meet temporary liquidity needs."*[359]

It continues importantly:

> *Jurisdictions should have effective resolution regimes and policies in place so that authorities are not constrained to rely on public bail-out funds to resolve a CCP. If, as a last resort and for the overarching purpose of maintaining financial stability, a jurisdiction determines that temporary public funding is necessary to achieve an orderly resolution, the resolution authority should have the power to recover such funding from the CCP or*

[356] 'Recovery of Financial Market Infrastructures' Committee on Payments and Market Infrastructures and Board of the International of Organization of Securities Commission [2014] Bank for International Settlements https://www.bis.org/cpmi/publ/d121.pdf accessed '23 May 2018'

[357] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '23 May 2018'

[358] What is the Resolution Plans for CCPs? [2014] JPMORGAN CHASE & CO. Office of Regulatory Affairs https://www.jpmorganchase.com/corporate/About-JPMC/document/resolution-plan-ccps.pdf accessed '22 May 2018'

[359] Guidance on Central Counterparty Resolution and Resolution Planning [5 July 2017] Financial Stability Board

any successor entity, or any amounts obtained from a defaulting counterparty of the CCP, or from CCP participants or other market participants, in order to minimise the risk of losses to taxpayers and in a way that maintains incentives to support recovery measures of the CCP. [360]

The resolution authority must take into account complexity, risk level of the cleared products, inaccuracy of the amounts of collaterals, the size of the market.[361] Public funding support should be considered in a resolution process.[362] If it is applicable in some law frameworks, public funding must be the last resort, limited with a time frame and able to be regained in a proper time.[363] If it applies, regains must be reflected to temporary public funds before anything else.[364] The phrase of temporary might continue a very long time, therefore it must be based on a solid and realistic practices.[365] Public disclosure is mandatory for all the process of temporary public funding.[366] The disclosure must be written in accordance with legal regime.[367] Also, the transactions and structure of the CCP must be transparent and clear about how the resolution plan is being executed and the status of recoveries in the written disclosure.[368]

The major central clearing counterparties have clearing members from different jurisdictions. Also, the counterparties of their members might come from different jurisdictions. Most of the transactions they clear have multinational features. All the given aspects could lead some cross-border problems in resolution processes.[369] Therefore, there must be clear international rules and guidelines to relieve given cross-border issues regarding to those complicated central clearing counterparties.[370] About the issue Thomas Murray Data Services (2017) believes capital market supervision institutions have

[360] Ibid
[361] Ibid
[362] Ibid
[363] Ibid
[364] Ibid
[365] Guidance on Central Counterparty Resolution and Resolution Planning [1 February 2017] Financial Stability Board
[366] Guidance on Central Counterparty Resolution and Resolution Planning [5 July 2017] Thomas Murray Data Services, Consultative Document, Financial Stability Board
[367] Ibid
[368] Ibid
[369] Rama Cont, 'The end of the waterfall: default resources of central counterparties' [2015] Norges Bank Working Paper https://static.norges-bank.no/contentassets/95a70703b800463f9a85c5b1db5ac008/working_paper_16_15.pdf?v=03/09/2017123312&ft=.pdf accessed '23 May 2018'
[370] Ibid

decent coordination regarding multinational financial market infrastructures.[371] Authors of the firm suggest that there must be certain liquidity provisions.[372] The resolution authority should consider the failure as the whole clearinghouse starts to be dissolved with its members, the web that is created by the members and the assets.[373] The crisis managers of the resolution authorities should establish a team in communication with each other as soon as possible.[374]

The Financial Services Act of 2012, in the UK, has brought a resolution plan for CCPs which are authorized under the Bank of England.[375] In the US, the Federal Deposit Insurance Corporation (FDIC) may administrate resolution processes of central clearing counterparties.[376] Besides those national rules, the Global Financial Markets Association states about cross-border issues:

> *"To the extent key functions of the FMI are performed through an affiliated group of entities, some of which may be formed in jurisdictions other than the home jurisdiction of the FMI, it is essential that the resolution process encompass all such entities in a single process, and that all applicable jurisdictions agree to respect the determinations of the primary jurisdiction. During the financial crisis, we have seen circumstances in which courts in two jurisdictions claimed jurisdiction over a dispute, rendered conflicting judgments, and refused to enforce each other's judgments—leaving market participants with no clear form of redress. Where multiple resolution authorities may claim jurisdiction over a single FMI, including as a result of different jurisdictions of formation of its affiliates, these authorities should agree in advance as to which authority has primary jurisdiction and how to ensure that its determinations have finality in other jurisdictions."*[377]

[371] Guidance on Central Counterparty Resolution and Resolution Planning [5 July 2017] Thomas Murray Data Services, Consultative Document, Financial Stability Board
[372] Ibid
[373] Ibid
[374] Ibid
[375] Darrell Duffie, 'Resolution of Failing Central Counterparties', in Thomas Jackson, Kenneth E. Scott, and John B. Taylor (eds), '*Making Failure Feasible'* (Hoover Institution Press, 2015)
[376] Ibid
[377] Global Financial Markets Association [2012] https://www.bis.org/cpmi/publ/comments/d103/theglobalfin.pdf accessed '23 May 2018'

Another question was that 'when can authorities start a resolution process?'[378] It is hard to answer, but necessary question.[379] Timing of consideration is crucial to provide financial stability against CCP balance sheet issues.[380]

[378] Darrell Duffie, 'Resolution of Failing Central Counterparties', in Thomas Jackson, Kenneth E. Scott, and John B. Taylor (eds), '*Making Failure Feasible'* (Hoover Institution Press, 2015)
[379] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] Working Paper The Volcker Alliance http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '23 May 2018'
[380] Manmohan Singh, 'Limiting Taxpayer 'Puts' – An Example From Central Counterparties' [2014] IMF Working Paper No 14/203

6. Conclusion

It can be concluded that safety of central clearing parties is essential for the whole financial world in the new regulatory framework after the Global Financial Crisis of 2008. As it is described in the chapter one, the current regulations regarding central clearing counterparties do not provide complete safety for financial markets.

It is possible to state that both the Dodd-Frank Act of the United States[381] and EMIR/MiFIR/MiFID II of the European Union[382] have some regulatory gaps. The damages of the Global Financial Crisis of 2008 were severe. If a financial crisis happens because of failure of a central clearing counterparty, its results would be much higher[383] because of their position in the financial system.

Over-the-counter derivatives markets are complex and opaque for both market participants and regulators as it is shown in the chapter one. They can be used for many purposes and by various financial or non-financial business entities. Their usage area makes their track harder to follow. Also, there are advanced financial innovations among derivatives such as credit default swaps and collateralized debt obligations which make the financial field weaker.

All the derivatives dealer institutions are exposed counterparty credit risks by each other. These exposures create a huge web of transactions. If a bank fails in the web, the effect of the failure puts the other institutions in a risky situation. This effect is called "contagion"[384] and that was what happened in the GFC of 2008.

Thus, the G20 has brought a few provisions to mitigate the risks of over-the-counter derivatives market. It is said that "*All standardized OTC derivative contracts should be … cleared through central counterparties by end-2012 at the latest."*[385] When

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[381] David Skeel, 'What if a clearinghouse fails?' [2017] Brookings Institute https://www.brookings.edu/research/what-if-a-clearinghouse-fails accessed '25 May 2018'

[382] BNP PARIBAS, 'Central Counterparty Recovery and Resolution Regulation (CCP) – regulation memo' [2018] BNP Paribas Securities Services http://securities.bnpparibas.com/insights/ccp-regulation-memo-2018.html accessed '25 May 2018'

[383] "*what happens if they go bust? I can tell you the simple answer: mayhem. As bad as, conceivably worse than, the failure of large and complex banks."* Paul Tucker in Brussels https://www.theguardian.com/business/blog/2011/oct/24/clearing-house-collapse-mayhem-bank accessed '25 May 2018'

[384] Xavier Freixas et al., *Systemic Risk, Crises, and Macroprudential Regulation* (MIT Press, 2015)

[385] EUR-Lex - 52009DC0563 https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52009DC0563&from=en accessed '25 May 2018'

central clearing counterparties intervene between derivatives transactions contagion effect decreases.

There are many advantages of mandatory clearing as chapter three explains them. Multilateral netting relieves counter party credit and liquidity risks. Clearinghouses makes the derivatives market more transparent. They provide more efficient default solutions.[386]

However, central clearing counterparties have disadvantages as well. Adverse selection and moral hazard issues can be counted for negative sides of mandatory clearing.[387] Concentrating counterparty credit risks in itself is the most obvious problem. If a central clearing counterparty fails that would result worse than consequences of contagion effect.

Therefore, precautions against a failure of a central clearing counterparty are analyzed in chapter five. The risk because of failure of a central counterparty starts when one of its members default. The "default waterfall" must be implemented when the systemic risk begins to occur.

The first provision to mitigate that risk is using the margins of the defaulting member. If this amount cannot cover the losses, the clearinghouse can use contributions of the defaulting member and non-defaulting members to the default fund respectively. After that, central counterparty has to use its own contributions for default scenarios.[388]

All the given precautions can be insufficient to cover the losses. After that point, the central counterparty can apply recovery mechanisms that include a few extraordinary provisions. The two main measures are contractual margin gain haircuts and contractual tear-ups.[389]

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[386] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] The Volcker Alliance Working Paper http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '25 May 2018'

[387] Ibid

[388] Guido Ferraini and Paulo Saguato, 'Regulating Financial Market Infrastructures' in Niamh Moloney, Eilis Ferran and Jennifer Payne (eds), *'The Oxford Handbook of Financial Regulation'* (First Edition, Oxford University Press, 2015) http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199687206.001.0001/oxfordhb-9780199687206 accessed '25 May 2018'

[389] Darrell Duffie, 'Resolution of Failing Central Counterparties', in Thomas Jackson, Kenneth E. Scott, and John B. Taylor (eds), '*Making Failure Feasible'* (Hoover Institution Press, 2015)

Resolution process are like recovery plans. The resolution plans apply with certain official entities those are called resolution authorities. Resolution process include more issues because of nature of the process.

The most urgent gaps are regulatory blanks that miss failure regimes of clearing counterparties. The Dodd-Frank Act of the US can be given as an example for those gaps.[390] Filling those gaps are vital but easy at the same time. Considering central counterparties as subject to Title II of the Dodd-Frank might be a simple solution.[391]

Rest of the gaps are about failure procedures. Establishing proper recovery and resolution plans is the way how to fix those regulatory problems. For example using initial margin of non-defaulting members cannot apply in default scenarios.[392] However, they can be used in extreme default scenarios temporarily to some extent in view of the author.

The summary of the central counterparties issue is that "*there are several advantages to but … using does not risk; indeed it concentrates risk."*[393] While failure a single significant bank affects the financial system, the institution where all the significant banks gather around cannot be allowed to fail. All the market participants, regulators and central clearing counterparties should work together to establish a safer financial system.[394] Also, regulators must improve current regulations about recovery and resolution plans of central counterparties. The aim must be to establish safer and more efficient markets.

[390] David Skeel, 'What if a clearinghouse fails?' [2017] Brookings Institute https://www.brookings.edu/research/what-if-a-clearinghouse-fails accessed '1 June 2018'
[391] Ibid
[392] Guido Ferraini and Paulo Saguato, 'Regulating Financial Market Infrastructures' in Niamh Moloney, Eilis Ferran and Jennifer Payne (eds), *'The Oxford Handbook of Financial Regulation'* (First Edition, Oxford University Press, 2015) http://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199687206.001.0001/oxfordhb-9780199687206 accessed '18 May 2018'
[393] Douwe Miedema, 'Clearing Houses Are Big Risk, Top U.S. Federal Researcher Says' [May 15, 2015] Reuters https://www.reuters.com/article/us-regulation-summit-berner/clearing-houses-are-big-risk-top-u-s-federal-researcher-says-idUSKBN0O024O20150515 accessed '25 May 2018'
[394] Colleen M. Baker, 'Clearinghouses for Over-the-Counter Derivatives' [2016] The Volcker Alliance Working Paper http://cms.ineteconomics.org/uploads/downloads/Clearinghouses_FINAL_ONLINE.pdf accessed '25 May 2018'

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