**Draft**

Due to the highly sensitive position of a CCP in financial market, in this report, I will not write about and sesitive information includes custmer's information and CME Default Management's working details. Insrtead I will focus on what knid of knowledge is important and my own experience gained from daily working.

1. ***The structure of the report (name of each section):***
2. Introduction to default management group (3 – 4 pages)
3. Requirement of the position and interview (1 – 2 pages)
4. Preparation of Drill (part one): Liquidity and Liquidity Poll (3 – 4 pages)
5. Preparation of Drill (part two): Default Management Tools (3 – 4 pages)
6. Default Management Drill (6 – 8 pages)
7. Other Topics (1 – 2 pages)
8. Experience learned and Summary (1 – 2 pages)

Introduction to CME group:

**CME Group Inc.** (Chicago Mercantile Exchange & Chicago Board of Trade) is a global markets company.[[3]](https://en.wikipedia.org/wiki/CME_Group#cite_note-3) It owns large [derivatives](https://en.wikipedia.org/wiki/Derivative_(finance)), [options](https://en.wikipedia.org/wiki/Option_(finance)) and [futures exchanges](https://en.wikipedia.org/wiki/Futures_exchange) in [Chicago](https://en.wikipedia.org/wiki/Chicago) and [New York City](https://en.wikipedia.org/wiki/New_York_City) using its CME Globex [trading platforms](https://en.wikipedia.org/wiki/Trading_platform).[[4]](https://en.wikipedia.org/wiki/CME_Group#cite_note-4)[[5]](https://en.wikipedia.org/wiki/CME_Group#cite_note-5) It also owns CME Clearing which provides settlement and clearing of exchange trades. CME Group offers the widest range of global benchmark products across all major asset classes based on interest rates, equity indexes, foreign exchange, energy, agricultural products and metals.[[6]](https://en.wikipedia.org/wiki/CME_Group#cite_note-6) It has been described by [*The Economist*](https://en.wikipedia.org/wiki/The_Economist) as "The biggest financial exchange you have never heard of".[[7]](https://en.wikipedia.org/wiki/CME_Group#cite_note-7)

The corporate world headquarters are in [Chicago](https://en.wikipedia.org/wiki/Chicago) in [The Loop](https://en.wikipedia.org/wiki/Chicago_Loop). The corporation was formed by the 2007 merger of the [Chicago Mercantile Exchange](https://en.wikipedia.org/wiki/Chicago_Mercantile_Exchange) (CME) and the [Chicago Board of Trade](https://en.wikipedia.org/wiki/Chicago_Board_of_Trade) (CBOT). The next year it bought the [New York Mercantile Exchange](https://en.wikipedia.org/wiki/New_York_Mercantile_Exchange).

Brief history to CME:

In 2007, two long rival exchanges, the Chicago Mercantile Exchange and the Chicago Board of Trade combined to form CME Group. Both exchanges had been leading global futures and derivatives markets. While both had historically been owned by member-traders (known as "mutual" ownership), in the years just prior to the merge, both had become [public corporations](https://en.wikipedia.org/wiki/Public_corporations).

The next year, on March 17, 2008, [New York Mercantile Exchange](https://en.wikipedia.org/wiki/New_York_Mercantile_Exchange) (NYMEX), which had also recently "demutualized", accepted an offer from CME Group to purchase NYMEX for $8.9 billion in cash and CME Group Stock. [[8]](https://en.wikipedia.org/wiki/CME_Group#cite_note-8) The acquisition was formally completed on August 22, 2008, and the NYMEX systems were fully integrated by September 30, 2009.[[9]](https://en.wikipedia.org/wiki/CME_Group#cite_note-9) Also in 2007, NYMEX in a joint venture with partners on the [Arabian Peninsula](https://en.wikipedia.org/wiki/Arabian_Peninsula) opened the [Dubai Mercantile Exchange](https://en.wikipedia.org/wiki/Dubai_Mercantile_Exchange) (DME).[[10]](https://en.wikipedia.org/wiki/CME_Group#cite_note-10)

On February 10, 2010, CME announced its purchase of 90% of Dow Jones Indexes, including the [Dow Jones Industrial Average](https://en.wikipedia.org/wiki/Dow_Jones_Industrial_Average).[[11]](https://en.wikipedia.org/wiki/CME_Group#cite_note-11) CME subsequently contributed Dow Jones Indexes to the formation of [S&P Dow Jones Indices](https://en.wikipedia.org/wiki/S%26P_Dow_Jones_Indices) in exchange for a 24.4% ownership interest.[[12]](https://en.wikipedia.org/wiki/CME_Group#cite_note-12) In April 2013, CME purchased the remaining 10% interest in Dow Jones Indexes for $80.0 million. As a result, CME's interest in [S&P Dow Jones Indices](https://en.wikipedia.org/wiki/S%26P_Dow_Jones_Indices) increased from 24.4% to 27.0%.[[13]](https://en.wikipedia.org/wiki/CME_Group#cite_note-13)

On October 17, 2012, CME Group announced it would acquire the [Kansas City Board of Trade](https://en.wikipedia.org/wiki/Kansas_City_Board_of_Trade) for $126 Million in cash. KCBOT is the dominant venue for the sale of [hard red winter wheat](https://en.wikipedia.org/wiki/Hard_red_winter_wheat). The Chicago Board of Trade is the leading trade platform for [soft red winter wheat](https://en.wikipedia.org/wiki/Soft_red_winter_wheat).[[14]](https://en.wikipedia.org/wiki/CME_Group#cite_note-14)[[15]](https://en.wikipedia.org/wiki/CME_Group#cite_note-15)

On November 1, 2017, CME Group announced they would begin trading in [Bitcoin](https://en.wikipedia.org/wiki/Bitcoin) futures by the end of 2017, pending regulatory approval.[[16]](https://en.wikipedia.org/wiki/CME_Group#cite_note-16)[[17]](https://en.wikipedia.org/wiki/CME_Group#cite_note-17)

On March 29, 2018, CME Group announced that it was buying London-based [NEX Group](https://en.wikipedia.org/wiki/NEX_Group) for $5.5 billion.[[18]](https://en.wikipedia.org/wiki/CME_Group#cite_note-18) The acquisition was completed on November 2, 2018.[[19]](https://en.wikipedia.org/wiki/CME_Group#cite_note-19)[[20]](https://en.wikipedia.org/wiki/CME_Group#cite_note-20)

1. ***The content of each section:***
2. Introduction to default management group

The topic of this part is to give the readers a broad picture of the systematic risk in CCPs and why default management is important in mitigating the systematic risk and counterparty credit risk. In this section, first I will introduce the background and definition of default management (include the background before and after the 2008 crisis). The reason of introducing the background is to let the readers know the reason why a CCP should have Default Management. Then I will explain the role and function of Default Management group at CME and its relationship with other CCPs. I will also explain how default management group cooperate with other groups at CME group.

Intro to DM: part I

When a Clearing Member (“CM”) defaults, the house portfolio of the defaulted clearing member and any of its defaulted customers need to be liquidated. Here are key steps to a successful Default Management Procedure (“DMP”): • DMPs should be designed to reflect the market structure of the cleared products incorporating a set of well thought out strategies and tools while still allowing for enough flexibility and discretion to remain nimble and effective in the face of ever unpredictable distressed market conditions. - For listed derivatives where in general the market is liquid and has transparent central order limit books, DMP should use the markets and engage a broad set of market participants on a voluntary basis to auction off the portfolio - For OTC markets the market structure has not evolved to a large central market. Instead there are several pools of liquidity some on SEFs and others still transacted bilaterally. To account for these changes in market structure, DMP should be more structured, where a CCP should use the expertise of seasoned traders to formulate the appropriate hedging and auction strategies. The auction participation is generally an obligation for clearing members. However, we believe buy side should not be excluded from auction participation • For OTC markets, it is imperative to execute macro level hedges to reduce large directional risk of the defaulted portfolio(s) as soon as practicable • Once the risk of the defaulted portfolio has been neutralized or sufficiently reduced, CCP should auction it off. - CCP should develop and implement a number of auction styles that correspond to a particular asset class, product category, and the risk of the portfolio and the market conditions. • Defaulted CM’s collateral should be liquidated, as needed, to meet DM costs and variation margin • The process of porting non-defaulted customers to healthy CMs should start simultaneously

Part II:

CME believes that CCPs cooperation is one of the critical elements of prudent, efficient, scalable and effective DMP • CME has reached out to other CCPs to discuss possible ways to coordinate • Several initiatives have been identified - Joint default management exercises. - Coordination of traders secondment across CCPs - Finding a solution to risk offsetting transactions across CCPs with respect to the defaulted portfoli o

Intro: Drill

Creation of hypothetical defaulted portfolio • Generation of simulated market data sets for all days of the drill • Incorporation of simulated market data into CME systems for valuation and risk calculation • Production of risk reports for ADMC traders and firms • Production of hedge calculation worksheets for ADMC traders • Developing and testing the new auction platform • Multiple conference calls, and individual communication with all firms to educate participants on using the platform, for creating users, file download, and submitting bids • Mock auctions for firms to test the auction platform for all its features • Set up and testing of war room resources at New York and London offices • Coordination of a pre-drill valuation exercise with the firms • CME Internal dry runs • Distribution of drill process timelines, scope, clarifications, and updates to firms

Drill: IRS & CDS

CME conducts DM drills across all asset classes twice a year to test and continuously enhance - DM procedures - DM systems - Communication with CMs - Participation of CMs in hedging and auction phase - Bidding incentives • DM Drills – Resources - War rooms equipped with laptops, telephones, internet, teleconferencing, secured email access, Bloomberg, and Reuters are set up at New York and London offices • DM Drills – Hedging Phase - On Day 1 of the default, CME staff executes initial macro level hedges to reduce the main risk of the portfolio - ADMC traders are seconded to the secured CME offices in London and New York - Detailed risk reports are presented to the traders - ADMC formulate their hedging strategy and recommend further hedges - CME staff books the hedges into CME systems and re-run the risk reports - The hedged portfolio details are distributed to all firms using CME’s web based application “CME Auction Platform” and via FTP

• DM Drills – Auction Phase - On Day 2, CME conducts an intermediate conference call with non-defaulting member firms to address any outstanding technical issues - On Day 3 or 4, Auctions are conducted on CME Auction Platform - This platform provides a very efficient, secure, and automated means of conducting auctions - Bidders from the CMs submit their bids using CME Auction Platform - Winners are determined and award notifications are sent by the Auction Platform - Clearing member firms are informed of the hypothetical impact of their bids on the seniority of their GF utilization • DM Drills – Cost of DM calculations - Throughout the drill, CME staff keeps track of the costs mentioned below to calculate the following costs - Hedging cost - Variation Margin cost - Auction cost - The total cost of default management is then compared with the collateral on hand (given by initial margin) and the liquidation assumptions of the margin model.

Default by a clearing member:

The failure of a customer to meet its financial obligations to its Clearing Member, which does not cause the failure of the Clearing Member to meet its financial obligations to the Clearing House, is managed by the Clearing Member and therefore, outside the scope of this document. CME Clearing’s financial safeguards system includes processes related to managing defaults for both exchange-traded and cleared swaps markets. CME Clearing’s risk management and financial surveillance techniques are designed to minimize the possibility that a Clearing Member will default on its obligations to CME Clearing. CME Clearing, by Rule and by operational practice, has prepared contingencies to expeditiously deal with the unlikely event of a Clearing Member default. A Clearing Member may be declared to be in default when it fails to promptly discharge any obligation to CME Clearing,11 including but not limited to failure to satisfy its financial obligations to CME Clearing. Upon the default of a Clearing Member, CME will attempt to port all non-defaulting customers as quickly as practicable to a non-defaulting Clearing Member. CME Clearing will work to identify stable Clearing Members with similar or complimentary customer profiles who may be well placed to absorb solvent customers prior to the default of the distressed Clearing Member, minimizing the amount of time necessary to port customers once the default has been declared. Under Chapter 8 of CME Group Exchange Rulebook, CME Clearing has the right to immediately transfer customer positions and associated performance bond value to a non-defaulting Clearing Member, when the default did not occur in such customer account. In managing past Clearing Member default events, performance bond funds collected from the defaulted Clearing Members were sufficient to cover the associated losses and CME Clearing was able to quickly transfer all customer positions and collateral to non-defaulting Clearing Members, preserving customers’ access to CME Clearing’s services. In the event of a default of a Clearing Member, depending upon the products cleared by the particular Clearing Member, CME Clearing may utilize the appropriate Guaranty Fund(s) and financial safeguards waterfall(s), in which the Clearing Member participates, but may not use those in which the defaulted Clearing

Member does not participate. As previously mentioned, CME Clearing maintains two waterfall structures, one for Base product and one for IRS products. The layers of the financial safeguards waterfalls create a pre-defined and transparent structure of protections that give Clearing Members the information needed to assess potential liabilities in the event of a Clearing Member default. Each financial safeguards waterfall is structured in the same way, where the default of a Clearing Member will result in the utilization of the performance bonds and Guaranty Fund contributions of the defaulted Clearing Member first, and then in the unlikely event those funds are insufficient the CME Clearing contribution would be utilized, followed by the non-defaulting Clearing Members’ Guaranty Fund contributions, and lastly funds collected through the assessment of non-defaulting Clearing Members – with the waterfall(s) associated with the defaulted Clearing Member’s membership(s) only being utilized. In the event CME Inc. is facing severe stress, unrelated to a Clearing Member default, Clearing Member and customer assets are bankruptcy remote from CME Inc.’s estate.

Guaranty Funds

CME Clearing’s rules are designed to maximize the safety of the mutualized pool of Guaranty Funds. CME Clearing’s Guaranty Fund practices are consistent with regulatory requirements and industry standards and subject to review and approval by the appropriate CME Clearing Risk Committee. The Guaranty Funds are designed to cover the tail risk of potential losses in excess of performance bond (considered stress shortfall) under extreme but plausible scenarios, as measured by stress tests. Consistent with CFTC Regulation 39.33(a), the Guaranty Funds for each waterfall are sized to cover the potential loss caused by the simultaneous default of the two Clearing Members and their affiliates with the largest potential shortfalls, within the individual major asset class. This is commonly referred to as “Cover Two”. For all major asset classes, the largest potential losses from hypothetically defaulting Clearing Members are identified through a series of stress tests simulating extreme but plausible market fluctuations based on historical data for individual products as well as hypothetical stresses. The stress test results are reviewed by the CME Clearing Stress Testing Committee at least on a monthly basis, in addition to daily reviews of the results to ensure adequacy of the Base and IRS Guaranty Funds. Results are also shared with the appropriate CME Clearing Risk Committees. Each Clearing Member is required to contribute a risk-based, or minimum amount, to the Guaranty Fund of the waterfall for each major asset class it clears. The minimum contributions are defined in CME Group Exchange Rules 816 and 8G07 for the Base and IRS waterfalls, respectively. Individual Clearing Member contributions to the Base Guaranty Fund12 are computed as the greater of $500,000 or the results of a formula under which 95% of the total requirement is based on the Clearing Member’s proportionate contribution to aggregate risk performance bond requirements over the prior three months and the remaining 5%is based on the Clearing Member’s contribution to risk-weighted transaction activity over the prior three months. Individual Clearing Member contributions to the IRS Guaranty Fund are computed as the greater of the $15 million or the Clearing Member’s proportional share of the IRS Guaranty Fund 12 Clearing members that clear OTC products covered in the Base Guaranty Fund must maintain a minimum Guaranty Fund deposit of $2.5 million. 13 http://www.cmegroup.com/clearing/cme-clearing-overview/safeguards.html based on (a) a 30-day trailing average of their Portfolio Residual Loss, which is the tail risk the IRS Clearing Member brings to the Clearing House (90%) and (b) a 30-day trailing average of its gross notional (10%). CME Clearing recalculates the Base and IRS Guaranty Funds requirements on at least a monthly basis, but may resize the Guaranty Funds more frequently as market conditions warrant. This is to ensure the Guaranty Funds for each waterfall are sized to cover the defaults of the two largest Clearing Members and their affilaites. The aggregate size of the Guaranty Fund contributions for each major asset class are disclosed on the CME Group website and updated regularly.

13 CME Clearing Contrbiution

CME Clearing believes it’s critical that a clearing house commit a meaningful first-loss contribution to the waterfall structure, in advance of a mutualized Clearing Member Guaranty Fund, to further align the incentives of the Clearing House and market participants. The size of the designated CME Clearing Contribution for each asset classes’ waterfall structures are also covered under CME Group Exchange Rules 802 and 8G802 for Base and IRS, respectively.

Assessment Powers

The final layer of the financial safeguards waterfall is CME Clearing’s assessment powers against non-defaulting Clearing Members. Assessment powers are determined independently for the Base and IRS financial safeguards waterfalls to ensure coverage of extreme tail events in each specific major asset class. For the Base financial safeguards waterfall, assessment powers cannot exceed 2.75 times each non-defaulting Base Clearing Member’s Base Guaranty Fund requirement for a single default. For the IRS financial safeguard waterfall, assessment powers are sized to cover the default of the third and fourth largest IRS Clearing Member stress shortfalls. In the event that the Guaranty Fund is drawn on to cover losses caused by a Clearing Member default, each non-defaulting Clearing Member is required to replenish its Guaranty Fund contributions by close of business the business day following the utilization of the Guaranty Fund, subject to any applicable cooling off periods – 5 business days for the Base financial safeguards waterfall and 25 business days for the IRS financial safeguards waterfalls under CME Group Exchange Rule 802.H and 8G802.H, respectively. Default Management Default management practices are designed to ensure the continuity of CME Clearing’s services. CME Clearing has established practices and procedures that allow the clearing house to operationally manage a Clearing Member default while simultaneously maintaining continuity of clearing services to non-defaulting Clearing Members. CME Clearings acts in the event of either a Clearing Member house account or Clearing Member customer account default are described in detail below.

1. Requirement of the position and interview

The topic of the part two is to introduce the requirement of the position and the interview base on what I have explained at part one. Firstly, the hard skill required by this position is the understanding of basic derivatives and the skills in Python and Excel VBA. For the derivatives such as options, futures, swaps, one should not understand the contract specs, way of trading but also the method to hedge a portofolio that contains these instruments. The sofe skills is also very important, though not very hard to learn, but in dayliy communication with other groups and other companies, it is critial to perform nicly and professionally. Also, during the interview, some related questions were asked and I leaened that why they asked it and what can be asked in different interviews.

1. Preparation of Drill (part one): Liquidity and Liquidity Poll

The Topic of the part three is to give a overall view of the liquidity risk in default management and the way to view the liquidity risk at a CCP (or system) level. I will also compare the systematic risk, credit risk and liquidity risk at the CCP level and then expalin why people spent more time on tracting and mitigating the liquidity risk. Thirdly, I will introduce the general way to evaluate the liquidity risk and what kind of tools we can acquire from open source and what how we should use that. I will also analyse the importance of data and thus the importance of keep the data confidential. At last, I will analyse the difference in liquidity risk management in difference derivative and emphasize the importance of liquidity risk management under the new risk management and regulation environmant atfer the crisis.

1. Preparation of Drill (part two): Default Management Tools

The topic of this part is to introduce the skills I learned from building and improving the risk management tools; and I will also analyse the importance of knowing coding skills and what knid of coding skill is more preferrable given difference careers in financial area. Two of the language I have been worked with is Python and Excel VBA. For Python, I basically use it to improve the efficiency of calculating massive amount of data and do some manipulation for multiple target which is hard to be applied with automation. For VBA, it is more faced to daily use and for small data sizes. I will anaiyze these two skills. Also, I will mention about C#，and R. Then I will analyze which is more important for buy side, sell side or CCPs.

1. Default Management Drill

In the part I will focus on the most important part of default management, which is the Default Drill. First, I will introduce what is Default Drill. I will then explain why the drill is important to any systematic important financial institute. How different department and company could possibly come together and perform as there is a major bankruptcy happens. Secondly, I will generally introduce what I was doing and what skills and knowledge are used during the drill. At third, I will analyze the result and effect of a general default drill. Since the same drill will also be applied in other CCPs and big banks. I will analyze what they will learn from the drill and thus why it is important for the whole financial system. At last, I will summarize what I have learned from the default drill and how can I use the idea of it when I were working at another position.

1. Soft skills

In the section I will briefly examine some minor projects and what I have learned form them. So far, I plan to summarize what I have learned from negotiating with the staff from Bloomberg and what I have learned from some social (volunteering) events. In these activities I learn more soft skills than hard skills. However, the soft skills are also important in career life. At the last few paragraphs of the section I will analyze some of the most important soft skills.

1. Experience learned and Summary

This section is the conclusion of the whole paper. In this section I will first summarize all the experience and skills I gained form my internship. Also, I will summarize what are the mistakes I have made in this internship and how I can prevent making more of the mistakes. At last, at both individual level and whole industry level, I will try to forecast the development of default management in not only USA but also global derivative market. On top of this, based my expectation, I will analyze what kind of change it will bring to the financial market and financial students like me.