



CCPS AGAIN DEMONSTRATE STRONG RESILIENCE IN TIMES OF CRISIS

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A CCP12 PAPER

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LIST OF ABBREVIATIONS

AIG	American International Group, Inc.
APAC	Asia-Pacific
BCBS	Basel Committee on Banking Supervision
BCM	Business Continuity Management
BCP	Business Continuity Plan
BoE	Bank of England
CAD	Canadian Dollar
CC	Corona Crisis
CCP	Central Counterparty
CDS	Credit Default Swaps
CM	Clearing Member
CME	Chicago Mercantile Exchange
CNY	Chinese Yuan Renminbi
CPMI	Committee on Payments and Market Infrastructures
CPSS	Committee on Payment and Settlement System
DF	Default Fund
DTCC	Depository Trust & Clearing Corporation
ECAG	Eurex Clearing AG
EMEA	Europe, the Middle East and Africa
EMIR	European Market Infrastructure Regulation
EU	European Union
EUR	Euro
FICC	Fixed Income Clearing Corporation
FMI	Financial Market Infrastructure
FSB	Financial Stability Board
GBP	British Pound
GFC	Global Financial Crisis
GSD	Government Securities Division
HKD	Hong Kong Dollar
HKCC	HKFE Clearing Corporation Ltd.
HKEX	Hong Kong Exchanges and Clearing Ltd.
HKSCC	Hong Kong Securities Clearing Ltd.
ICC	ICE Clear Credit
ICE	Intercontinental Exchange, Inc.
ICEU	ICE Clear Europe
ICE N.A.	ICE North America
ICUS	ICE Clear U.S.
IM	Initial Margin
IMF	International Monetary Fund
IOSCO	International Organisation of Securities Commissions
JPY	Japanese Yen
JSCC	Japan Securities Clearing Corporation
MBSD	Mortgage-Backed Securities Division
NCM	Non-Clearing Member
NSCC	National Securities Clearing Corporation

OCC	The Options Clearing Corporation
OECD	Organisation for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
OTC	Over-The-Counter
OTCC	OTC Clearing Hong Kong Ltd.
PFMI	Principles for Financial Market Infrastructures
PQD	Public Quantitative Disclosure
PSE	Philippine Stock Exchange
QoQ	Quarter-over-Quarter
SARS-CoV-2	Severe Acute Respiratory Syndrome Corona Virus 2
SEOCH	SEHK Options Clearing House Ltd.
UK	United Kingdom
U.S.	United States
USD	US-Dollar
VIX	CBOE Volatility Index
VM	Variation Margin
WHO	World Health Organization
WTI	Western Texas Intermediate

1. INTRODUCTION

Financial markets react to all kinds of events, which may include those that are politically, economically or environmentally driven. In times of crises, the impact is amplified and often felt across large parts of the global financial markets and the global economy. This was observed during the 2020 COVID-19 Crisis (“CC”). Due to the uncertainty in the markets, volatility spiked to extraordinary levels – stocks, interest rates and oil prices fell and credit spreads widened. During this unprecedented time of market volatility, financial market participants needed the ability to effectively manage their risks. The centrally cleared markets have proven, once again, to be a safe haven for market participants during this period of extreme stress.

As described further in this paper, Central Counterparties (“CCPs”), which are Financial Market Infrastructures (“FMI”), have contributed to supporting stable and safe financial markets during this crisis.

In particular, CCPs provided market participants with an efficient and effective forum to manage their risks, whilst providing transparency and operational reliability. This was despite the significant operational challenges presented by the circumstances that surrounded responses to coronavirus, as well as the extraordinary levels of volatility, as depicted in Subchapter 2.2. As noted in Chapter 3, CCPs observed significant increases in Variation Margin

(“VM”) due to the observed market moves but were able to process these payments as well as clear and settle a higher volume of transactions in a timely manner. Whilst VM captures the current mark-to-market exposure of a participant’s portfolio (where CCP’s facilitate the exchange of these funds between their participants), Initial Margin (“IM”) is held by the CCP to cover the potential future exposure of its participants’ portfolios, using at least a 99% coverage standard. CCPs design their IM requirements to cover a variety of potential market moves, however, market moves that capture “extreme but plausible market conditions” are designed to be captured in a CCP’s Default Fund (“DF”) requirements. Due to the extreme levels of volatility observed over the course of the CC, most CCPs were required to issue margin calls as a result. CCPs strive to strike an appropriate balance between achieving appropriate margin

COVID-19

The Severe Acute Respiratory Syndrome Corona Virus 2 (“SARS-CoV-2”) was first identified in Wuhan, China in December 2019. The official name of the infectious disease – as announced by the World Health Organization (“WHO”) on 11th of February 2020 - is “COVID-19, short for coronavirus disease 2019”¹ and in this paper, we will use the terms “coronavirus” and “COVID-19” to describe the virus and the disease. The outbreak of the coronavirus and the responses to prevent the virus from spreading has presented risks to local and global economies. The Organisation for Economic Co-operation and Development (“OECD”) warned on the 02nd of March 2020 that “the world economy is at risk” and projected the “annual global GDP growth [...] to drop to 2.4% in 2020 as a whole, from an already weak 2.9% in 2019, with growth possibly even being negative in the first quarter of 2020”.²

¹ “Novel Coronavirus – situation report”; WHO; 11th of February 2020; Accessed: 28th of June 2020; (https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200211-sitrep-22-ncov.pdf?sfvrsn=fb6d49b1_2)

² “Coronavirus: the world economy at risk”; OECD; 02nd of March 2020; Accessed: 28th of June 2020; (<http://www.oecd.org/berlin/publikationen/Interim-Economic-Assessment-2-March-2020.pdf>)

Basics of a CCP

A CCP acts as an intermediary and legally interposes itself between buyers and sellers of financial instruments traded on the financial markets for which it provides clearing services, becoming the buyer to every seller and the seller to every buyer. A CCP is a market risk neutral, creditworthy counterparty that guarantees the financial performance of the trades it clears, including in the event of a default of one of the parties. The buyers and sellers can either be Clearing Members (“**CMs**”), which are approved by the CCP and are permitted to clear directly at the CCP, or they can be Clients / Non-Clearing Members (“**NCMs**”), who do not directly face the CCP and must clear their trades via a clearing account through an appointed CM.

coverage and mitigating procyclical risk. In striking this balance, CCPs must consider having appropriate margin coverage, whilst also avoiding unnecessary procyclical changes to IM requirements relative to the observed levels of market volatility. Ultimately, CCPs proved once again, as they have in past crises, that they provide safety and stability to the markets that they serve, particularly during periods of stress.

In the next section, we present the resilience of CCPs during financial crises, summarising the events of the Global Financial Crisis (“**GFC**”) and highlighting

the volatility spikes of different asset classes in the GFC and the CC. Then we explain the importance of robust operations, show the observed clearing volumes during the CC, call attention to the successfully executed Business Continuity Plans (“**BCPs**”) in the CC, highlight some margin figures in the CC and conclude with noting one minor suspension that occurred during the CC.

2. RESILIENCE OF CCPS IN CRISES

CCPs have successfully demonstrated their resilience during past and present crises. This can be observed by comparing the GFC in 2008 - 2009 with the 2020 CC. In both cases, CCPs managed market and operational risks and mitigated credit and liquidity risks³ – in short: fulfilling their purpose as designed – despite extraordinary volumes and high volatility in exceptional times.

In the next subchapters, we will highlight the important role CCPs played in the last global crisis, the GFC. We will look at different asset classes – Equities, Interest Rates, Crude and Credit Default Swaps (“**CDS**”) – and will highlight the volatility spikes seen during the GFC and the CC. Across the asset classes shown, the volatility during the CC surpassed the volatility seen in the GFC. And still, CCPs managed the crisis extremely well.

2.1 THE GLOBAL FINANCIAL CRISIS

During the collapse of Lehman Brothers in late 2008, CCPs demonstrated flexibility by suspending or limiting market access of defaulting entities within a short time frame; providing stability and certainty to Lehman Brothers’ counterparties and to the whole financial market; and responding comprehensively to settle the vast majority of Lehman Brothers’ cleared positions with no losses to CCPs or their non-defaulting participants⁴. The Lehman Brothers default and the performance of CCPs is explained in greater detail in the CCP12 paper “Central Counterparty Default Management and the Collapse of Lehman Brothers”⁵. At the resulting GFC, “[f]inancial market infrastructures, particularly CCPs, have functioned well, despite the challenging external financial and operational conditions”³.

Given CCPs successful navigation of the GFC, at the G20 summit in Pittsburgh, the G20 agreed to improve the resilience of Over-The-Counter (“**OTC**”) derivatives markets, by mandating that “all standardized OTC derivative contracts should be [...] cleared through central counterparties by end-2012 at the latest”⁶.

G20 reforms

Global standards that cover resiliency standards for CCPs include the “Principles for Financial Market Infrastructures” (“**PFMI**”) published by the Committee on Payments and Market Infrastructures (“**CPMI**”) and the International Organisation of Securities Commissions (“**IOSCO**”) in April 2012. These standards were then adopted by local jurisdictions across the globe – e.g., the “Dodd-Frank Act” in the United States (“**U.S.**”) and the “Regulation of the European Parliament and of the Council on OTC Derivatives, Central Counterparties and Trade Repositories” – European Market Infrastructure Regulation (“**EMIR**”) in the European Union (“**EU**”).

³ “COVID-19 pandemic: Financial stability implications and policy measures taken”; FSB; 15th of April 2020; Accessed: 28th of June 2020; (<https://www.fsb.org/wp-content/uploads/P150420.pdf>)

⁴ HKSCC losses were fully recovered.

⁵ “Central Counterparty Default Management and the Collapse of Lehman Brothers”; CCP12; April 2009; Accessed: 28th of June 2020; (<https://ccp12.org/wp-content/uploads/2017/05/CCPDefaultManagementandtheCollapseofLehmanBrothers.pdf>)

⁶ “G20 Leaders Statement: The Pittsburgh Summit”; University of Toronto; 29th of November 2011; Accessed: 28th of June 2020; (<http://www.g20.utoronto.ca/2009/2009communique0925.html>)

The positive outcomes from the G20 regulatory reforms^{7,8,9,10} together with the resilience of CCPs, that has only been further enhanced since the GFC, have resulted once again in stable and safe global financial markets during the CC, which is the first global stress event since the GFC. Although, in comparison to 2008, product offerings and volumes have increased and while the CC situation “far outweighs anything experienced during the global financial crisis in 2008-09”¹¹, CCPs again performed exceptionally.

2.2 VOLATILITY DURING THE CORONA CRISIS

The implications of a financial crisis can be illustrated by examining the response to overall market volatility. As depicted below, extreme levels of volatility were observed over the course of the CC and in many cases matching or exceeding the levels of volatility observed during the GFC. Over the course of the CC, at a high-level the following was observed:

- **EQUITIES:** Equities demonstrated consistent upticks in volatility over the CC with the CBOE Volatility Index (“**VIX**”) starting at 13.46 in January 2020 and then reaching its all-time high of 82.69 in March 2020. Similarly, the S&P 500 reached a high of above 3,300 points in February 2020 and then over a one-month period dropped by more than 1,000 points.
- **INTEREST RATES:** Generally, interest rates across the globe were reduced from their pre-CC levels. In particular, the percentages changes for interest rates observed for the U.S. and UK were comparable to those observed during the GFC.
- **CRUDE OIL:** Crude Oil West Texas Intermediate (“**WTI**”) Futures prices dropped sharply during mid-April, following a slow descent since the beginning of 2020.
- **CREDIT DEFAULT SWAPS:** The CDS market observed extreme CDS market realizations and a period of severely increased CDS risk premia. The relative spread widening and tightening realizations were 2x+ of the ones observed during GFC.

Despite these volatile markets, CCPs were able to manage this volatility and continue to provide market participants a forum to effectively manage their risks.

⁷ “Principles for financial market infrastructures”; BIS; April 2012; Accessed: 28th of June 2020; (<https://www.bis.org/cpmi/publ/d101a.pdf>)

⁸ Formerly known as the Committee on Payment and Settlement System (“**CPSS**”)

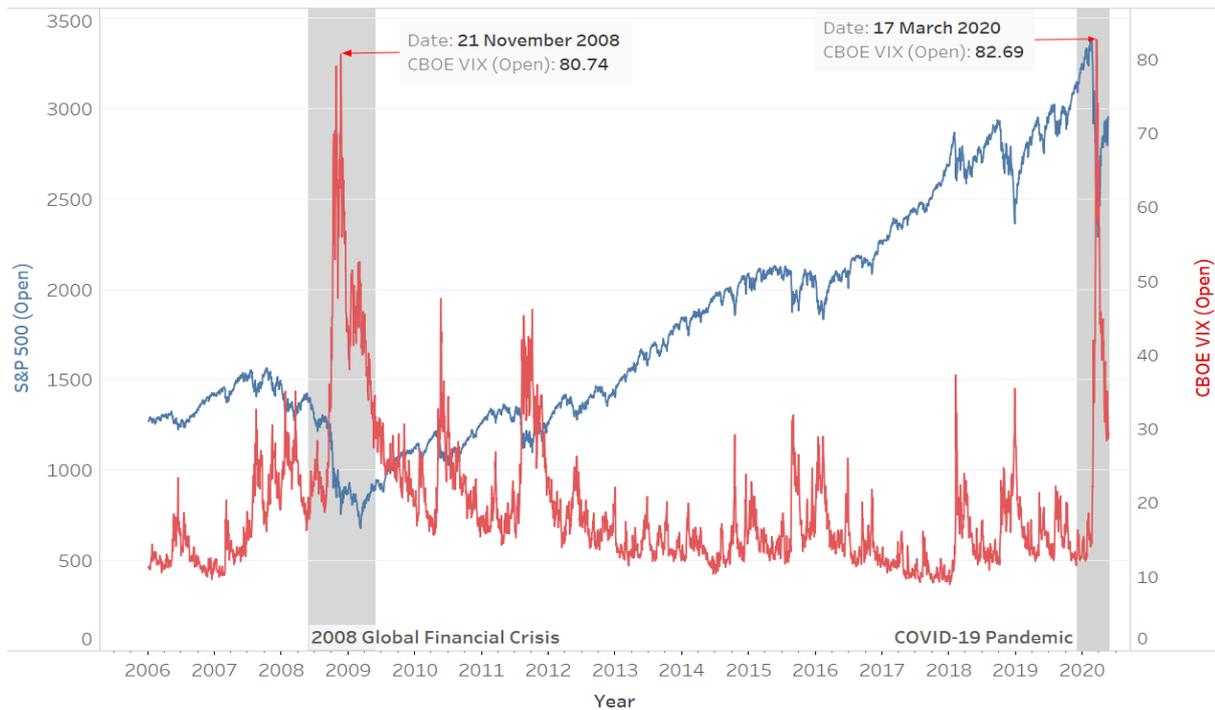
⁹ “Derivatives”; U.S. Securities and Exchange Commission; 05th of April 2015; Accessed: 28th of June 2020; (<https://www.sec.gov/spotlight/dodd-frank/derivatives.shtml>)

¹⁰ “Regulation on OTC Derivatives, central counterparties and trade repositories”; EUR-Lex; 04th of July 2012; Accessed: 28th of June 2020; (<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R0648&from=EN>)

¹¹ “Evaluating the initial impact of COVID-19 containment measures on economic activity”; OECD; 10th of June 2020; Accessed: 28th of June 2020; (https://read.oecd-ilibrary.org/view/?ref=126_126496-evgsi2gmqj&title=Evaluating_the_initial_impact_of_COVID-19_containment_measures_on_economic_activity)

2.2.1 EQUITIES

We compare the change of the VIX with the change of the S&P 500 index. The VIX is a “a real-time market index that represents the market’s expectation of 30-day forward looking volatility, as derived from the price inputs of S&P 500 index options. It measures market risk and investor sentiment (fear, stress) and is often called the fear index.”¹² The S&P 500 is an equity index that measures the stock performance of 500 large companies listed on stock exchanges in the U.S.



The trends of S&P 500 (Open) and CBOE VIX (Open) for Date Day. Colour shows details about S&P 500 (Open) and CBOE VIX (Open). The view is filtered on Date Day, which ranges from 4 January 2006 to 20 May 2020.

Key
■ CBOE VIX (Open)
■ S&P 500 (Open)

Figure 1: CBOE VIX vs. S&P 500 movements from 2006 to today

During the GFC (shown in Figure 1), the VIX reached its peak of 80.86 on the 20th of November 2008. Since that date, and until the beginning of 2020, the VIX has only had a single day, on the 03rd of October 2011, where it recorded a price higher than 45. At the beginning of 2020, the VIX started at 13.46 on the 2nd of January 2020 and started to spike from mid-February 2020 to the end of that month to 40. In March 2020 in the midst of the CC, the VIX escalated until it reached its all-time high of 82.69 on the 16th of March 2020. Since then, the VIX has retreated to below 40.

Further, during the CC, the S&P 500 had reached its all-time high of above 3,300 points in late February 2020. In one month (from the 20th of February 2020 until the 23rd of March 2020) the S&P 500 dropped by approximately 34%. Since then it slowly recovered and by the end of May 2020 it had again added 25% reaching the 3,000 mark. Compared to the CC, the S&P 500 dropped by approximately 41% in the GFC, but it started at a lower level (dropping from approximately 1,300 points to approximately 750 points).

¹² „The VIX’s wild ride”; SIFMA; 23rd of April 2020; Accessed: 28th of June 2020; <https://www.sifma.org/resources/research/the-vixs-wild-ride/>

2.2.2 INTEREST RATES

An additional method to demonstrate the implications of a crisis is the comparison of Interest Rates before and after a crisis. By way of example we looked at 5 different regions or countries and the corresponding benchmark Interest Rates:

- United States of America – United States Fed Funds Rate
- United Kingdom (“UK”) – United Kingdom Interest Rate
- India – India Interest Rate
- Brazil – Brazil Interest Rate
- EU – Euro Area Interest Rate

	Before GFC	After GFC	Delta	% Delta	Before CC	During CC	Delta	% Delta
U.S. ¹³	2.00	0.25	1.75	87.50%	1.75	0.25	1.50	86.00%
UK ¹⁴	5.00	0.50	4.50	90.00%	0.75	0.10	0.65	87.00%
India ¹⁵	7.00	4.25	2.75	39.00%	5.15	4.00	1.15	22.00%
Brazil ¹⁶	13.75	8.75	5.00	36.00%	4.50	2.25	2.25	50.00%
EU ¹⁷	4.25	1.00	3.25	76.00%	0.00	0.00	0.00	0.00%

Table 1: Interest Rate comparison

Table 1 shows, that the Interest Rates before the GFC in all the identified countries/regions were high and dropped sharply during the GFC. In the U.S., UK and India, Interest Rates recovered slightly in the past 12 years leading up to the current crisis. In Brazil, no trend could be observed as the Interest Rate was lowered and increased several times during this time period. The Euro Area Interest Rate, was increased after the GFC for a short time-period to 1.5%, but since then has steadily decreased. Further, since the beginning of 2016, the Euro Area Interest Rate has been 0% to negative. During the CC, interest rates – apart from EU interest rates - have fallen again.

¹³ “United States Fed Funds Rate”; Trading Economics; 28th of June 2020; Accessed: 28th of June 2020; (<https://tradingeconomics.com/united-states/interest-rate>)

¹⁴ “United Kingdom Interest Rate”; Trading Economics; 28th of June 2020; Accessed: 28th of June 2020; (<https://tradingeconomics.com/united-kingdom/interest-rate>)

¹⁵ “India Interest Rate”; Trading Economics; 28th of June 2020; Accessed: 28th of June 2020; (<https://tradingeconomics.com/india/interest-rate>)

¹⁶ “Brazil Interest Rate”; Trading Economics; 28th of June 2020; Accessed: 28th of June 2020; (<https://tradingeconomics.com/brazil/interest-rate>)

¹⁷ “Euro Area Interest Rate”; Trading Economics; 28th of June 2020; Accessed: 28th of June 2020; (<https://tradingeconomics.com/euro-area/interest-rate>)

2.2.3 CRUDE OIL

Next, we look at fluctuations in the crude oil market. Oil is one of the most important natural resources in the international commodity market. As seen during the CC, international travel bans and major economy lockdowns resulted in an extreme drop in demand, coupled with disagreements among major oil suppliers to restrict the supply.

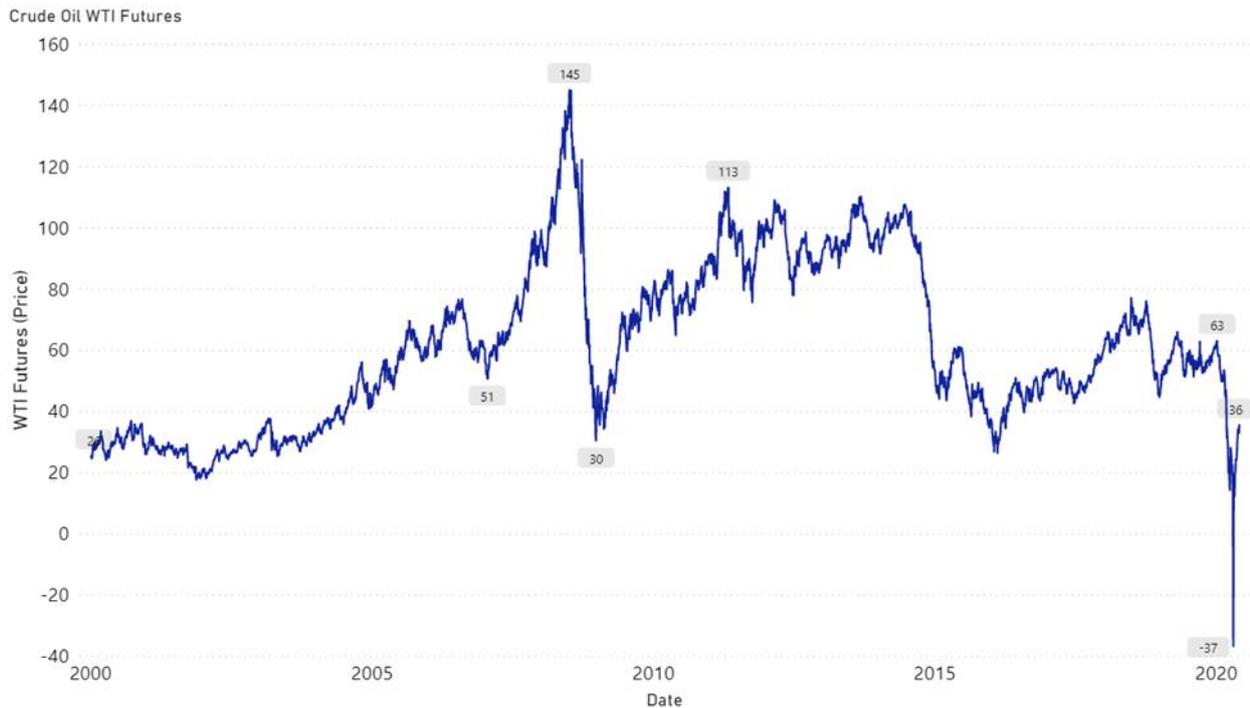


Figure 2: Crude Oil WTI Future - 20-year lookback period

The Crude Oil WTI Future for U.S. crude is the world’s most liquid crude oil contract. During the GFC, the future dropped in price from 140 USD per barrel to under 40 USD per barrel in 7 months as shown in Figure 2. In the CC, however, oil prices dropped – after a slow descent since the beginning of 2020 – sharply on the 17th of April 2020 from nearly 18 USD per barrel to a negative price per barrel on the 20th of April 2020.

Supply-Demand Dynamics for Crude Oil

The shutdowns and travel restrictions, which were applied by the governments worldwide due to the coronavirus pandemic, reduced the demand in factory output and transportation and caused the global fall in demand for oil and subsequent fall of oil prices. At the OPEC summit on the 05th of March 2020, the members decided to cut the oil production as storage is limited and asked all non-OPEC members to comply with the OPEC decision. Russia however, decided not to follow this path. Saudi Arabia then announced unexpected price discounts to selected regions, which let the oil prices fall further. Shortly afterwards, both, Russia and Saudi Arabia, decided to increase their oil production again, which led to even lower oil prices with decreasing demand and insufficient storage capacity.^{18,19} Although, on the 09th of April 2020, OPEC members and Russia agreed to reduce the global oil production by 10 million barrel per day, storage capacity was still scarce.²⁰ The WTI crude prices for future delivery rose well above the spot market leading to a negative oil price for the first time in recorded history.²¹ This situation – known as contango – is rare.

This occurred on extremely low volume one day before the expiry of front month contract, when the market had already rolled to the second month. However, it was simply a reflection of the demand and supply dynamics that existed for U.S. crude oil. The WTI contract did exactly what it was designed to do, which is reflect these dynamics and to efficiently converge with the underlying physical spot price.

The price of the underlying – the Crude Oil WTI – however, had a much more severe drop at the beginning of the CC from the 6th till the 9th of March 2020. Over the weekend, the oil price dropped by over 27%. The catalyst for this drop was the failed negotiations between the Organization of the Petroleum Exporting Countries (“OPEC”) and the non-OPEC members to agree on the oil production cut at their summit in Vienna on the 05th of March 2020, as described in the box above. The mechanics behind the price drop, however, are primarily driven by: i) significant oversupply of crude oil; ii) significantly reduced demand for oil due to COVID-19 impacts and lockdowns; and iii) concerns about storage capacity for crude oil in the U.S.

2.2.4 CREDIT DEFAULT SWAPS

In the first quarter of 2020, the combination of the COVID-19 pandemic and the Saudi Arabia / Russia oil-price war led to increased economic uncertainty. The broad market volatility drove increased demand for credit protection resulting in a dramatic surge of trading in on-the-run index instruments, driving record levels of CDS notional cleared including record buy-side volume. The CDS market observed extreme CDS market realizations and a period of severely increased CDS risk premia followed by period of decreased risk premia. The most extreme realizations (i.e., CDS high yield and investment grade indices) exceeded the analogous observations during the Lehman Brothers period. The relative spread widening and tightening realizations are 2x+ of the ones observed during the GFC. The first quarter reconfirmed the importance of CDS and CDS clearing, offering participants a way to manage their risks against cash markets that today, remain largely inefficient. In Q1 2020, ICE Clear Credit cleared approximately \$7.5 trillion notional amount of CDS instruments, the greatest amount of any quarter in its history.

¹⁸ “Exclusive: Russia to OPEC – deeper oil cuts won’t work”; Reuters; 11th of March 2020; Accessed: 28th of June 2020;

(<https://www.reuters.com/article/us-oil-opec-russia-exclusive/exclusive-russia-to-opec-deeper-oil-cuts-wont-work-idUSKBN20Y2TJ>)

¹⁹ “Oil Plunges Most Since 1991 After Producers Embark on Price War”; Bloomberg; 09th of March 2020; Accessed: 28th of June 2020;

(<https://www.bloomberg.com/news/articles/2020-03-08/oil-in-freefall-after-saudis-slash-prices-in-all-out-crude-war>)

²⁰ “OPEC+ Moves To End Price War With 9.7 Million B/D Cut”; Journal of Petroleum Technology; 13th of April 2020; Accessed: 28th of June 2020;

(<https://pubs.spe.org/en/jpt/jpt-article-detail/?art=6871>)

²¹ “Why oil prices just crashed into negative territory”; MarketWatch; 21st of April 2020; Accessed: 28th of June 2020;

(<https://www.marketwatch.com/story/why-the-oil-market-just-crashed-below-0-a-barrel-4-things-investors-need-to-know-2020-04-20>)

3. OPERATIONS

A robust and reliable operations environment is critical in times of market stress, as participants tend to trade and clear more in order to effectively and efficiently manage their risks in light of the changing market conditions. This is further highlighted in Subchapter 3.1, where we observe, that during the CC, clearing volumes reached new record highs. Especially in turbulent times, it is critical that the daily routine of a CCP includes steps to manage the risk of its markets and detect potential risks to the financial markets early. During the CC, these processes were reliably executed, thus allowing CCPs to provide further stability and safety to the financial market. CCPs have set up various daily processes that are designed to ensure safe and robust financial markets, particularly in periods of stress. These may vary among CCPs, but generally include, and are not limited to^{22,23}:

- Netting and risk offsetting by multilateral clearing;
- Calculation and evaluation of VM and IM requirements;
- Collection and payment (i.e. settlements) of VM;
- Stress tests to validate the adequacy of financial resources to cover a CM default event (e.g., “cover 2” requirement);
- Calculation of haircuts on deposited collateral;
- Safekeeping of margin and investment of the cash held;
- Risk monitoring, including interest risk rate;
- Monitoring of the compliance with applicable requirements, restrictions and limits; and
- Issuing of daily reports regarding transactions, modifications and exposure components.

During the CC, CCPs remained fully operational, while offering robust marketplaces and central clearing services. Market stakeholders, including CCPs and market participants, recognize the importance of markets remaining open, in order to allow market participants to continue to effectively and efficiently manage their risks.^{24, 25, 26, 27} Not only did the markets remain open but trading and clearing was uninterrupted, no CCP12 member was materially delayed or unable to function. On the contrary, some CCP12 members even extended their clearing system availability hours for a specific time period, in order to assist market participants with managing the overall load within operations.²⁸

²² “Post-trade risk control”; Eurex Clearing; 28th of June 2020; Accessed: 28th of June 2020; (<https://www.eurexclearing.com/clearing-en/risk-management/system-based-risk-controls/post-trade-risk-control>)

²³ “Functional Definition of a Central Counterparty Clearing House (CCP)”; ESMA; 28th of June 2020; Accessed: 28th of June 2020; (<https://www.esma.europa.eu/file/5752/download?token=1lcjakov>)

²⁴ “Nasdaq Statement on Nordic and Baltic Operations”; Nasdaq; 23rd of March 2020; Accessed: 28th of June 2020; (<https://www.nasdaq.com/press-release/nasdaq-statement-on-nordic-and-baltic-operations-2020-03-23>)

²⁵ “Keeping the marketplace available and accessible for you”; SGX; 28th of June 2020; Accessed: 28th of June 2020; (<https://www.sgx.com/keeping-marketplace-available-and-accessible-you>)

²⁶ “CME Group Statement on U.S. Treasury Secretary Mnuchin Proposal to Shorten Trading Hours”; CME Group; 17th of March 2020; Accessed: 28th of June 2020; (https://www.cmegroup.com/media-room/press-releases/2020/3/17/cme_group_statementonustreasurysecretarymnuchinproposaltoshorten.html)

²⁷ “FIA joins trade associations and businesses to urge Trump Administration and Federal officials to keep markets open”; FIA; 20th of March 2020; Accessed: 28th of June 2020; (<https://www.fia.org/resources/fia-joins-trade-associations-and-businesses-urge-trump-administration-and-federal>)

²⁸ “Nasdaq Clearing Extension”; Nasdaq; 20th of March 2020; Accessed: 28th of June 2020; (<https://newsclient.omxgroup.com/cdsPublic/viewDisclosure.action?disclosureId=929511&lang=en>)

Case Study: Closure of Philippine financial market

On 17th of March 2020 – after the order of widening the ongoing community quarantine – the Philippine Stock Exchange (“PSE”) did shut down the stock market in order to ensure the safety of employees and traders²⁹. Two days later, the PSE resumed trading. The Philippines Stock Exchanges Composite Index, a stock market index which tracks the performance of the most representative companies listed on the Philippine Stock Exchange, dropped down by as much as 24% before closing at the lowest level since January 2012, bringing its valuation to the lowest level in 8 years³⁰.



Figure 3: Philippines Stock Exchange Composite Index – 10Y overview

In comparison to this, for example, the German stock index for the equity market – DAX – on 17th of March 2020 fell approximately 500 points (-5.56%), but also gained on 18th of March 2020 again approximately 170 points (+2.00%). On 19th of March it gained a further 320 points (+3.70%), reaching nearly the level from 2 days prior. Furthermore, the S&P 500 lost on 17th of March 2020 131 points (-5.18%), recovered slightly on the next day by gaining 11 points (+0.47%) and decreasing again on 19th of March 2020 with 104 points (-4,34%). The Thailand SET 50 Index - a major stock market index which tracks the performance of all common stocks listed on the Stock Exchange of Thailand – gained on 17th of March 2020 10 points (+1.46%), lost 1 point (-0.17%) on the next day and gained 64 points (+9.27%) on 19th of March 2020. Clearly, during the same time period, participants of the open markets could continue to manage their risks and likely avoided introducing additional volatility that can arise where participants cannot manage their risks in light of volatile market conditions.

Proposals to shorten financial market hours or to even close the financial markets, as suggested by some senior government officials, were heavily opposed by market participants and trade associations: “the [...] financial markets are critical infrastructures [...] and they continue to function as designed despite the volatility caused by the coronavirus”²⁶. Furthermore, “public prices allow millions of consumers and businesses to make rational choices about purchasing, selling, manufacturing and investing throughout the economy”²⁶.

²⁹ “PH stock market shutting down by March 17 until further notice”; Inquirer.net; 16th of March 2020; Accessed: 28th of June 2020; (<https://business.inquirer.net/292714/ph-stock-market-shutting-down-starting-march-17-until-further-notice>)

³⁰ “Philippines Record Plunge Shows Risks of Shuttering Stock Market”; Bloomberg; 19th of March 2020; Accessed: 28th of June 2020; (<https://www.bloomberg.com/news/articles/2020-03-18/after-unusual-halt-traders-antsy-about-philippine-market-reopen>)

3.1 CLEARING VOLUMES

Over the course of the CC, clearing volumes increased extraordinarily. Especially in March 2020, clearing volumes reached record highs. In the asset classes comparison, clearing volumes in agriculture, energy, equity index and precious metals showed the largest increases, as can be seen in Figure 4.

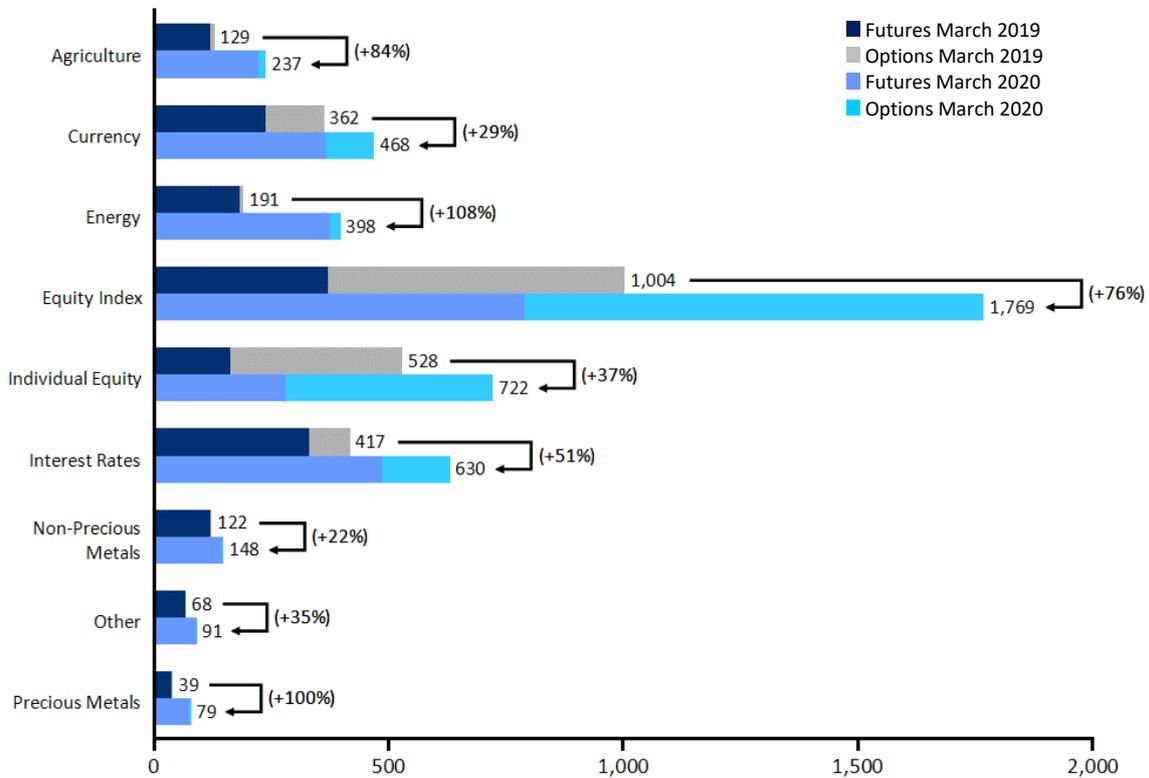


Figure 4: Clearing Volumes by Asset Class March 2019 vs. March 2020 in Millions of cleared trades³¹

Although March 2019 – in comparison to February and April 2019 – was a month with high clearing volumes, March 2020 exceeded these figures even further. Within the equities market, for example total volumes went up by 146%, as shown by the EquityClear contracts of LCH Ltd. and LCH S.A. in Figure 5a below.

³¹ "ETD Volume – March 2020"; FIA; 15th of April 2020; Accessed: 28th of June 2020; (<https://www.fia.org/resources/etd-volume-march-2020>)

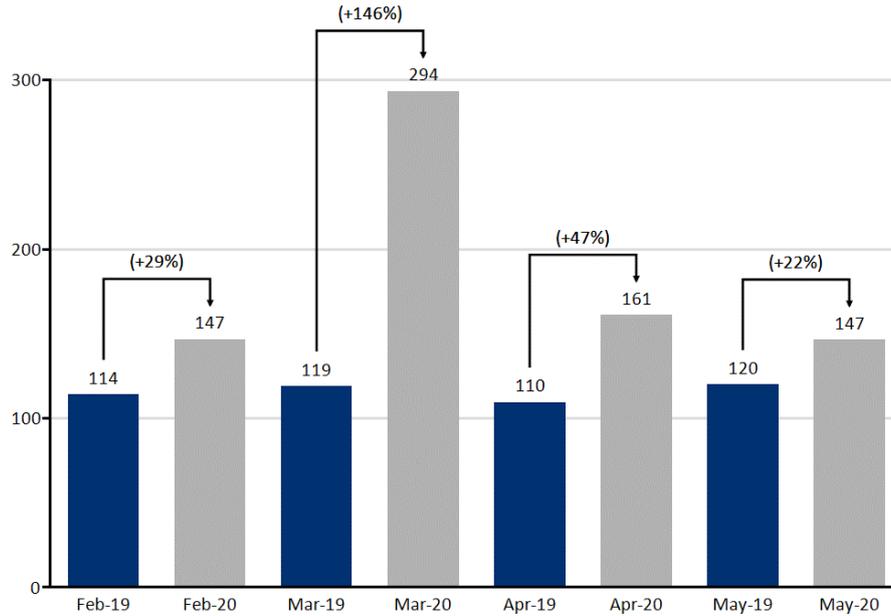


Figure 5a: LCH Ltd. & LCH S.A. EquityClear clearing volume comparison in Millions of cleared trades³²

In April 2020 clearing volumes came down but were still elevated in comparison to April 2019 figures³³, as we can see using the example of The Options Clearing Corporation (“OCC”) in Figure 5b below. April 2020 clearing volumes were 43% higher than in the previous year. In May 2020, clearing volumes at LCH and OCC were back to normal³⁴.

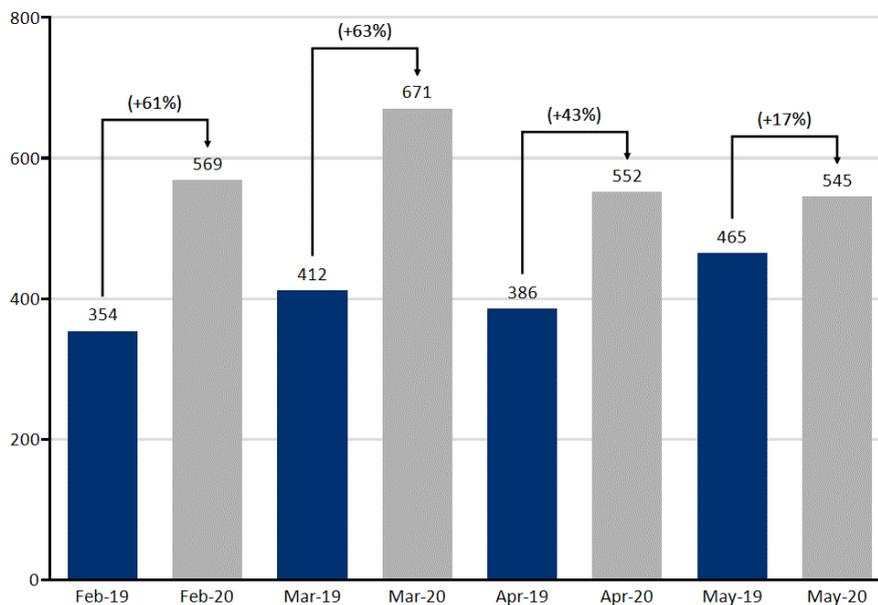


Figure 6b: OCC Futures & Options clearing volume comparison in Millions of cleared trades³⁵

³² Includes EquityClear contracts clearing volumes of LCH Ltd. and LCH S.A.; “Volumes”; LCH Group; 28th of June 2020; Accessed: 28th of June 2020; (<https://www.lch.com/services/equityclear/equityclear-ltd/volumes>) (<https://www.lch.com/services/equityclear/equityclear-sa/volumes>)

³³ “ETD Volume – April 2020”; FIA; 1st of May 2020; Accessed: 28th of June 2020; (<https://www.fia.org/resources/etd-volume-april-2020>)

³⁴ “ETD Volume – May 2020”; FIA; 1st of June 2020; Accessed: 28th of June 2020; (<https://www.fia.org/resources/etd-volume-may-2020>)

³⁵ Includes Futures and Options contracts clearing volumes of OCC; “Volume by Exchange”; OCC; 28th of June 2020; Accessed: 28th of June 2020; (<https://www.theocc.com/webapps/exchange-volume>)

3.2 BUSINESS CONTINUITY PLANS

The continuity of services has always been a cornerstone of the CCP offering and consistently considered in CCPs' processes and planning to provide for business continuity in times of stress. These processes are appropriately tailored to the different characteristics of CCPs. However, after various acts of terrorism, virus outbreaks and natural disasters, international financial authorities and industry participants recognized the opportunity in 2005 to set up international standards for Business Continuity Management ("BCM"). These resulted in the 2006 "High-Level Principles for Business Continuity"³⁶ published by – amongst others – the Financial Stability Board ("FSB"), the Basel Committee on Banking Supervision ("BCBS") and CPSS-IOSCO. The principles give guidance on the set up and testing of BCP as well as on board and senior management responsibilities and recovery objectives.

Additionally, CPMI-IOSCO included in 2012 in their PFMI under Principle 17: Operational Risk revised guidance on BCPs:

"An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a widescale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements."³⁷

CCPs around the globe have set up BCPs in order to prepare for different types of events that could disrupt their operations, which are tailored according to their needs and can be implemented to minimise or negate any impact on business services. Consistent with the PFMI, the BCP shall also be tested on a regular basis. Due to this reason, CCPs conduct different types of testing exercises with only their CMs and clients or together with other exchanges or CCPs or in an industry-wide exercise that includes various market participants – exchanges, CCP, CMs and non-CMs³⁸.

In this paper, we only want to highlight one area within the BCP, namely the usage of different working environments, as these were needed foremost in the CC due to physical distancing and lockdown rules of governments.

³⁶ "High-level principles for business continuity"; BIS; August 2006; Accessed: 28th of June 2020; (<https://www.bis.org/publ/joint17.pdf>)

³⁷ "Principles for financial market infrastructures"; BIS; April 2012; Accessed: 28th of June 2020; (<https://www.bis.org/cpmi/publ/d101a.pdf>)

³⁸ "Disaster recovery: FIA holds annual test"; FIA; 31st of January 2014; Accessed: 28th of June 2020; (<https://www.fia.org/articles/disaster-recovery-fia-holds-annual-test>)

3.2.1 WORKING ENVIRONMENT – DIFFERENT ARRANGEMENTS

In the CC, our CCP12 members have applied different working environment scenarios as advised on the respective homepages in some cases:

- **Work from the normal office:** Only employees, working in areas that are critical for the ongoing market functions as defined in the BCP, such as technology, operations or surveillance, are asked to work from the office. The number of staff present were however reduced to a minimum. Hygienic and distancing protocols were implemented and respected at all times, including measures such as temperature checks and wearing face masks.
- **Work from back-up locations / secondary sites:** In order to avoid crowded offices, some CCP12 members asked their employees to work from back-up locations or secondary sites and to keep the number of employees in one room or office to a minimum.
- **Work from home:** Many employees have been asked to work from their respective homes to fulfil the physical distancing rules whilst respecting all necessary system security protocols.

On top of different working environment scenarios, CCP12 members additionally implemented further measures to ensure the safety of their employees:

- **Split teams:** Teams were divided by two or three depending on the team size, the importance of the business function and the available working environments. The respective employees were asked to work from the office, from back-up locations / secondary sites or from home.
- **Rotating teams:** The split teams rotate in a timely manner, without having physical contact to the other teams to reduce any risk of cross transmission between the teams or spread into the community.
- **Virtual meetings and events:** Physical CCP-hosted meetings and events were generally cancelled or postponed. Employees did not attend or host external meetings or events. Alternatively, virtual meetings were preferred – including the first ever virtual CCP12 AGM was held in June 2020.
- **Reduction of travelling and travel bans:** In addition to international travel bans, some CCP12 members implemented further travel restrictions.
- **Quarantine:** Employees, who travelled outside of the respective country or to regions at risk, have been asked to work from home for a quarantine period before returning to the office.

3.2.2 PERFORMANCE OF BCPS

Across the board, CCPs were called to implement their BCPs during the CC, in order to ensure the resiliency, availability and stability of the ongoing business and clearing operations, as well as their IT infrastructures. CCPs committed themselves to monitor the evolving situation and adapt measures accordingly. As appropriate, close cooperation with governments, industry bodies, regulators and experienced BCM professionals was established. The BCPs were in some cases also shared with participants, business partners and regulators. In the CC, the interaction between participants and the CCPs was not interrupted, even where employees were consistently working from home. CCPs reliably demonstrated the success of their BCPs, which had to be implemented as a result of coronavirus.

Furthermore, the fact that the availability of the CCPs was unchanged during the CC can be seen by looking at the Public Quantitative Disclosures (“PQD”) for Q1 2020. These PQDs^{39, 40} are published on a quarterly basis. Disclosure 17.2.1 shows the *Actual Availability Of The Core System(s) Over The Previous Twelve Months*. The actual availability in unstressed times can be seen when looking at the Q4 2019 figures in Table 2, which shows the actual availability data from the 1st of January 2019 until the 31st of December 2019. During the CC, CCPs reported an even higher availability for the period from the 1st of April 2019 until the 31st of March 2020.

Public Quantitative Disclosures

In 2015, the CPMI-IOSCO published PQD standards for CCPs as an important component of the set of PFMI public disclosure requirements, while also encouraging CCPs to use a common PQD submission template. CCP12 supports CPMI-IOSCO’s efforts to improve the level of standardization and transparency of the CCP industry; our members collaboratively worked to create a common PQD template in 2015, and officially released the CCP12 PQD Template in 2017.

17.2.1	Q4 2019	Q1 2020
Hong Kong Exchanges and Clearing Limited ⁴¹	99.98%	99.98%
Japan Securities Clearing Corporation	100.00%	100.00%
Eurex Clearing	100.00%	99.95%
LCH ⁴²	99.95%	99.96%
Chicago Mercantile Exchange	100.00%	100.00%
Depository Trust & Clearing Corporation ⁴³	99.94%	99.96%
Intercontinental Exchange, Inc. ⁴⁴	99.99%	99.99%
The Options Clearing Corporation	99.99%	100.00%

Table 2: Comparison of Disclosure 17.2.1 – Q4 2019 vs. Q1 2020

³⁹ “Public quantitative disclosure standards for central counterparties”; BIS; February 2015; Accessed: 28th of June 2020; (<https://www.bis.org/cpmi/publ/d125.htm>)

⁴⁰ “CCP12 PQD Template”; CCP12; 28th of June 2020; Accessed: 28th of June 2020; (<https://ccp12.org/wp-content/uploads/2020/05/The-CCP12-Template-for-Public-Quantitative-Disclosures-for-CCPs-1.xlsx>)

⁴¹ Average 17.2.1 data of Hong Kong Securities Clearing Ltd. (“HKSCC”), HKFE Clearing Corporation Ltd. (“HKCC”), SEHK Options Clearing House Ltd. (“SEOCH”) and OTC Clearing Hong Kong Ltd. (“OTCC”)

⁴² Average 17.2.1 data of LCH Ltd. and LCH S.A.

⁴³ Average 17.2.1 data of Government Securities Division (“GSD”), Mortgage-Backed Securities Division (“MBSD”) and National Securities Clearing Corporation (“NSCC”)

⁴⁴ Average 17.2.1 data of ICE Clear Europe (“ICEU”), ICE Clear Credit (“ICC”), ICE NGX and ICE Clear U.S. (“ICUS”)

In Table 3 below, measures and BCP performances of some of our CCP12 members have also been listed:

CCP12 member	Link
Australian Securities Exchange	Link
Eurex Clearing	Link
Hong Kong Exchanges and Clearing Limited	Link
Intercontinental Exchange, Inc.	Link
KDPW_CCP S.A.	Link
LCH	Link
Nasdaq Clearing AB	Link
New Zealand Clearing and Depository Corporation Limited	Link
TMX Group	Link
The Options Clearing Corporation	Link

Table 3: BCP performances of some CCP12 members

3.3 FINANCIAL RESOURCES

CCPs collect collateral from their CMs to cover the potential futures exposures of their CMs’ portfolios in the form of IM (more information about IM is available in the “CCP12 Primer on Initial Margin”⁴⁵) and DF requirements. These requirements protect a CCP against the future risk exposure in the case a CM defaults. CCPs facilitate the exchange of VM on at least a daily basis, which captures the mark-to-market movements on the value of CMs’ portfolios – e.g., simplistically, a CM portfolio that has declined in value since the last VM collection owes VM that is then paid out by a CCP to a CM portfolio that has increased in value.

While facilitating the exchange of VM on at least a daily basis reduces the accumulation of exposure in the system, by capturing the current value of a CM’s portfolio, IM and DF requirements will vary with different market conditions. Given the extraordinary volatility that was observed during the CC, it is important to recognize the distinct purposes of IM and DF. IM is intended to cover a range of market movements, including those observed in stressed markets, while designed to achieve a 99% coverage standard within the closeout period. Whereas the DF⁴⁶ is a pool of mutualized collateral, which is designed to cover losses exceeding the available margins from a defaulting party under “extreme but plausible market conditions”. Given the purposes and design of IM and DF requirements, it is warranted that a CCP would call for additional IM and observe margin breaches as a result of the extraordinary levels of volatility that were observed during CC, as depicted in Subchapter 2.2. Over the course of the CC, day-over-day CCPs observed consistent increases in volatility, demonstrating the appropriateness of making stepped change increases to IM requirements. Further, while margin breaches are expected, since a 99% coverage standard is targeted, the level of volatility observed could also constitute “extreme but plausible market conditions” in some cases. Additionally, the average VM amounts observed over the course of the CC demonstrated the significant day-over-day mark-to-market movements portfolios were experiencing.

The published PQD data includes details on IM, VM and DF figures. Below we analysed some of our members’ PQD by making a Quarter-over-Quarter (“QoQ”) comparison of Q4 2019 and Q1 2020 figures.

⁴⁵ “CCP12 Primer on Initial Margin – a CCP12 White Paper”; CCP12; 5th of December 2020; Accessed: 28th of June 2020; (https://ccp12.org/wp-content/uploads/2018/12/CCP12_White_Paper_Primer_on_Initial_Margin.pdf)

⁴⁶ Some CCPs use also the term Clearing Fund or Reserve Fund.

3.3.1 INITIAL MARGIN

In Disclosure 6.1.1, CCPs are required to disclose the *Total Initial Margin Required*, as of quarter end. We can see, that the IM Required increased significantly in the QoQ comparison.

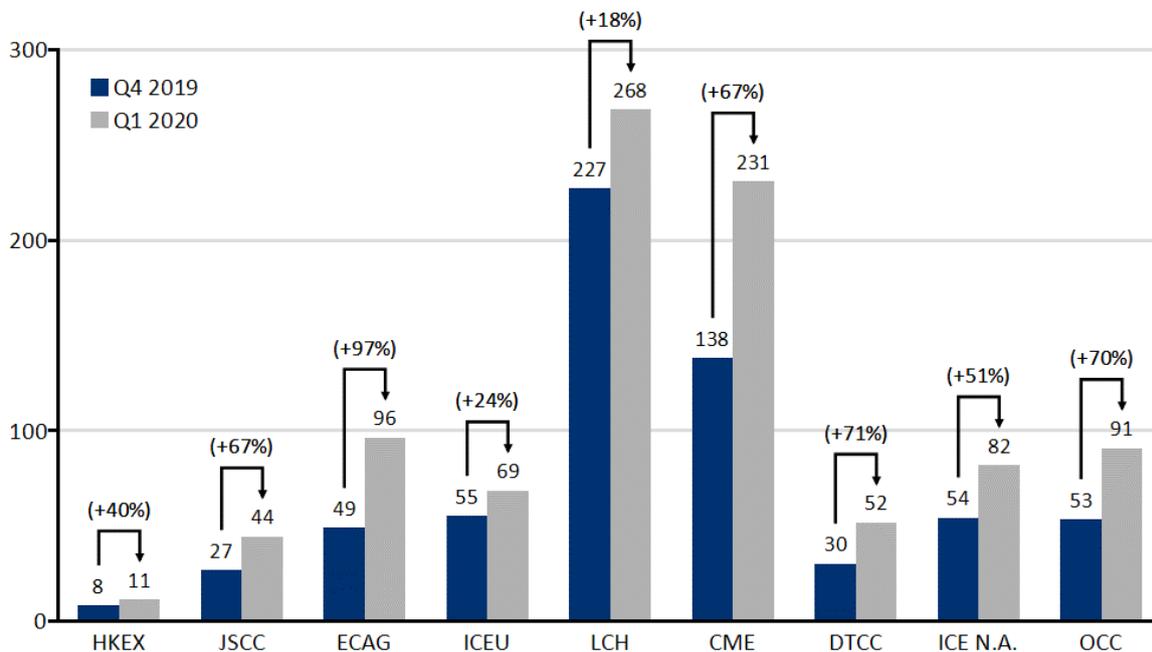


Figure 7: Quarter End Figures Comparison of Disclosure 6.1.1 – Q4 2019 vs. Q1 2020 in bn USD⁴⁷

For the Asian-Pacific (“**APAC**”) region, Hong Kong Exchanges and Clearing Ltd. (“**HKEX**”)⁴⁸ and Japan Securities Clearing Corporation (“**JSCC**”), we saw a 40% and 67% increase, respectively, in total IM required in Figure 6. In comparison to this, the IM required between Q4 2019 than in Q3 2019 changed only minorly at HKEX, about 3% less. At JSCC, the IM required increased only by 3% from Q3 to Q4 2019. Eurex Clearing AG (“**ECAG**”), ICEU and LCH⁴⁹ – three of our members who represent the Europe, the Middle East, and Africa (“**EMEA**”) region – showed QoQ increases of 97%, 24% and 18% respectively in total IM required. Between Q3 2019 and Q4 2019 the IM required at these CCPs changed only minorly, ECAG and ICEU with 1% less, LCH with 5% less. The four shown American CCPs, Chicago Mercantile Exchange (“**CME**”), Depository Trust & Clearing Corporation (“**DTCC**”)⁵⁰, ICE North America (“**ICE N.A.**”)⁵¹ and OCC, all show an increase from Q4 2019 to Q1 2020 of between 51% and 70% in total IM required. For CME we also saw a minor change in IM required in Q4 2019 and Q3 2019 with 5% less. DTCC, ICE N.A. and OCC however, saw an increase – when comparing Q3 2019 with Q4 2019 - in IM required of between 5% and 15%.

Across the board IM increases were observed between Q4 2019 and Q1 2020 quarter end, consistent with the design of margin models which are intended to reflect price movements at a certain confidence interval. In light of the fact that many asset classes had repeated, significant price movements, some of

⁴⁷ Exchange rates of JPY/USD, HKD/USD, CNY/USD, EUR/USD, GBP/USD, CAD/USD as of 31.12.2019 and 31.03.2020; (<https://www1.oanda.com/currency/converter/>)

⁴⁸ HKEX figures include the PQD data of HKSCC, HKCC, SEOC and OTCC

⁴⁹ LCH figures include the PQD data of LCH Ltd. and LCH S.A.

⁵⁰ DTCC figures include the PQD data of GSD, MBSD and NSCC

⁵¹ ICE N.A. figures include the PQD data of ICC, ICE NGX and ICUS

these new observed price moves had to be incorporated into IM calculation to respect the selected confidence interval, while other moves may constitute “extreme but plausible market conditions” that are more appropriately incorporated in a CCP’s DF sizing. That said, the size of the overall IM increases relative to extraordinary volatility observed, including as demonstrated by the VM flows, were relatively muted. This suggests that the anti-procyclical characteristics of CCP margin models worked appropriately. Notably, the increases in IM in Figure 6 show the increase from one quarter end to the next, but these increases also represent to some extent increases in volumes traded⁵² and in practice increases occurred throughout the course of Q1 2020 on an incremental basis. This is designed to ease collateral pressures on market participants, while providing sufficient margin coverage. In comparison, the VM disclosures noted in Subchapter 3.3.2 are provided on a quarter average basis so days with more typical VM flows, as were observed in many cases in the early part of Q1 2020, depress the overall average for Q1 2020. As explained further below, notwithstanding these differences, the changes in VM were quite significant and in many cases exceeded the single observation changes in IM from Q4 2019 to Q1 2020.

Additionally, CMs continued to deposit excess collateral with CCPs, which allows CMs to effectively meet forthcoming margins calls, while also demonstrating the safe haven CCPs can provide during periods of stress (6.2.15 Total IM Held less 6.1.1 Total IM Required). At ECAG, approximately 8bn USD additional in excess collateral was deposited in Q1 2020 than in Q4 2019. 493m USD additional excess in collateral was deposited in Q1 2020 than in Q4 2019 at HKEX. At CME, 5.6bn USD more in excess collateral was deposited in Q1 2020 than in Q4 2019. OCC reports, that nearly 10bn USD in additional excess collateral was deposited in Q1 2020 than in Q4 2019.

In Disclosure 6.5.3, CCPs are required to disclose the *Results Of Back-testing Of Initial Margin - Achieved Coverage Level*, using a one quarter lookback. Although a slight decrease in Q1 2020 compared to Q4 2019 in the coverage level of back-testing results of IM can be seen in Table 4, the coverage is appropriate and, in most cases,, still above the 99% coverage level. While IM requirements are designed to capture a variety of market movements, including stressed ones, it is important to recognize the extreme nature of the volatility observed in the CC, as shown in Subchapter 2.2. This shows that despite the extraordinary volatility, CCPs nevertheless provided sufficient margin coverage and notably, these coverage numbers are taken using observations from only Q1 2020.

⁵² As an illustration, LCH estimates that approximately 50% of IM increases in Q1 2020 were due to the introduction of new positions rather than due to margin parameters.

6.5.3	Q4 2019	Q1 2020
Japan Securities Clearing Corporation ⁵³	99.85%	99.54%
Hong Kong Exchanges and Clearing Limited ⁵⁴	99.90%	99.80%
Eurex Clearing ⁵⁵	99.82%	99.45%
LCH ⁵⁶	99.97%	99.93%
Chicago Mercantile Exchange ⁵⁷	100.00%	99.92%
Depository Trust & Clearing Corporation ⁵⁸	99.43%	98.46%
Intercontinental Exchange, Inc. ⁵⁹	99.94%	99.53%
The Options Clearing Corporation	99.98%	99.96%

Table 4: Comparison of Disclosure 6.5.3 – Q4 2019 vs. Q1 2020

3.3.2 VARIATION MARGIN

In Disclosure 6.6.1, CCPs are required to disclose the *Average Total Variation Margin Paid To The CCP By Participants Each Business Day Over The Quarter*. As shown in the Figure 7, the increase of average VM paid each business day is significant between Q4 2019 and Q1 2020.

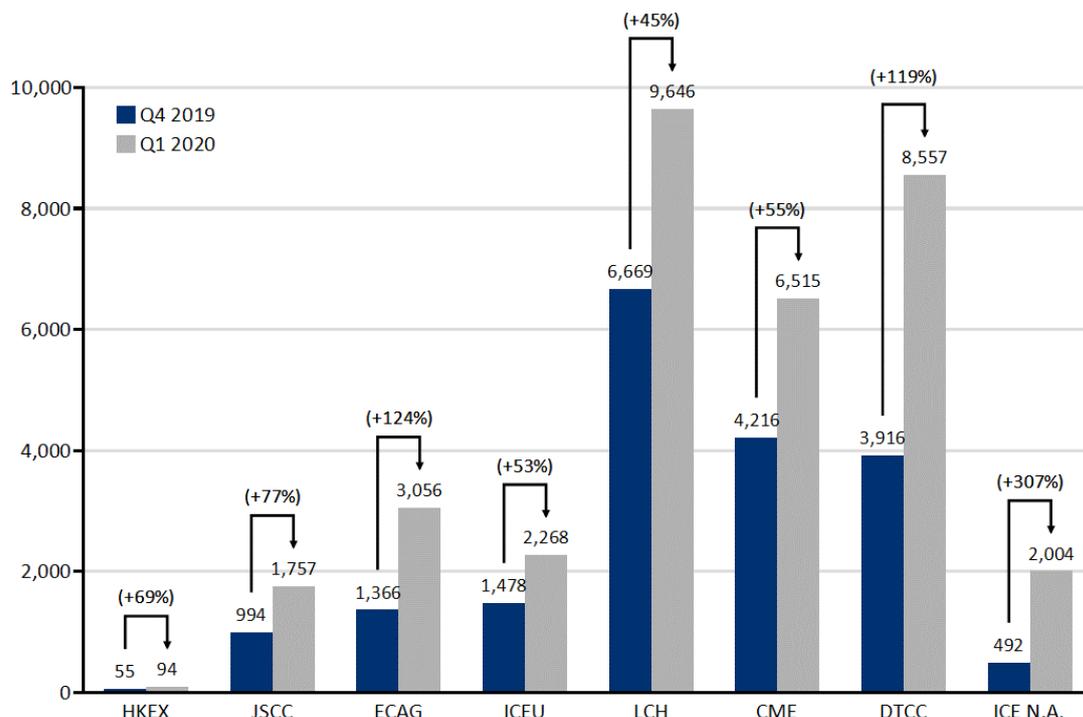


Figure 8: Quarter Average Figures Comparison of Disclosure 6.6.1 – Q4 2019 vs. Q1 2020 in m USD⁶⁰

HKEX and JSCC both show an increase of 69% and 77% respectively. In comparison to this, at HKEX participants had to pay 10% less VM to the CCP in Q4 2019 than in Q3 2019. At JSCC, however, participants

⁵³ Average of services offered by JSCC

⁵⁴ Average of services offered by HKSCC, HKCC, SEOCH and OTCC

⁵⁵ Average of services offered by ECAG

⁵⁶ Average of services offered by LCH Ltd. and LCH S.A

⁵⁷ Average of services offered by CME Base and CME IRS

⁵⁸ Average of services offered by GSD, MBSD and NSCC

⁵⁹ Average of services offered by ICE

⁶⁰ HKEX figures include PQD data of HKSCC, HKCC, SEOCH and OTCC; LCH figures include PQD data of LCH Ltd. and LCH S.A.; DTCC figures include data of GSD, MBSD and NSCC; ICE N.A. figures include the PQD data of ICC, ICE NGX and ICUS; Exchange rates of JPY/USD, HKD/USD, CNY/USD, EUR/USD, GBP/USD, CAD/USD as of 31.12.2019 and 31.03.2020; (<https://www1.oanda.com/currency/converter/>)

had to pay 12% more VM in Q4 2019 than in Q3 2019. In the EMEA region, at ECAG, the VM paid increased even to above 100%, whilst at ICEU and LCH the VM paid increased by around 50%. The CCPs collected less VM – between minus 10% and minus 39% respectively – in Q4 2019 than in Q3 2019. At CME, the VM paid is increased by 55%, at DTCC an increase in Q1 2020 of nearly 120% can be seen in comparison to Q4 2019 and ICE N.A. shows an increase of 307%. CME, DTCC and ICE N.A. collected also less VM in Q4 2019 than in Q3 2019 (minus 23%, minus 26% and minus 5% respectively). The significant VM increases demonstrate the severe day-over-day mark-to-market movements portfolios were experiencing, as would be expected given the levels of volatility. Notably, while the percentage increases in Figure 6 for IM capture quarter end changes, Figure 7 captures differences between average day-over-day changes in VM observed in Q4 2019 and Q1 2020. Thus, notwithstanding the natural dampening effect average calculations have in a rapidly changing market conditions, as occurred over Q1 2020, the increase in the average VM in many cases still exceeded the end of quarter observations included in the IM disclosures. This truly exhibits how large the observed VM amounts were relative to the IM changes during the CC.

The increases of VM can also be seen in the figures below. In Figure 8, the blue line shows the price development of the 10yr Treasury Note Front Month Future. The red bars show the absolute price changes in USD, which represents the VM increases. The black bars show the IM increases. During the 2-month time period, IM is only slightly increased 6 times. This shows that IM increases were not only made in a step-change manner, but that IM requirements were already at a relatively conservative margin level before the CC. This, along with Figure 9, as well as the overall increases depicted in Figure 7, demonstrate IM increases are comparatively small compared to VM changes. The increased VM flows are in part a direct result of the market volatility observed. The exchange of VM also exists in the bilateral world under the Uncleared Margin Rules. VM is not an added cost to market participants in the central clearing model, but rather a concrete layer of protection where CCPs serve as a facilitator of the VM exchange between counterparties.

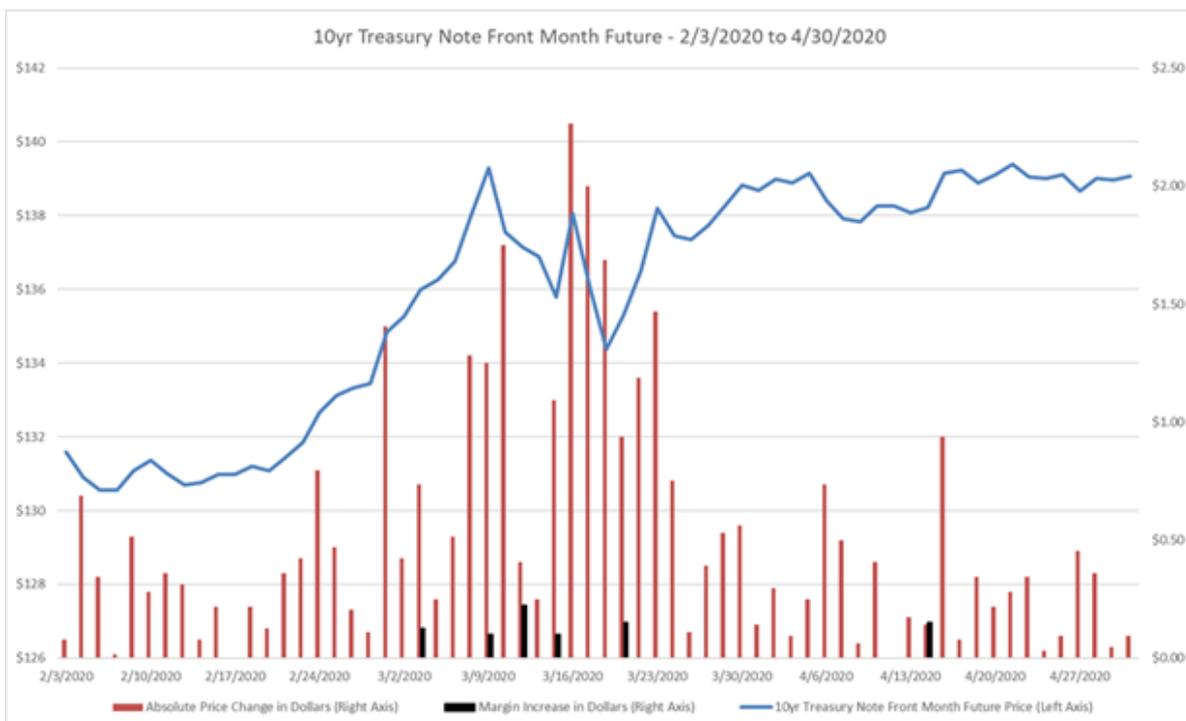


Figure 9: 10yr Treasury Note Front Month Future

A similar picture can be seen in Figure 9, below. Again, the orange line shows the price development, the dark blue bars show the VM increases and the light blue bars the IM increases. Although, here the IM increases more often, the amounts are still comparatively small to the VM increases.

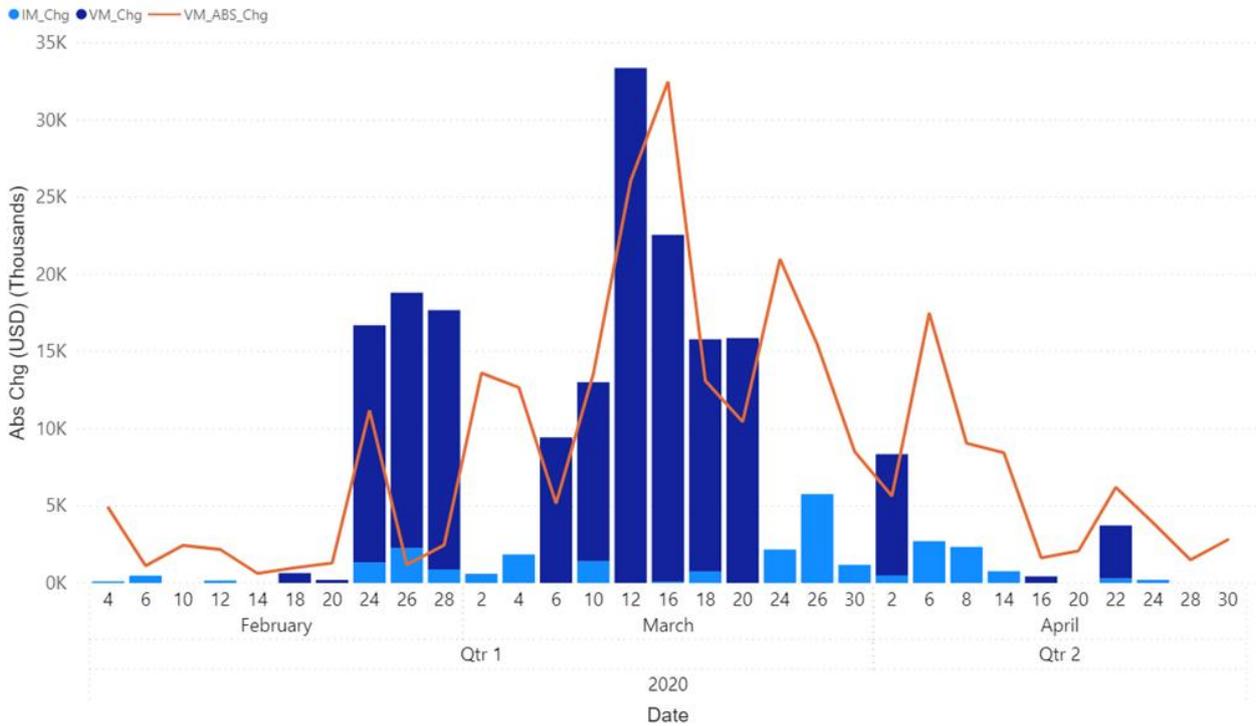


Figure 10: S&P 500 Assuming 100 Contracts

3.3.3 DEFAULT FUND

In Disclosure 4.1.4, CCPs are required to disclose the *Total Value Of Pre-Funded Default Resources*, as of quarter end. Most of the CCPs shown in Figure 10 had an increase in the DF. Some showed only a relatively minor increase, such as CME, ICEU, ICE N.A., JSCC and OCC. LCH’s DF decreased by 5%. ECAG’s and HKEX’s DF increased both by 29%. The increase at DTCC however, was largest with 71%.⁶¹ In comparison to this, the DF increased only minorly (up to 12%) at JSCC, ECAG, ICEU, LCH, CME, DTCC and ICE N.A. from Q3 2019 to Q4 2019, whereas it decreased at HKEX and OCC.

⁶¹ This reflects the change in subsidiaries’ Clearing Funds which in the aggregate across all CM also operates as each subsidiaries default fund.

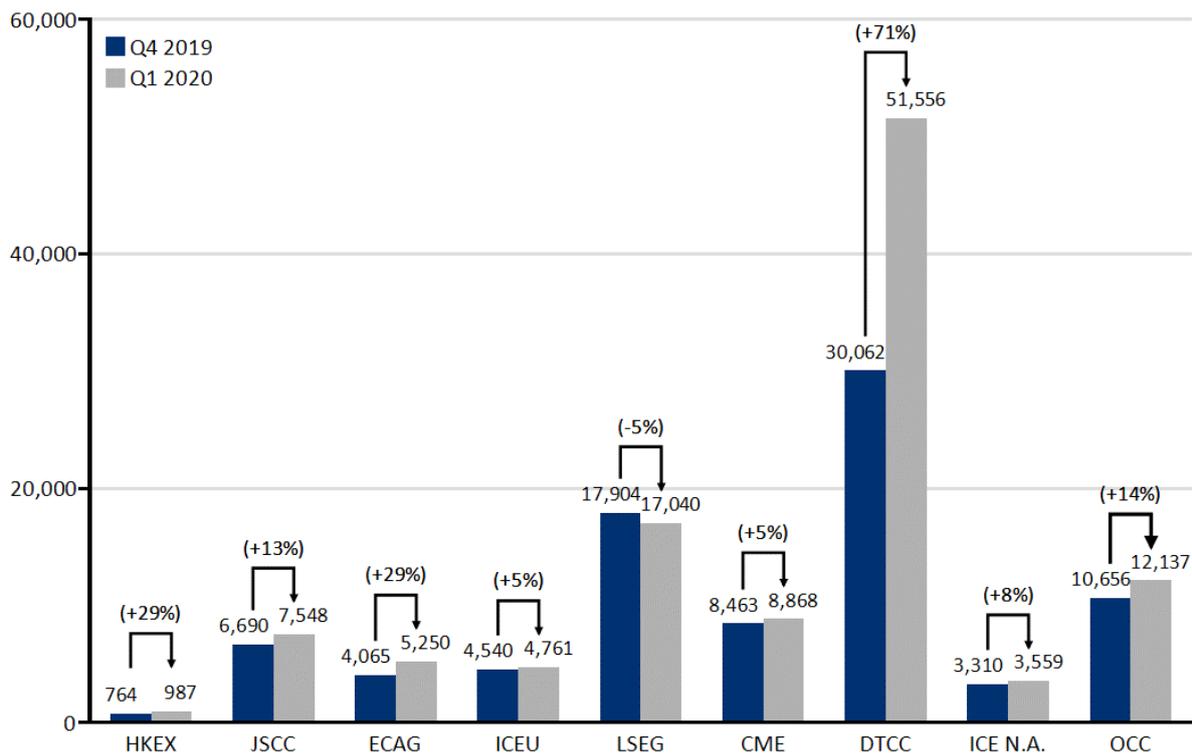


Figure 11: Comparison of Disclosure 4.1.4– Q4 2019 vs. Q1 2020 in m USD⁶²

Additionally, the CCPs included in our analysis reported⁶³, that in Q1 2020 – the same is true for Q4 2019 - on no business day in the quarter, the qualifying liquid resources were exceeded (Disclosure 7.3.2). This is another demonstration that the liquidity risk management of the CCPs are well designed and hold up even when extreme volatility presents itself.

In Disclosure 4.4.3, CCPs are required to disclose the *Estimated Largest Aggregate Stress Loss That Would Be Caused By The Default Of Any Single Participant And Its Affiliates In Extreme But Plausible Market Conditions*. We looked at the mean average over the previous 12 months and overall, only a minor increase (up to +11%) in the estimated largest stress loss can be seen, such as at ECAG, CME and DTCC. HKEX, JSCC and OCC however show a minor decrease (up to minus 4%) over the quarters.

In Disclosure 4.4.7, CCPs are required to disclose the *Estimated Largest Aggregate Stress Loss That Would Be Caused By The Default Of Any Two Participants And Its Affiliates In Extreme But Plausible Market Conditions*. Again, we looked at the mean average over the previous 12 months and here a similar picture is shown. While ECAG, CME and DTCC show a minor increase, HKEX, JSCC and OCC show a minor decrease.

3.3.4 COLLATERAL

In Disclosure 5.3.4, CCPs are required to disclose the *Number Of Days During The Lookback Period On Which The Fall In Value During The Assumed Holding / Liquidation Period Exceeded The Haircut On An Asset*. The lookback period (as disclosed under Disclosure⁶³ 5.3.3) varies among different CCPs and ranges

⁶² HKEX figures include PQD data of HKSCC; HKCC and SEOCH; LCH figures include PQD data of LCH Ltd. and LCH S.A.; DTCC figures include data of GSD, MBSD and NSCC; ICE N.A. figures include the PQD data of ICC, ICE NGX and ICUS; Exchange rates of JPY/USD, HKD/USD, EUR/USD, GBP/USD, CAD/USD as of 31.12.2019 and 31.03.2020; (<https://www1.oanda.com/currency/converter/>)

⁶³ CME, DTCC, ECAG, HKEX, ICEU, ICE N.A., JSCC and OCC

from 1 year up to more than 10 years. In Q1 2020 – as can be seen in Table 5 – the coverage levels of 99% is still fulfilled although a light decrease was reported for some services.

5.3.4	Look-back Period	Q4 2019	Q1 2020
Hong Kong Exchanges and Clearing Limited	5 years	99.89%	99.89%
Japan Securities Clearing Corporation ⁶⁴	250 business days	100.00%	100.00%
LCH Ltd.	1 year	100.00%	100.00%
LCH S.A.	540 days	100.00%	100.00%
Chicago Mercantile Exchange – U.S. Treasuries	4 years	100.00%	99.86%
Chicago Mercantile Exchange – Foreign Sovereign Debt	4 years	100.00%	99.86%
Chicago Mercantile Exchange – Cash Non-G4	4 years	100.00%	99.93%
Chicago Mercantile Exchange – Corporate Bonds	4 years	100.00%	99.18%
Chicago Mercantile Exchange – Stock/ETF	4 years	100.00%	99.93%
Depository Trust & Clearing Corporation - Treasury	10+ years	99.56%	99.40%
The Options Clearing Corporation	2 years, 5 years, 10 years	100.00%	99.32% 99.73% 99.86%

Table 5: Comparison of Disclosure 5.3.4 – Q4 2019 vs. Q1 2020

3.3.5 BALANCE BETWEEN PROCYCLICALITY AND MARGIN PROTECTION

The risk management practices, particularly margining, of CCPs have once again in the CC been tested and proven to be well set. As we explain in Subchapter 3.3.1 changes to the IM levels were executed in a manner that is designed to mitigate procyclical impacts, while maintaining appropriate protection in light of the extraordinary levels of persistent volatility day-over-day. In contrast, CCPs observed significant VM amounts to account for the large swings in portfolios current values, as exemplified in Subchapter 3.3.2. As noted by the Bank of England (“BoE”), “the peak one-day increase in initial margin was considerably smaller than peak one-day variation margin flows through the crisis. This was in part due to prudent measures taken by CCPs before the crisis to prevent initial margin from falling too far in good times and prevent large or unexpected step changes in initial margin requirements when market volatility starts to rise.”⁶⁵

Nevertheless, CCPs are required – as explained in Chapter 3 – to calculate and evaluate the VM and IM requirements on a daily basis. While doing so, CCPs need to find a balance between managing procyclicality and maintaining margin protection, especially in times of stress, as they did during the CC, in order to mitigate the counterparty risk. CMs and NCMs on the other hand need to have sufficient funds to balance these IM and VM requirements in volatile markets. The BoE acknowledges this and states “...given that clearing and margining are important risk mitigants in the system, the answers may lie more in ensuring that that financial market participants [...] understand how margin call can evolve in a stress and have the resilience to manage the consequent liquidity pressures”⁶⁵.

⁶⁴ For categories of collateral with actual deposits, in the Cash Securities, JGB & INDEX F&O, CDS, and IRS clearing services.

⁶⁵ “Financial System Resilience: Lessons from a real stress”; BoE; 09th of June 2020; Accessed: 28th of June 2020; (<https://www.bankofengland.co.uk/-/media/boe/files/speech/2020/financial-system-resilience-lessons-from-a-real-stress-speech-by-jon-cunliffe.pdf?la=en&hash=68025EDB90D936B24560429761646BF4E2D2D74>)

3.4 SUSPENSIONS

Despite the extreme volatility, CCPs remained robust and resilient in the CC, as they did during the GFC. Amongst CCP12 members only one suspension was noted: Ronin Capital LLC, a CM at the CME and the subsidiary of DTCC, the Fixed Income Clearing Corporation (“FICC”).

Ronin Capital LLC, a Chicago based proprietary trading firm, failed to meet its capital requirements during the week of the 16th of March 2020. Consequently, CME announced on the 20th of March 2020 that Ronin Capital LLC’s portfolios cleared by CME were successfully auctioned off⁶⁶. CME was able to resolve the suspension with no impact to CME’s guaranty fund, nor were there any customers or CMs of CME impacted.⁶⁷

Also, FICC reported on the 25th of March, after suspending Ronin Capital LLC already on the 20th of March 2020⁶⁸, that the “liquidation process for the positions of Ronin Capital LLC [...] has been completed”⁶⁹. FICC was able to wind-down and liquidate Ronin Capital LLC’s cash positions without any impact to the DF or the overall Default Waterfall.

As raised in Subchapter 2.1, CCPs safely managed the GFC, although the defaults and suspensions were much more severe than the Ronin Capital LLC suspension during the CC. And despite the fact that local regulations to implement the PFMI that enhanced the resiliency of CCPs were not yet adopted, during the GFC, CCPs not only managed the Lehmann Brothers default, but also the stress events originated by the American International Group, Inc. (“AIG”), an American multinational finance and insurance corporation. Due to previous major losses and a poor risk management, AIG had to be bailed out by the federal government as its failure would have endangered the financial integrity of other major financial market participants (Mermod, 2014, p. 127).⁷⁰

⁶⁶ “CME Group Statement on Ronin, LLC”; CME; 20th of March 2020; Accessed: 28th of June 2020; (https://www.cmegroup.com/media-room/press-releases/2020/3/20/cme_group_statementonroninllc.html)

⁶⁷ “SEC Filing”; CME; 20th of March 2020; Accessed: 28th of June 2020; (<http://investor.cmegroup.com/node/45166/html>)

⁶⁸ “Service update – Ronin Capital LLC”; DTCC; 20th of March 2020; Accessed: 28th of June 2020; (<https://www.dtcc.com/-/media/Files/pdf/2020/3/20/GOV857-20.pdf>)

⁶⁹ “Membership Updates – Completion of Ronin Capital LLC liquidation”; DTCC; 25th of March 2020; Accessed: 28th of June 2020; (<https://www.dtcc.com/-/media/Files/pdf/2020/3/25/GOV864-20.pdf>)

⁷⁰ Mermod, Asli Yüksel; Idowu, Samuel O. “Corporate Social Responsibility in the Global Business World”; Berlin: Springer, 2014

4. CONCLUSION

4.1 SUMMARY

CCPs performed exceptionally in the CC, as they did in the GFC. Despite the extraordinary volatility, as arose in the CC, CCPs managed without any losses or disturbances to local or global financial markets. Clearing volumes reached new all-time highs, but this did not hinder CCPs' operations. BCPs had to be implemented for extended periods, but still the resiliency, availability and stability of the ongoing business and clearing operations, as well as their IT infrastructures, was achieved. Some CCPs even reported a higher actual availability of the core systems than in the previous quarter. IM was increased at an appropriate level in an incremental manner, in order to provide coverage levels of IM back-testing results that were in most cases above 99%. In stark contrast, the observed increases in VM were significant reflecting the large daily price swings observed in the market. And although the DF in some cases also increased, this was measured, appropriate, and predictable with the transparent DF methodologies. Ultimately, CCPs found a balance between managing procyclicality and maintaining margin protection in order to mitigate the counterparty risk. Finally, only one minor suspension amongst CCP12 members was noted, and was solved with no impact on the DF of the affected CCPs, nor were there any other CMs or NCMs impacted.

In the last decade after the GFC, many regulatory enhancements concerning CCPs and their risk management practices were implemented, further increasing the resilience of CCPs after successfully managing the GFC. With these enhancements in place, CCPs coped with the extreme volatility levels and higher clearing volumes than were observed during the CC without any problems. CCPs are a critical component of supporting financial markets, providing financial markets with resilience, safety and stability by offering market participants an effective and efficient place to manage their risks.

Lastly, we believe, that global cooperation is key to facing global challenges such as the CC. Our CCP12 members have worked cooperatively throughout the CC and recognize the importance of regulators and international standard setters doing the same to ensure the resilience and stability of the global financial markets.

4.2 WAY FORWARD

For the future, we need to continue to ensure that the financial markets should stay open, especially in a crisis. The implications of a market closure would be too severe for the local and the global financial markets and economies.

CCPs, as they do today, must continue to review their margin models, stress testing methodologies and default management protocols in order to be prepared for the next crisis. While CCPs' practice held up well during the CC, we recognize the importance of CCPs' enhancing their risk management practices, as appropriate, to address evolving market conditions. CCPs must maintain the flexibility to make these enhancements, leveraging their risk management expertise.

In order to reduce the exposure to the credit risk of the CCP, CCPs should be able to – in times of stress, such as this CC, and even without a banking license – (local or foreign) deposit some of their cash in central

bank accounts. This could allow CCPs to deposit funds, as this could enhance a CCPs' collateral management. Generally, CCPs are dependent on commercial banks and the repo markets for liquidity.^{71,72} The International Monetary Fund ("IMF") supports this way forward in its "Euro Area Policies Financial System Stability Assessment Report"⁷¹ which was released in June 2018.

⁷¹ "Euro Area Policies : Financial System Stability Assessment"; IMF; 19th of July 2018; Accessed: 28th of June 2020; (<https://www.imf.org/en/Publications/CR/Issues/2018/07/19/Euro-Area-Policies-Financial-System-Stability-Assessment-46100>)

⁷² "CCP Conundrums"; LCH Group; 28th of June 2020; Accessed: 28th of June 2020; (https://www.lch.com/index.php/system/files?file=media_root/CCP%20Conundrums.pdf)

5. ABOUT CCP12

CCP12 is a global association of 37 members who operate more than 60 individual CCPs globally across EMEA, the Americas, and APAC regions.

CCP12's mission is to promote effective, practical and appropriate risk management and operational standards for CCPs to ensure the safety and efficiency of the financial markets it represents. CCP12 leads and assesses global regulatory and industry initiatives that concern CCPs to form consensus views, while also actively engaging with regulatory agencies and industry constituents through consultation responses, forum discussions and position papers.

For more information please contact the office by e-mail at office@ccp12global.com or through our website by visiting www.ccp12.org

6. CCP12 MEMBERS

