



ANNUAL MARKETS REVIEW IN CENTRAL COUNTERPARTY CLEARING

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A CCP12 REPORT

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CCP12

MESSAGE FROM THE CHAIRMAN

Compared to 2020 and the impact of COVID-19, 2021 was marked by political and economic challenges. The year was characterised by a mixed picture of macro trends – decreasing unemployment, rising equity and commodity markets in much of the world, and increasing inflationary pressure.

Notwithstanding the unique and volatile events of 2021, the risk management models and practices of clearing houses around the world successfully risk managed counterparty credit risk and mitigated systemic risk.

In addition to disciplined, transparent, and regulated counterparty credit risk management, Central Counterparties (“CCPs”) continued to provide carefully designed collateral management, safe and reliable payment processes and publicly available rulebooks, Principles for Financial Market Infrastructures (“PFMI”) disclosure frameworks, and quantitative disclosures.

In contrast, the Archegos Capital Management incident exposed challenges in the over-the-counter (“OTC”) markets around consistent risk management, margin practices, and transparency that can present risk to the financial markets generally and potentially indirectly to CCPs.

Consistent with our mission, The Global Association of Central Counterparties (“CCP12”) looks forward to 2022 and working closely with market participants and regulators in order to promote the transparency, safety, and efficiency of the markets we clear.

This report includes information – available directly and publicly from CCPs themselves as well as compiled by CCP12 – which details how system reliability and confidence interval targets fared throughout last year.

The extensive level of transparency that CCPs provide in reports, disclosures, engagement with clients, clearing members (“CMs”) and authorities, promotes and fosters confidence and details the protection that comes through choosing cleared markets.



Kevin R. McClear
CCP12 Chairman

MESSAGE FROM THE CEO

It is a great pleasure to bring you our latest Annual Markets Review (“AMR”), where the world’s CCPs are contextualised into the events of the preceding year. As always, the AMR includes statistics that described the wide variety of markets that benefit from central clearing, information on the CCPs themselves, and case studies that bring to life developments from around our planet.

2021 marked an inflection point in many ways, a shift from the post-COVID-19 recovery to growing concern and stress from the heightened political tensions, trade disruptions, and economic pressures. These economic challenges and the corresponding market volatility are in part reflective of our changed international order; the fraying of relations, rise of aggressive or nationalistic foreign policy, and macro-economic difficulties faced across countries both large and small. The most notable tragedy, but by no means the only one, is the illegal and unprovoked new Russian invasion of the Ukraine.

Prior to the added stress from such actions on energy, agriculture, FX, and other markets this year, 2021 already saw the beginning of trends which are gaining momentum this year. Inflation and rates began rising in 2021, especially in smaller currency jurisdictions. Esoteric or novel corners of finance have also felt the impact – and a staggering 2 trillion USD is estimated to have been lost in “value” across crypto, Distributed Ledger Technology and digital assets during the last 3 months.

In such circumstances, the ongoing operational resilience and reliable risk management delivered by the clearing eco-system is essential to maintaining fair and transparent markets, enabling participants to price and settle those risks they wish or need to exchange. In this respect, 2021 marks another successful year for the industry, and I commend the market participants and the CCPs for their excellent performance!

Please enjoy the report and be sure to check out our [Quarterly Trends Report](#) which provides detailed CCP statistics!

Editorial Board: CME, ComDer, CRCC, DTCC, Eurex, ICE, IRGiT, JSCC, JSE Clear, NSE, SGX, SHCH.



Teo Floor
CCP12 CEO

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LIST OF ABBREVIATIONS

AANA	Aggregate Average Notional Amount
ACH	Associated Clearing House
ACL	Achieved Coverage Level
ADV	Average Daily Volume
AMR	Annual Markets Review
APAC	The Asia-Pacific Region
APC	Anti-procyclicality
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
BTC	Bitcoin
CALC	the Clearing Agency Liquidity Council
CC	COVID-19 Crisis
CCP	Central Counterparty
CDS	Credit Default Swap
CDX	Credit Default Swap Index
CFD	Contract For Difference
CFTC	The U.S. Commodity Futures Trading Commission
CHF	Swiss Franc
CM	Clearing Member
CME	Chicago Mercantile Exchange Group
ComDer	Comder Contraparte Central S.A.
COP	Colombian Peso
CPMI	Committee on Payments and Market Infrastructures
CRCC	Camara de Riesgo Central de Contraparte de Colombia SA
CRR	Counterparty Credit Risk
CSA	Credit Support Annex
CSD	Central Securities Depositories
CUSIP	Committee on Uniform Security Identification Purposes
D2C	Dealer-To-Client
D2D	Dealer-To-Dealer
DCO	Derivatives Clearing Organization
DF	Default Fund
DMP	Default Management Process
DTCC	The Depository Trust & Clearing Corporation
DV01	Dollar Value of a Basis Point
EACH	European Association of CCP Clearing Houses
ECAG	Eurex Clearing Group
EMIR	European Market Infrastructure Regulation
EONIA	Euro Overnight Index Average
ESG	Environmental, Social, and Governance
€STR	Euro Short Term Rate
ETD	Exchange Traded Derivative
ETF	Exchange Traded Funds
ETH	Ethereum
ETN	Exchange Traded Notes
ETP	Exchange Traded Product

EU CCP RRR	European Union CCP Recovery and Resolution Regulation
EUR	Euro
FAQ	Frequently Asked Questions
FCH	FX Clearing House
FIA	Futures Industry Association
FIA PTG	FIA Principal Traders Group
FMA	the Financial Markets Act
FMI	Financial Market Infrastructure
FRA	Forward Rate Agreement
FSB	Financial Stability Board
FSCA	Financial Sector Conduct Authority
FTSE	Financial Times Stock Exchange
FX	Foreign Exchange
GBP	Great British Pound/ British Sterling
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GCE	Gross Credit Exposures
GMV	Gross Market Value
HM Treasury	Her Majesty's Treasury
IA	Independent Amount
IBOR	Inter-Bank Offered Rate
ICE	Intercontinental Exchange Inc
ICH	Independent Clearing House
IM	Initial Margin
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
IRD	Interest Rate Derivative
IRGiT	Izba Rozliczeniowa Giełd Towarowych S.A.
IRS	Interest Rate Swap
ISDA	the International Swaps and Derivatives Association
ISIN	International Securities Identification Number
JCCH	Japan Commodity Clearing House
LCH	London Clearing House
LCR	Leverage Coverage Ratio
JEPX	Japan Electric Power Exchange
JFSA	Japan Financial Securities Agency
JPY	Japanese Yen
LHS	Left Hand Side
LIBOR	London Inter-Bank Offered Rate
LNG	Liquefied Natural Gas
JPY	Japanese Yen
JSCC	Japan Securities Clearing Corporation
JSE	Johannesburg Stock Exchange
LSOC	Legally-Segregated-Operationally-Comingled
MAS	Monetary Authority of Singapore
MFA	Managed Funds Association
MoM	Month-on-Month
MPOR	Margin Period of Risk

MPPQD	Market Participant Public Quantitative Disclosures
MRAC	Market Risk Advisory Committee
NAO	Notional Amounts Outstanding
NDF	Non-Deliverable Forward
NDO	Non-Deliverable Options
NPC	the National People's Congress of China
NSCC	The National Securities Clearing Corporation
NSE	National Stock Exchange of India Ltd
NSFR	Net Stable Funding Ratio
OCC	the Options Clearing Corporation
OIS	Overnight Index Swaps
OTC	Over-The-Counter
OTP	One-time-password
P&L	Profit and Loss
PA	Prudential Authority
PFMI	Principles for financial market infrastructures
PQD	Public Quantitative Disclosures
PTS	Proprietary Trading System
QCCP	Qualifying Central Counterparty
QoQ	Quarter-on-Quarter
Repo	Repurchase Agreement
RFR	Risk-Free Rate
RHS	Right Hand Side
RMB	Renminbi
RTS	Regulatory Technical Standards
RWA	Risk Weighted Average
S&P	Standard & Poor's
SARON	Swiss Average Overnight
SDR	Swap Data Repository
SEC	the U.S. Securities and Exchange Commission
SEF	Swap Execution Facilities
SGX	Singapore Exchange
SHCH	Shanghai Clearing House
SIFMA	Securities Industry and Financial Markets Association
SIFMU	Systemically important financial market utility
SIMM	Standard Initial Margin Model
SITG	Skin-in-the-Game
SLD	Supplemental Liquidity Deposits
SOFR	Secured Overnight Financing Rate
SONIA	Sterling Overnight Index Average
SSA	Securities Services Act
SSBs	Standard-Setting Bodies
STM	Settled-To-Market
TEBL	East Area Baseload Electricity
TEPL	East Area Peakload Electricity
TOCOM	Tokyo Commodity Exchange
TONA	Tokyo Overnight Average
TWBL	West Area Baseload Electricity

TWPL	West Area Peakload Electricity
UMR	Uncleared Margin Rules
USD	United States Dollar
VIX	Cboe Volatility Index®
VM	Variation Margin
WAM	Weighted Average Maturity
XCCY Swaps	Cross-Currency Swaps
XVA	X-Value Adjustment
YoY	Year-over-year
YTD	Year-to-date

EXECUTIVE SUMMARY

2021 was yet another interesting period of time for capital markets and the global economy. We observed different trends and the overall economic picture was quite mixed. Two years into the worldwide COVID-19 pandemic (or “COVID Crisis” or “CC”), markets were still strongly influenced by it and its new variants, especially Omicron, as it kept many people and businesses in lockdowns. While unemployment rates remained low and Gross Domestic Product (“GDP”) of all major economies was positive, inflation was a significant concern which triggered a change in the approach of some central banks, resulting in raising interest rates, mainly in the last quarter of the year. 2021 was also very volatile for cryptocurrencies and large price movements in commodities markets were observed, especially in the energy sector. The end of the year was marked by growing geopolitical tensions in Eastern Europe which, as we know at the moment of the publication, developed into a brutal war of Russia against Ukraine.

Interestingly enough, amidst all the uncertainty caused by these tumultuous circumstances, capital markets generally functioned well, enabling price formation and raising capital for businesses to grow. CCPs continued to be a safe haven for market participants. They also expanded the range of products cleared in 2021. CCPs continued to provide robust risk management and transparency to their members and contributed to the markets’ smooth transition to the new Risk-Free Rates (“RFRs”).

Global Standard-Setting Bodies (“SSBs”) and local authorities continued to look at potential ways to improve the functioning and safety of markets and their participants in the form of various consultation papers and proposals for new legislation as described in subsequent chapters. Developments in individual markets and CCPs, related to i.a. licencing, default management practices, and account and segregation models are presented in the case studies written by CCP12 Members: ComDer, CRCC, DTCC, Eurex and SGX, JSCC, JSE Clear, NSE, and SHCH. Reaping the benefits of CCPs’ rich disclosures, a selection of data demonstrating CCPs’ performances and available resources is also provided in this edition of the AMR.

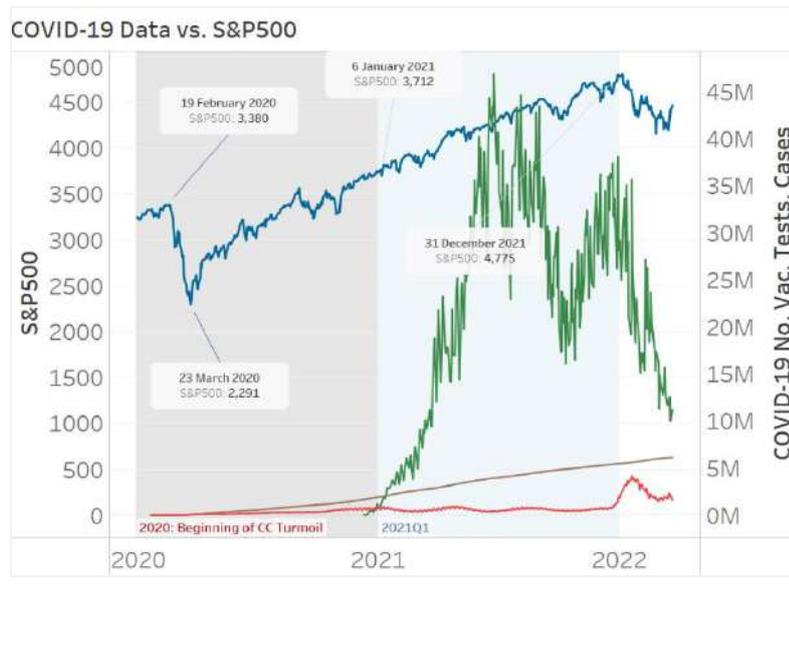
1. GLOBAL ECONOMIC LANDSCAPE

1.1 KEY ECONOMIC INDICATORS, TRENDS, AND SELECTED MARKET EVENTS DURING 2021

2021 was a year marked by a global recovery following the aftermath of the 2020 COVID-19 pandemic and the lingering aftershocks, which we are still experiencing in early 2022. Investment decisions were challenged by the continued uncertainty in particular markets, however stock markets in general remained resilient in 2021, despite rising inflation and the effects of the Omicron variant.

The following sections look at particular areas of our global markets and how they evolved in 2021.

1.1.1 COVID-19 STATISTICS¹



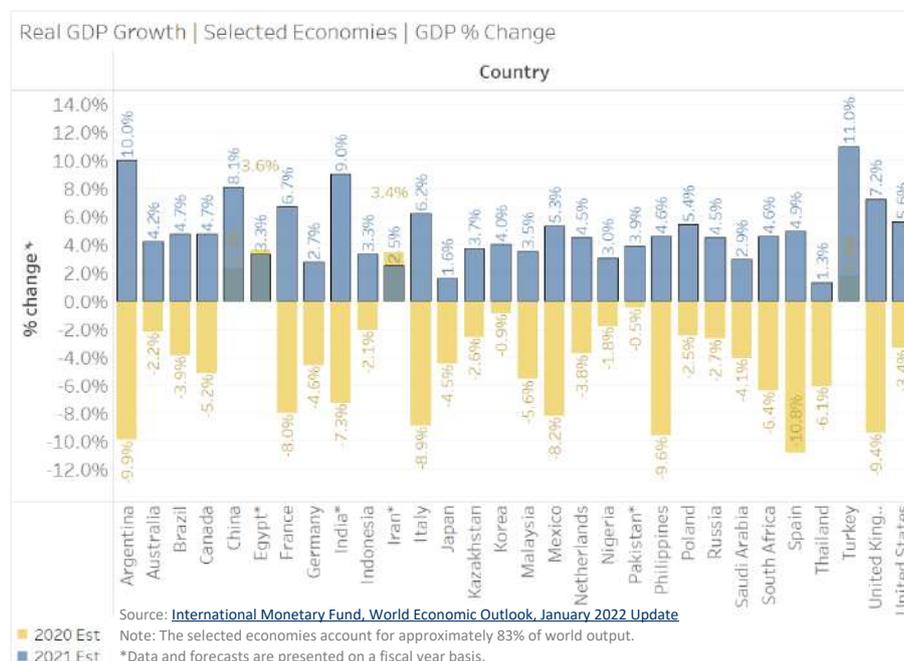
The chart opposite (*COVID-19 Data vs. S&P500*) provides an overview of the new COVID-19 vaccinations per day, new cases per day and deaths (cumulative) in comparison to the S&P500 (Standard & Poor's).

In early 2020, the S&P500 dropped by 1089, representing a 33% fall in just over a month. Following March 2020, the S&P500 was increasing continually up until the end of 2021.

In mid-2021, new COVID-19 vaccinations peaked over 45 million/day and new cases continued. The number of COVID-19 related deaths on a cumulative basis increased.

- S&P500 (Open)
- New Cases (per day)
- Total Deaths (Cumulative)
- New Vaccinations (per day)

1.1.2 GDP AND UNEMPLOYMENT

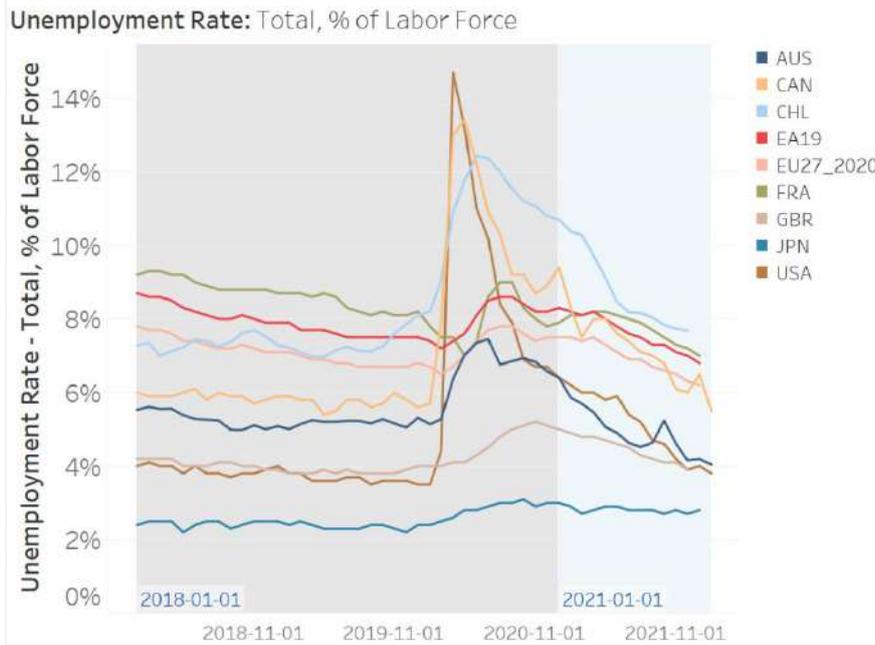


The chart opposite (*Real GDP Growth | Selected Economies | GDP % Change*) provides a summary of the real GDP growth estimates for 2020 and 2021.

During the onset of the CC in 2020, almost all economies had a negative GDP growth in real terms as a result of the pandemic induced market turmoil.

However, for 2021, each economy listed shows a positive percentage, with Turkey, Argentina, India, and China with the largest estimates across the economies.

¹ COVID-19 dataset, available at [Link](#)



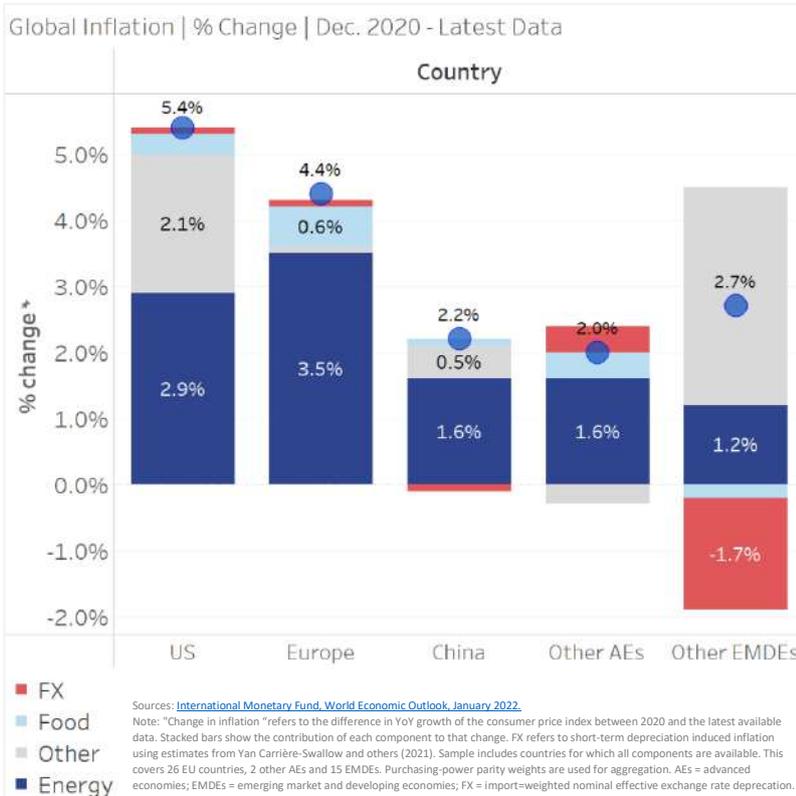
The chart opposite (*Unemployment Rate: Total, % of Labor Force*) provides an overview of the unemployment rates as a percentage of the total labor force for the selected economies.

As can be seen, prior to the CC, all unemployment levels seemed to be falling across each economy listed. However, following the CC in 2020, these figures spiked to record highs in comparison to the previous years.

In 2021 (blue shaded section, Right Hand Side ("RHS")), however, almost all unemployment rates began to fall steadily, reaching pre-CC levels, and in some cases lower levels than at the onset of the pandemic.

Source: <https://data.oecd.org/unemp/unemployment-rate.htm>

1.1.3 INFLATION AND INTEREST RATES



The chart opposite (*Global Inflation | % Change | Dec. 2020 - Latest Data*) provides the latest inflation statistics from December 2020 to latest data of the January 2022 International Monetary Fund's ("IMF") World Economic Outlook [IMF WEO](#) spanning Energy, Food, FX, and other. The percentage change in inflation refers to the difference in Year-over-year ("YoY") growth of the consumer price index between 2020 and the latest available data from the IMF.

2021 was a remarkable year for inflation, driven by the on-going effects of the COVID-19 pandemic and the advent of the new Omicron variant in late 2021. Inflation observed across all nations globally was particularly dramatic, but especially in Europe with fossil-fuel prices increasing to almost two-times the standard levels.

The Bureau of Labor Statistics estimated 7.9% inflation rate in 2021 (as of February 2022) for the U.S. alone, the highest recorded levels seen for 40 years, since 1982.

From the U.S. Bureau of Labor Statistics, Consumer Price Index News Release – February 2022², in the U.S. alone, for the 12-month period between February 2021 and February 2022, energy remained the largest contributor to inflation (23.8% in Feb 2022, Year-to-date ("YTD")). Further, for February 2022, Gasoline reached a 38% change YTD, with fuel oil reaching a 43.6% change YTD. Food increased by a 7.9% change YTD consistently from August 2021 to February 2022, albeit with a slight decrease for the months of November and December 2021. It is important to note that even excluding volatile energy and food categories, the Consumer Price Index rose 6.4% over the 12-month period February 2021 - 2022, a remarkable amount not seen in the last 40 years.

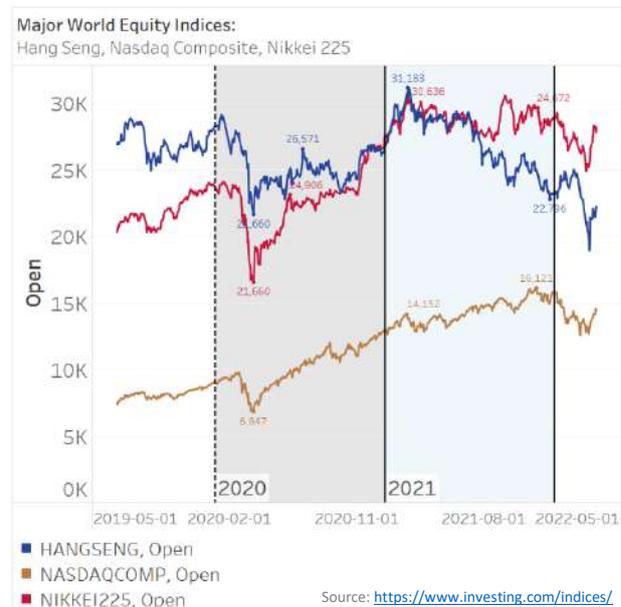
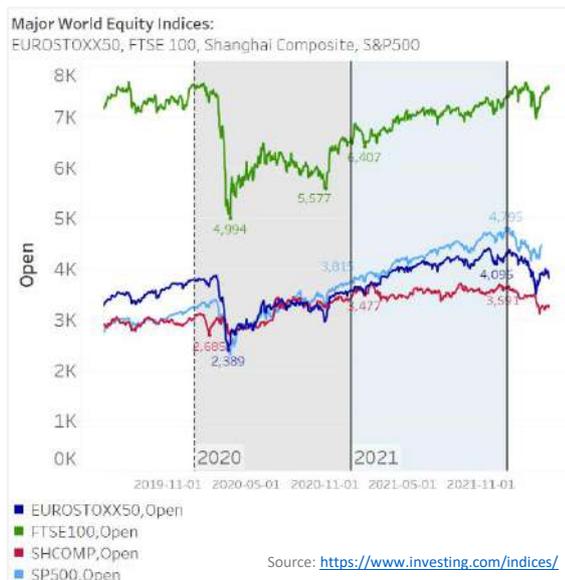
² U.S. Bureau of Labor Statistics, Consumer Price Index News Release (February 2022), available at [Link](#)

The continued effects of the COVID-19 pandemic and the Omicron variant in late 2021, coupled with the supply chain constraints and labor shortages across many nations, continued to exacerbate the heightened inflationary environment.³

In order to counteract the rising of prices, in 2021, some central banks decided to raise interest rates which had been at historically low levels for many years, in some cases even since the Global Financial Crisis (“GFC”). Central banks of Brazil, New Zealand, Poland, Russia, South Africa, South Korea, and the United Kingdom were among those that availed themselves to this tool to fight inflation. The Bank of England raised interest rates from 0.1% to 0.25% in December 2021. The US Federal Reserve System closed the year with plans to raise interest rates three times in 2022.⁴ The European Central Bank though seemed to be in no hurry to follow suit, intending to first end its programme of bond-buying before introducing changes to its rates.⁵

1.1.4 EQUITY, BOND, COMMODITY, AND CRYPTO MARKET⁶

The charts and analyses below provide an overview of how the equity, bond, commodity, and crypto markets fared in 2021 when comparing to previous years, and our last 2020 AMR publication in 2021.

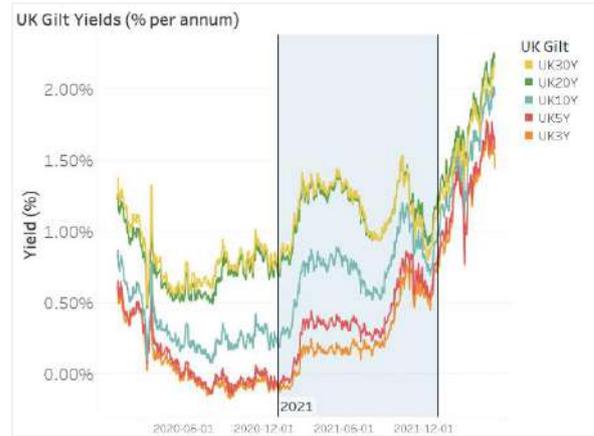
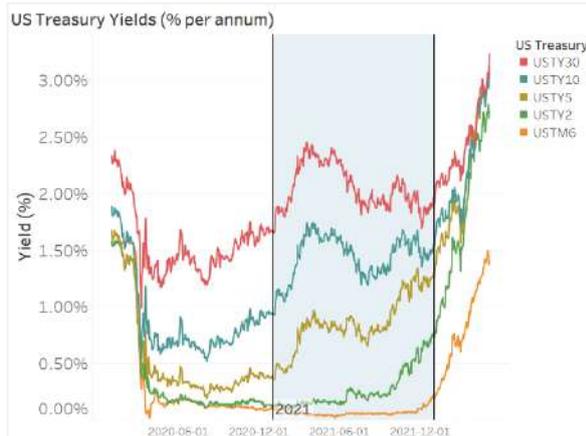


The chart above (Left Hand Side (“LHS”)) (*Major World Equity Indices: EUROSTOXX50, FTSE 100, Shanghai Composite, S&P 500*) provides an overview of these indices from 2019 through to 2021. As shown, during the CC period all equity indices were affected by the pandemic, however, since late 2020 and throughout 2021, there has been a steady upwards trend. The Financial Times Stock Exchange (“FTSE”) 100 in particular has made a considerable recovery.

The chart above (RHS) (*Major World Equity Indices: Hang Seng, Nasdaq Composite, Nikkei 225*) provides an overview of how these three indices fared during pre-pandemic periods and throughout 2020 and 2021. The Hang Seng and Nikkei 225 saw a considerable dip from early 2021 towards the end of 2021. The Nasdaq Composite saw a steady uptrend throughout 2021.

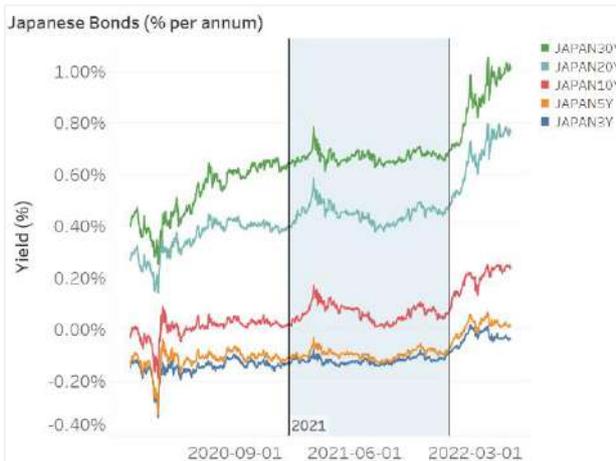
³ *Ibid.*
⁴ Reuters, BoE hikes, Fed pivots, ECB rolls slow as pandemic exits diverge (December 2021), available at [Link](#)
⁵ Reuters, ECB has 'extra space' before first rate hike, Lagarde says (March 2022), available at [Link](#)
⁶ Investing.com, Global indices source, available at [Link](#)

The charts below provide an overview of the bond market from the perspective of U.S. treasuries, UK Gilts and Japanese Bonds.⁷



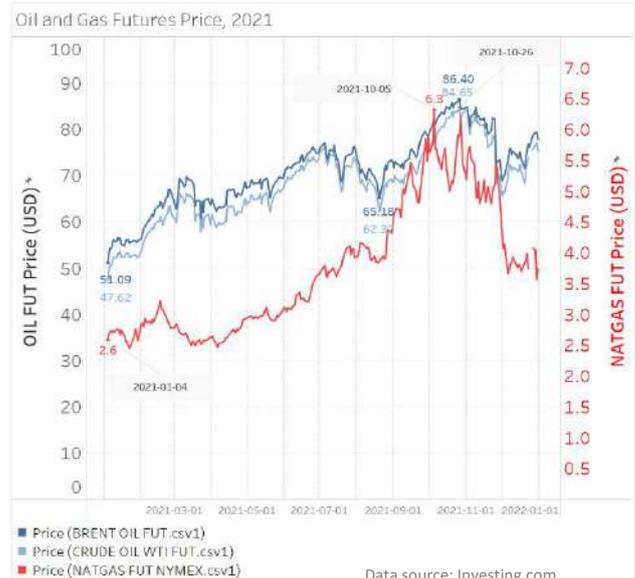
The chart above (LHS) (*US Treasury Yields (% per annum)*) provides an overview of the US Treasury yields during 2020 and 2021. In 2021, Treasury yields increased with an upwards trend in the first quarter of 2021, and then had a short dip before remaining elevated for the remaining part of the year. Treasury yields overall have remained above levels seen during the CC.

The chart above (RHS) (*UK Gilt Yields (% per annum)*) provides an overview of the UK Gilt yields throughout 2020 and 2021. There is a similar pattern to the US Treasuries, however, the UK Gilt yields peaked beyond their 2021 Q1 figures in the latter half of 2021, before falling again at the end of the year.



The chart opposite (*Japanese Bonds (% per annum)*) provides an overview of selected Japanese Bonds during 2020 and 2021. As seen, in 2021, all bond tenors peaked in late February 2021, followed by a plateau and horizontal trends for more or less the remaining part of the year.

Short term bonds (3-year and 5-year) tended to have a more pronounced horizontal trend for March 2021 onwards.



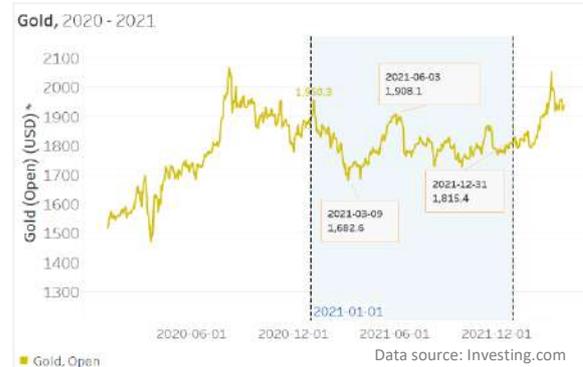
⁷ Investing.com, UST, UK Gilt, and Japanese Bond source: [Link](#)

The chart above (LHS) (*Oil and Gas Futures Price, 2019 - 2021*) provides an overview of the price of oil and gas from early 2019 until the end of 2021. In our last publication of the [CCP12 2020 AMR](#) released in early 2021, we examined the tumultuous effects of the pandemic on the global stage for all asset classes, especially for oil. In 2021, with some easing of lockdowns and the global economy in recovery, the oil markets (as seen from both charts above) recovered to pre-CC levels. Both Brent and WTI Futures experienced a 69.1% and 77.8% increase respectively between 2021 Q1 and 2021 Q4. Natural Gas Futures experienced a rise of 142% between 4th Jan 2021 and 5th October 2021.

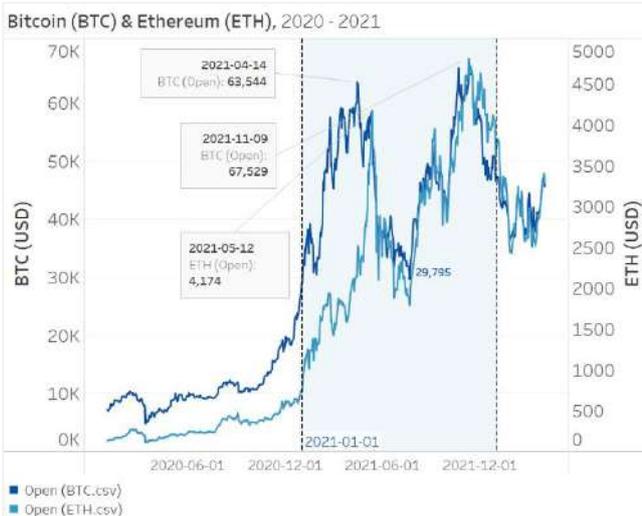
The chart on the right (*Gold, 2020 - 2021*) indicates that Gold prices remained resilient in 2021, irrespective of the continued aftereffects of the pandemic, supply chain constraints globally and the inflationary environment.

However, the price of Gold/Oz retreated from the all-time highs of 2020 during the onset of COVID-19.

In 2021, Gold started at USD 1960.3/Oz, followed by a dip in March to 1682.6/Oz. Following this, Gold rebounded to USD 1908.1/Oz, before settling around the USD 1815.4/Oz mark at the end of 2021.



2021 was a remarkable year for cryptocurrency, especially for the uptake in centrally cleared cryptocurrency contracts (for further information, see section: [Innovative Products and Services in Clearing for 2021](#)). Both Bitcoin (“BTC”) and Ethereum (“ETH”) reached all-time highs (chart below). Despite the mid-year dip in July 2021, BTC and ETH remained relatively resilient against the backdrop of an economic recovery, where all market participants were in the midst of the COVID-19 aftermath.



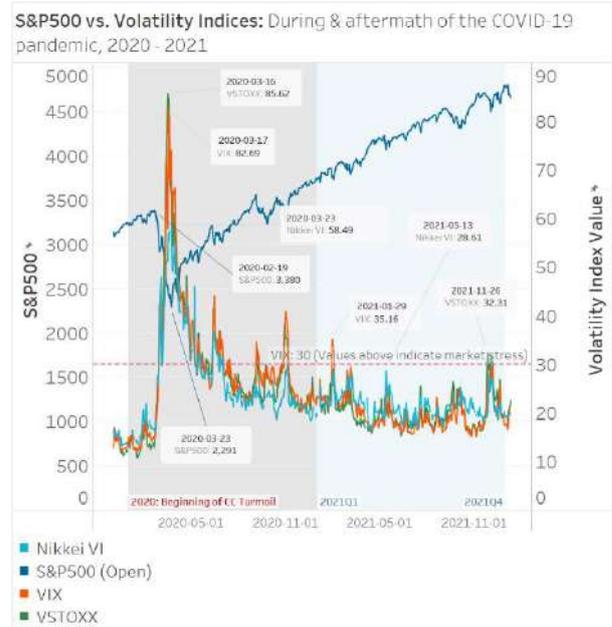
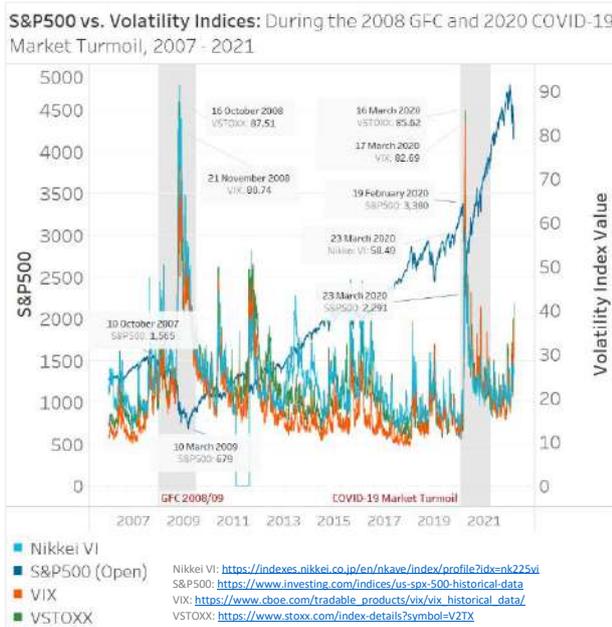
The Crypto-Rollercoaster:

The chart opposite (*Bitcoin (BTC) & Ethereum (ETH), 2020 – 2021*) provides an overview of the changes in prices of BTC/USD and ETH/USD.

As seen during the start of 2021, both BTC and ETH had a rapid upwards trend in January, followed by a small dip. Following this, both BTC and ETH cryptocurrencies reached highs of USD 63.5k and USD 4.2k in April and May, respectively. During May, both cryptocurrencies dropped dramatically. BTC fell 53.1% between 14th April 2021 and 21st July 2021 and ETH fell 57.2% between 12th May 2021 and 21st July 2021.

1.1.5 GLOBAL VOLATILITY INDICES

Within this section, we examine the extent to which volatility indices fluctuated and the specifics of how these influenced the markets. The charts below indicate a macro view of the last fifteen years (LHS) and a closer look at the last two years following the CC market recovery in 2021 (RHS).



The chart above (LHS) (*S&P500 vs. Volatility Indices: During the 2008 GFC and 2020 COVID-19 Market Turmoil, 2007 - 2021*) illustrates the macro view of the serious extent to which the COVID-19 pandemic affected the global markets from the perspective of analyzing the volatility indices.

The rapid onset of the COVID-19 pandemic coupled with global economies rushing to respond to such a health crisis quickly left the global markets highly volatile in early 2020, beginning in late February 2020. The VIX reached its record highest value of 82.69 on 17th March 2020, surpassing that during the GFC, while the VSTOXX reached highs of 85.62. The Nikkei VI responded in a similar fashion during the heightened volatile period of March 2020. However, the S&P500 remained resilient following the aftermath of both the GFC and CC, with a continued uptrend, as indicated by the data.

By comparing years 2020 and 2021 in the chart above (RHS) (*S&P500 vs. Volatility Indices: During & aftermath of the COVID-19 pandemic, 2020 - 2021*), we can observe that for most of 2020, volatility in markets remained at heightened levels until the end of that year. Leading into 2021, the VIX spiked on 29th January 2021 with a value of 35.16, however, normalising to lower levels throughout the year (readings at 30 and above indicate stress in the equity markets). Within 2021, there were overall four points where volatility either breached the 30 mark or was very close to it. Moving to the end of 2021, volatility spiked again in November where the VSTOXX reached 32.31 on 26th November 2021.

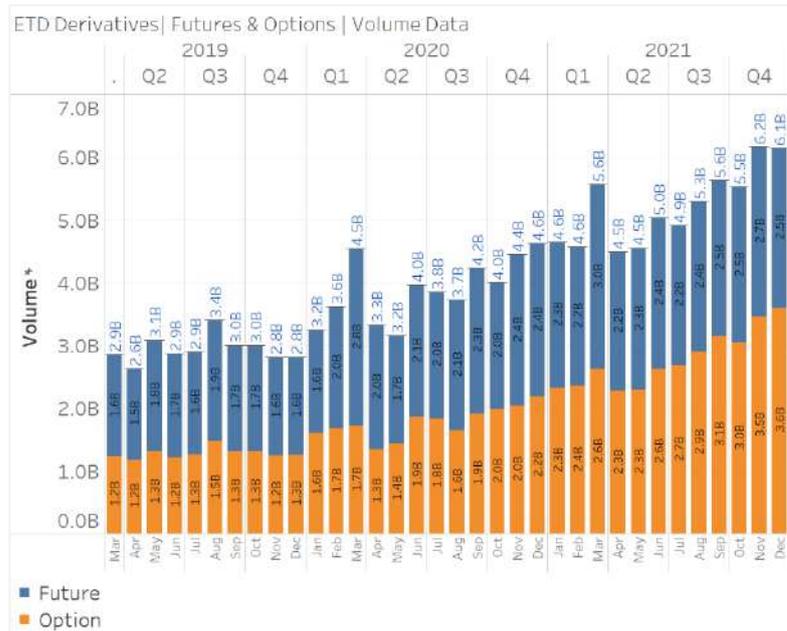
Throughout 2021, the S&P500 remained with a steady uptrend despite market volatility during the aforementioned period. It is likely that with COVID-19 vaccination rates increasing and the number of new tests increasing, market volatility will be lessened by the impact of COVID-19 related turmoil, however, with the current war in Ukraine, this could tell a different story for 2022.

1.1.6 EXCHANGE TRADED DERIVATIVES MARKET

The chart opposite (*ETD Derivatives | Futures & Options | Volume Data*) provides an overview of the total futures and options trading volume traded on exchanges worldwide from 2019 to 2021.

As can be seen from the chart, there was a clear uptrend in volumes Quarter-on-Quarter (“QoQ”) with notable peaks in 2020 Q1, 2021 Q1 and 2021 Q4.

The proportion of futures to options contracts has shifted since 2019 where futures were the majority. Since 2021 Q2, options contracts have exceeded futures volumes globally as seen from the data. Futures and options volumes reached a record 6.2 billion contracts in November 2021, the highest to date.

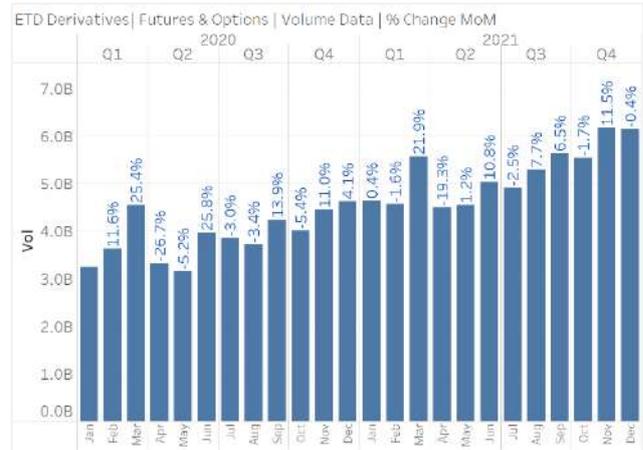
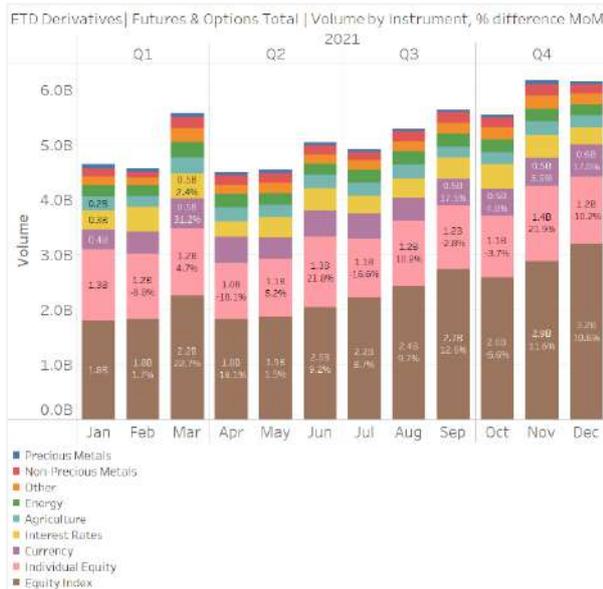


The total trading volume for 2021 surpassed that of all previous years, reaching 62.3 billion contracts in aggregate, up 33.7% from 2020. A clear uptrend in options contracts observed since early 2021 and a steady volume of futures contracts highlight the tendency for market participants to take on more derivatives contracts over the last two years since the onset of the COVID-19 pandemic.

The charts below show both the distribution of contracts on a category basis and the percentage change Month-on-Month (“MoM”). As seen from the below chart (LHS), equity index contracts and individual equity have continued to remain the largest share of the trading activity. The remaining instrument categories have remained fairly consistent from 2021 Q1 to 2021 Q4.

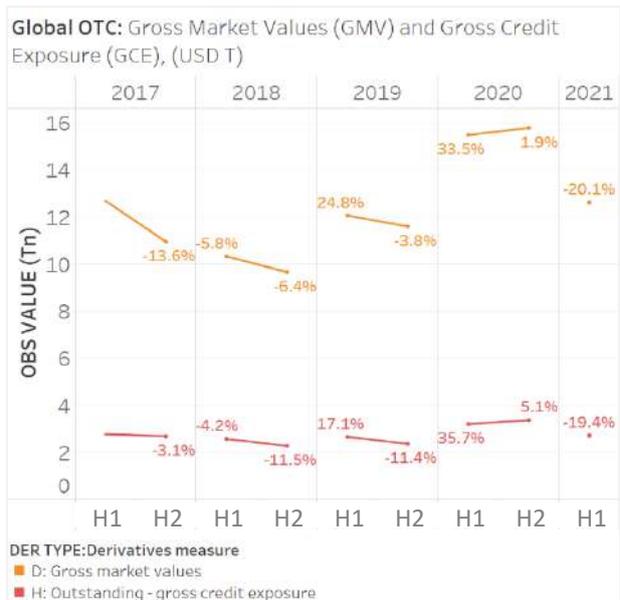
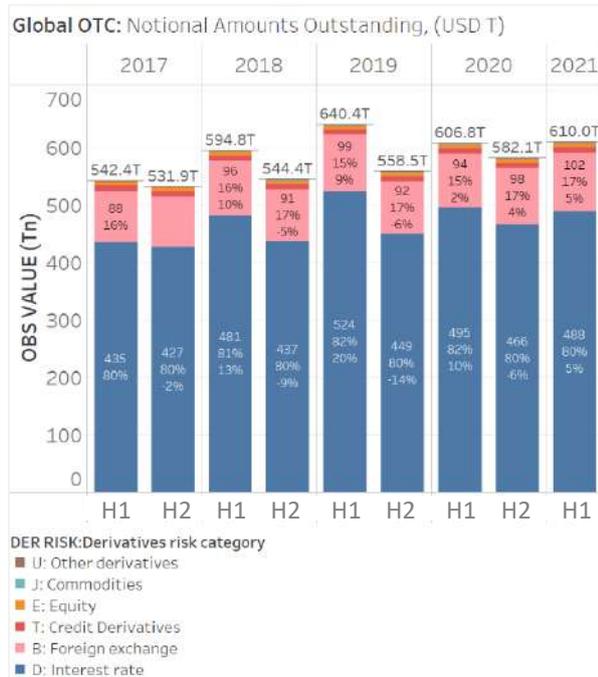
Equity index contracts saw the largest and steady growth with a 77.8% increase from January 2021 to December 2021. On the other hand, individual equity contracts remained relatively flat, between 1 to 1.3 billion in trading activity. In percentage terms (chart, bottom RHS) for overall futures and options trading activity, the majority of the changes were seen in 2021 Q1 and Q4 where volumes reached an almost 22% increase in March 2021 and an 11.5% increase in November 2021.⁸

⁸ FIA, Global futures and options trading hits another record in 2021 (January 2022), available at [Link](#). The statistics on volume and open interest are collected from 85 exchanges operated by 54 companies in 33 countries.



1.1.7 GLOBAL OTC DERIVATIVES MARKET

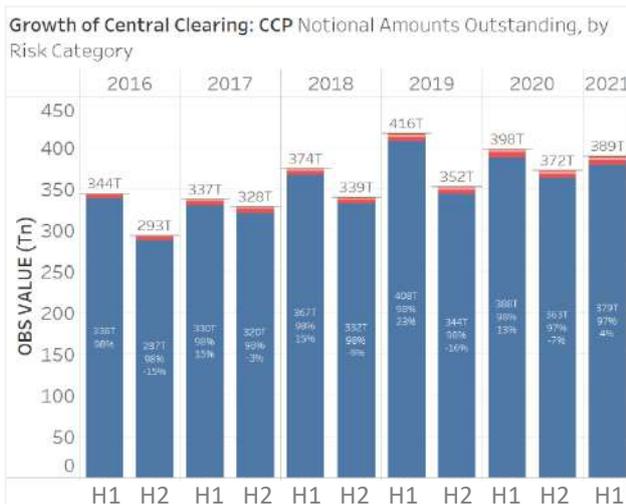
The following statistics provide details of the global OTC derivatives market in recent years. The data provided comes directly from the Bank for International Settlements (“BIS”) and it is important to note that the data statistics capture the outstanding positions of banks and other major derivatives dealers at June-end and December-end of each year (denoted by H1 and H2 for the charts)⁹.



⁹ BIS data directly from the BIS statistics warehouse, available at [Link](#), Explanatory notes: [Link](#)

The chart above (LHS) (*Global OTC: Notional Amounts Outstanding, (USD T)*) provides an overview of the notional amounts outstanding (“NAO”) of the global OTC derivatives market split by the derivatives risk category. The first percentage within each bar indicates the proportion of the total. As shown, interest rate derivatives remained the largest portion of the NAO. The second percentage indicates the percentage change from the previous half year 2020 H2 to 2021 H1. For the first half of 2021, the total NAO reached USD 610 trillion at June-end, an increase of 4.8%. Interest rate and foreign exchange derivatives both increased by 5%.

The chart above (RHS) (*Global OTC: Gross Market Values (GMV) and Gross Credit Exposure (GCE), (USD T)*) provides an overview of how the Gross Market Value (“GMV”) and the Gross Credit Exposure (“GCE”) changed over the years, including in 2021 H1. The GMV tracks the aggregate un-netted change in value of outstanding contracts, and thus sheds further light onto the scale of risk transfer in OTC markets. The GCE is a more precise measure of risk, as it accounts for enforceable netting agreements. In 2021 H1, the GMV decreased by 20.1% to USD 12.6 trillion and the GCE decreased by 19.4% to USD 2.7 trillion in 2021 H1.



The chart opposite (*Growth of Central Clearing: CCP Notional Amounts Outstanding, by Risk Category*) provides a summary of different derivatives cleared at global CCPs. As shown, for 2021 H1, the total NAO exceeded their 2020 H2 values to reach USD 389 trillion in total, an increase of over 4.5% - a total similar to 2020 H1 figures. Interest rate derivatives increased 4% over the period. The remaining risk categories made up 3% of the total NAO for the period. Overall, there was an upwards trend since 2016.



1.1.8 MARGIN FOR UNCLEARED DERIVATIVES

The International Swaps and Derivatives Association (“ISDA”) Margin Survey year-end 2021 examines the amount and type of initial margin (“IM”) and variation margin (“VM”) posted for non-cleared derivatives.¹⁰ The survey also reviews the quantity of IM posted by all market participants to major CCPs for their cleared interest rate derivative (“IRD”) and credit default swap (“CDS”) transactions.

From the latest ISDA report, the amount of regulatory IM continued to rise following the ongoing phasing-in of new firms and new transactions being captured by the non-cleared margin rules.

Non-Cleared Margin Rules

The non-cleared margin rules for derivatives (requiring the mandatory posting of IM and VM for OTC derivatives that are not cleared through CCPs) originate from a global policy framework and schedule established by the Basel Committee on Banking Supervision (“BCBS”) and the International Organization of Securities Commissions (“IOSCO”).

The IM and VM requirements for phase-one entities took effect on 1st September 2016 in the US, Canada, and Japan, and on 4th February 2017 in the EU. VM requirements for all covered entities became effective on 1st March 2017. Phase-two entities were captured by the IM rules on 1st September 2017. Phase-three, four and five firms implemented the IM requirements on 1st September 2018, 2019, and 2021, respectively. The IM requirements for phase-six entities will soon come into force – on 1st September 2022.

The ISDA Margin Survey finds that the 20 largest market participants (which are phase-one firms) collected USD 286 billion of IM for their non-cleared derivatives transactions at year-end 2021, where USD 203.5 billion was collected from counterparties currently in-scope of the regulatory IM requirements and USD 82.5 billion was

¹⁰ ISDA Margin Survey Year-End 2021, available at [Link](#)

Independent Amount (“IA”) from counterparties and/or for transactions not in scope of the non-cleared margin rules (which also include the legacy transactions).

With regards to VM collected by phase-one firms for non-cleared derivatives, this decreased by 19.6% to USD 936.5 billion, in comparison to USD 1.2 trillion collected at year-end 2020. Out of this VM, USD 527.9 billion collected by phase-one firms was required under the margin regulations which was a 17.3% decline compared to USD 638.5 billion of regulatory VM collected at 2020 year-end.

The charts below (*Regulatory IM and Independent Amount (IA), Received and Posted by Phase-one Firms (USD B)*) provides an overview of the IM and IA either received or posted over the last five years. As shown, there has been a steady uptrend in both amounts. Total IM received in 2021 increased 57.5%, compared to IA which increased 5.6% for year-end 2021.

Please see [Appendix I](#) for a guide to interpret the figures in each bar segment.



1.1.9 SELECTED MARKET STRESS EVENTS

In 2021, no CCP12 members experienced a CM default event, however market participants and end investors experienced some stress events which had significant consequences for many entities and opened new discussions among authorities.

1.1.9.1 JANUARY MEME VOLATILITY EVENTS¹¹

During the week of 25th January 2021, the market saw unusually high volumes and price volatility in certain securities that had been popularized on internet message boards, including GameStop Corp. The National Securities Clearing Corporation (“NSCC”) actively monitored market developments as volumes and prices rose in these “meme” securities at the beginning of the week.¹² NSCC experienced the two highest transaction volume days in its history on Wednesday, 27th January, and Thursday, 28th January. On Wednesday, NSCC processed approximately 474 million transaction sides, exceeding the March 2020 volume record by more than 100 million. Risk at NSCC, as measured by NSCC’s aggregate clearing fund requirement, also increased substantially on 28th January, to USD 33.5 billion, slightly higher than the peak that occurred in March 2020 and just under NSCC’s historical maximum.

Extreme market volatility and even “short squeeze” events are not new phenomena. What was unusual was that activity in the volatile meme securities was also more concentrated in the portfolios of firms that primarily support individual investors. The concentrated retail interest in purchasing meme securities and the related

¹¹ Source is the written testimony of Michael C. Bodson, Chief Executive Officer, The Depository Trust & Clearing Corporation in the Hearing Before the U.S. House of Representatives Committee on Financial Services, May 6, 2021.

¹² NSCC provides clearing, settlement, risk management, and CCP services for trades involving equities, corporate and municipal debt, exchange-traded funds, and unit investment trusts in the United States. NSCC is a subsidiary of The Depository Trust & Clearing Corporation which is a CCP12 member.

spike in the prices of those securities was a substantial factor in generating the near-peak aggregate clearing fund requirements at NSCC on 28th January, 2021. The impact of that increase was more concentrated in the CMs whose clients drove that activity. The impact of the March 2020 market volatility and the related increase in NSCC clearing fund requirements, by contrast, was more evenly distributed across CMs.

1.1.9.2 ARCHEGOS CAPITAL MANAGEMENT

Archegos Capital Management was a family office fund which belonged to Bill Hwang, a former manager of Tiger Asia Management. It mainly traded in security-based (total return) swaps and used high leverage – also in cooperation with its prime brokers. Amongst others, Archegos took significant positions in ViacomCBS and other technology stocks, which, in late March 2021, caused margin calls in size it was unable to meet. As a result, its prime brokers proceeded to wind down Archegos’s positions. This led to overall losses for banks, amounting to USD 10 billion. While for some of the affected banks this had a significant impact on their yearly financial results, the financial system as a whole handled it well. Compared to the GFC, banks were much better prepared in terms of their capital and liquidity capabilities to deal with such events.

Having the status of a family office, the fund was managing assets of its owner and his family and was thus exempt from submitting financial reports to the U.S. Securities and Exchange Commission (“SEC”).¹³ Archegos’s default opened a big discussion around the lack of transparency of such funds’ actions and revealed the need to review prime brokers’ relationship with family offices.¹⁴

¹³ Reuters, Explainer: Why Archegos Capital was in U.S. regulators’ blind spot (April 27, 2022), available at [Link](#)

¹⁴ The Trade News, The collapse of Archegos Capital Management (July 16, 2021), available at [Link](#); FitchRatings, Archegos Fallout Signals Heightened Counterparty, Regulatory Risk (April 1, 2021), available at [Link](#)

2. THE CCP MODEL

A CCP acts as an intermediary and legally interposes itself between buyers and sellers of the markets for which it clears, becoming the buyer to every seller and the seller to every buyer. It is a market risk neutral manager, not a risk-taker in the markets it clears and a creditworthy counterparty to its participants that guarantees the financial performance of the trades it clears, including in the event of a default of one of the parties by requiring its participants to collateralize and settle their trade exposure. After novation – the process which results in the interposition of the CCP between the buyer and the seller of the trade – a multilateral netting benefit (through the removal of bilateral exposures) emerges and complexity, counterparty credit risk, collateral requirements and liquidity needs of participants are reduced. Through trade offsets, gross exposure is reduced significantly, resulting in a more streamlined and manageable trade infrastructure and a “matched-book”.

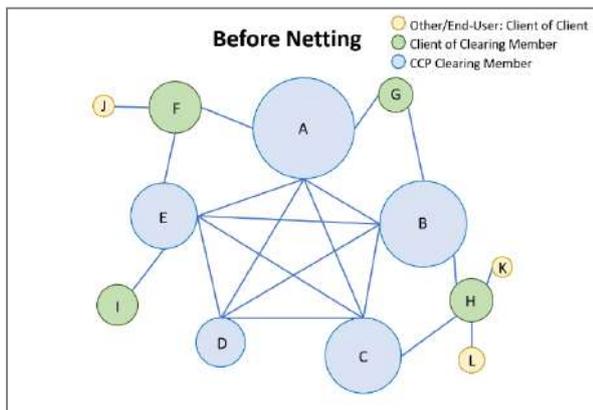


Figure 2-1: Bilateral World

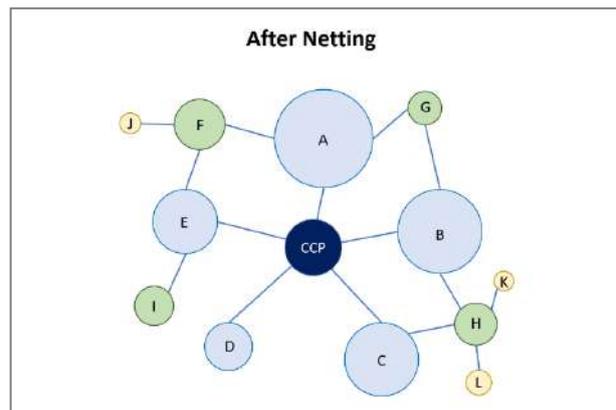


Figure 2-2: World with a CCP showing the multilateral netting benefits

Under the typical central clearing model, a CCP’s participants can either be CMs, which are approved by the CCP and are permitted to clear directly at the CCP, or they can be clients / non-clearing members, who do not directly face the CCP and must clear their trades via a clearing account through an appointed CM.

In order to reduce the impact of the default of one or more participants, CCPs have established a number of risk-mitigating techniques, in which CCPs address market, credit, and liquidity risks, among others. A CCP’s membership requirements, which are the first line of defence and can differ for each CCP, are rigorous, so only qualified and commercially proficient members are accepted. Compliance with the CCPs’ rulebooks is fundamental and constant monitoring through regular reporting and risk review is ensured. General requirements include, but are not limited to:

- Minimum equity capital requirements,
- Operational and administrative expertise,
- Suitable risk-management capabilities.¹⁵

In addition to these general requirements, if a CM provides client clearing, it is subject to membership requirements that are designed to ensure that it is able to guarantee the financial performance of its customers to the CCP.

As the second line of defence, CMs are required to post collateral at the CCP to cover open positions they hold with the CCP. This includes the collection of IM and Default Fund¹⁶ (“DF”) contributions and exchange of VM.

IM is posted to protect against future risk exposures for open positions and IM requirements are carefully calculated by CCP margin models. In particular, IM is calculated in order to cover potential liquidation costs during adverse market moves in the expected close-out period of the default management process (“DMP”).

¹⁵ CCP Lines of Defence - CCP12

¹⁶ May also be known as Reserve Fund, Guarantee Fund, Clearing Fund, or Security Deposits.

While multilateral netting can substantially reduce the risk exposures faced by a CCP, the residual risk that remains, in part, is addressed through the CCP’s collection of IM. IM requirements are established to meet a confidence level of at least 99% with respect to the estimated distribution of future exposures over the margin period of risk (“MPOR”).

VM – exchanged between a CCP and the CM on at least a daily basis – captures the mark-to-market on a CM’s open positions before settlement. That means that if a member’s contract has increased in value, the CCP is obliged to pay the member the difference. Conversely, if the contract declines in value, the member is obliged to pay the difference to the CCP.

The remaining lines of defence, which represent a typical CCP default waterfall, include:

- The defaulting CM’s resources, including the defaulter’s margin (IM and any other additional margin of the defaulting CM held by the respective CCP), the defaulting member’s DF contributions and any additional resources of the defaulting member available to the CCP;
- A layer of the CCP’s own equity (commonly known as the “CCP Skin-in-the-Game” or “SITG”) if the defaulting CM’s losses exceed the defaulting CMs resources;
- If a defaulting CM’s losses also exceed the SITG, the DF contributions of non-defaulting CMs are mutualized and used. CCP DFs are sized to cover tail risks arising from the default of the CCP’s largest CM, at a minimum, under extreme but plausible market conditions, however CCPs often size their DFs to cover the default of the two largest CMs; and
- Lastly, a CCP may also call for additional unfunded financial contributions from non-defaulting CMs (typically referred to as “assessments” or “cash calls”) or deploy other recovery tools.

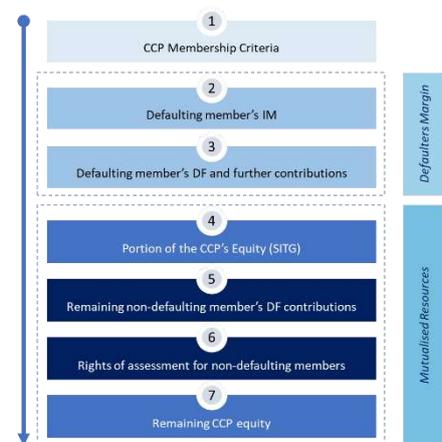


Figure 2-3: A typical CCP Default Waterfall

For more information on the central clearing model and CCPs’ best practices please check the CCP12’s Position Paper [CCP Best Practices](#) of May 2019.

3. CCP REGULATORY CONTEXT AND MARKET PRACTICES DEVELOPMENTS IN 2021

3.1 CCP STANDARDS AND REGULATIONS

After the GFC of 2008, CCPs' successful performance became the centre of attention for many authorities and standard setting bodies across the globe. This led to enhancement and codification of best practices in CCP risk management through the strengthening of the standards and regulations to which CCPs are subject. On a global level, the Committee on Payment and Settlement Systems (renamed as Committee on Payments and Market Infrastructures ("CPMI") in 2014) and IOSCO took the lead in this work and adopted the PFMI¹⁷ in 2012. Many jurisdictions enhanced their regulatory and supervisory frameworks for CCP, such as the U.S. Dodd-Frank Wall Street Reform and Consumer Protection Act¹⁸ of 2010 ("Dodd-Frank Act") and the European Market Infrastructure Regulation¹⁹ ("EMIR") of 2012 (adopted in the EU and retained by the UK after Brexit), to name just a few specific examples.

Principles for financial market infrastructures

In April 2012, with the aim to strengthen and preserve financial stability, CPMI and IOSCO released the PFMI – the international standards for financial market infrastructures ("FMIs"), i.e., payment systems, central securities depositories ("CSDs"), securities settlement systems, CCPs and trade repositories. The standards cover all important aspects of FMIs, such as general organisation, credit and liquidity risk management, settlement and custody, default management, general business and operational risk management, access, efficiency, and transparency.

A few months later, in December 2012, CPMI and IOSCO published another document "Principles for financial market infrastructures: Disclosure framework and Assessment methodology", which prescribe the form and content of the disclosures expected of FMIs. To enhance the transparency of CCPs even further, in February 2015 CPMI and IOSCO released "Public quantitative disclosure standards for central counterparties". Both of these publications provide the basis for CCPs' robust qualitative and quantitative disclosures.

Local jurisdictions and international standard setters have continued to bring forward various topics and proposals with respect to centrally cleared markets, including in 2021. The following non-exhaustive list provides some examples of consultations and reports to which CCP12 responded:²⁰

- The Financial Stability Board ("FSB") Discussion paper on "Regulatory and Supervisory Issues Relating to Outsourcing and Third-Party Relationships",²¹
- The Her Majesty's ("HM") Treasury Consultation on Expanded Resolution Regime: Central Counterparties,²²
- The European Securities and Markets Authority ("ESMA") Consultation Paper on the clearing and derivative trading obligations in view of the benchmark transition,²³
- ESMA's seven Consultation Papers on CCP Recovery Regime,²⁴

¹⁷ CPSS, IOSCO, Principles for Financial Market Infrastructures (April 2012), available at [Link](#)

¹⁸ Dodd-Frank Wall Street Reform and Consumer Protection Act, available at [Link](#)

¹⁹ Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories, available at [Link](#)

²⁰ CCP12, Submissions, available at [Link](#)

²¹ CCP12, Response to the FSB Discussion Paper on Regulatory and Supervisory Issues Relating to Outsourcing and Third-Party Relationships (January 2021), available at [Link](#)

²² CCP12, Response to the HM Treasury Consultation on Expanded Resolution Regime: Central Counterparties (May 2021), available at [Link](#)

²³ CCP12, Response to the ESMA Consultation Paper on the clearing and derivative trading obligations in view of the benchmark transition (September 2021), available at [Link](#)

²⁴ CCP12, Response to ESMA's seven Consultation Papers on CCP Recovery and Resolution Regime (CCPRRR) (September 2021), available at [Link](#)

- The Bank of England’s Consultation Paper on Derivatives clearing obligation – introduction of contracts referencing TONA: Amendment to BTS 2015/2205,²⁵
- The China Futures Law public consultation,²⁶
- The CPMI and IOSCO Consultative Report on Application of the Principles for Financial Market Infrastructures to stablecoin arrangements,²⁷
- The Bank of England’s Discussion Paper on Supervisory Stress Testing of Central Counterparties,²⁸
- The Commodity Futures Trading Commission’s (“CFTC”) Request for information and comment on the Swap Clearing Requirement to Account for the Transition From London Inter-Bank Offer Rate (“LIBOR”) and Other Inter-Bank Offered Rates (“IBORs”) to Alternative Reference Rates,²⁹
- ESMA’s six Consultation Papers on CCP Resolution Regime,³⁰
- BCBS, CPMI and IOSCO Consultative report on Review of margining practices,³¹
- CPMI and IOSCO Discussion paper on client clearing: access and portability,³²
- The Bank of England’s Consultation Papers on (1) the Bank of England’s approach to tiering incoming central counterparties under EMIR Article 25 and (2) the Bank of England’s approach to comparable compliance under EMIR Article 25a.³³

A lot of work undertaken by the international standard-setting bodies and local regulators in 2021 was focused on recovery and resolution regimes of CCPs, transition to Risk Free Rates and its influence on clearing obligations, CCP’s margining practices, and client clearing. All of these topics are elaborated on in the following sections.

3.2 INNOVATIVE PRODUCTS AND SERVICES IN CLEARING FOR 2021

CCPs clear a very wide variety of products. They actively introduce new products into their clearing offering to meet participants risk management needs and generally in response to the market demand. In 2021, many CCPs continued to broaden their product offering, further proving their resilience and ability to develop in challenging times.

In light of the continued interest in cryptos, some CCPs began to clear crypto related products. By way of example, CME offers clearing of Bitcoin futures and options and Ether futures. Eurex Clearing provides services related to physically settled Bitcoin ETN Futures. ICE US and ICE Singapore have also made Bitcoin futures available for clearing (physically and cash settled, respectively).

CCPs have also enhanced their offerings to include Environmental, Social, and Governance-related products (“ESG”) and functions that respond to the growing demand for solutions addressing climate risk. These offerings have taken different forms, such as a service enabling tracking and reporting of market participants’ hedging activities helping advance their sustainability goals as offered by CME, a range of ICE’s liquid futures that include climate and ESG strategies for market participants seeking to access and hedge ESG exposure, and

²⁵ CCP12, Response to the Bank of England’s Consultation Paper on Derivatives clearing obligation – introduction of contracts referencing TONA: Amendment to BTS 2015/2205 (October 2021), available at [Link](#)

²⁶ CCP12, Response to the China Futures Law public consultation (November 2021), available at [Link](#)

²⁷ CCP12, Response to the CPMI and IOSCO Consultative Report on Application of the Principles for Financial Market Infrastructures to stablecoin arrangements (December 2021), available at [Link](#)

²⁸ CCP12, Response to the Bank of England’s Discussion Paper on Supervisory Stress Testing of Central Counterparties (December 2021), available at [Link](#)

²⁹ CCP12, Response to the CFTC’s s Request for information and comment on the Swap Clearing Requirement To Account for the Transition From LIBOR and Other IBORs to Alternative Reference Rates (January 2022), available at [Link](#)

³⁰ CCP12, Response to ESMA’s 4 Consultation Papers on CCP Resolution Regime (CCPRRR) (January 2022), available at [Link](#)

³¹ CCP12, Response to the BCBS, CPMI, and IOSCO Consultative Report on Review of Margining Practices (January 2022), available at [Link](#)

³² CCP12, Response to the CPMI and IOSCO discussion paper on client clearing: access and portability (February 2022), available at [Link](#)

³³ CCP12, Response to the Bank of England’s Consultation Papers on the approach to tiering incoming central counterparties under EMIR Article 25 and to comparable compliance under EMIR Article 25a (February 2022), available at [Link](#)

clearing of ESG derivatives which gained much more traction at many CCPs in 2021, such as at CME, Eurex Clearing, and ICE.

3.3 DEFAULT MANAGEMENT AUCTIONS

The CPMI and IOSCO report “Central counterparty default management auctions – Issues for consideration” (June 2020)³⁴ encouraged the industry to collaborate and work on further development of default management auctions practices. CCP12, European Association of CCP Clearing Houses (“EACH”), Futures Industry Association (“FIA”), and ISDA formed an industry cooperation and published their joint paper on the category 1 issues³⁵ in May 2021. The areas covered within the category 1 paper were as follows:

- Standardization of auction terminology, including defining different types of auction formats;
- Standardization of certain operational aspects of auction procedures, including in particular:
 - methods of communication, including form of communication; and
 - formats for auction files, including auction portfolio and valuation files, by asset class.

As a next step, the above-mentioned associations together with client associations, such as FIA Principal Traders Group (“FIA PTG”) and Managed Funds Association (“MFA”) opened a discussion over category 2 issues, which includes governance of a CCP’s default management process, use of traders in default management groups, and the scope of client participation. The work will be finalised in 2022 while concurrently discussing category 3 issues. The third category is focused on the potential for further coordination and harmonisation among the default management processes of multiple CCPs, as it includes potential for synchronizing default management processes and identification of potential hedges between CCPs.

3.4 IOSCO, BCBS, AND CPMI MARGINING PRACTICES

Following the 2020 events shaped by the onset of the COVID-19 pandemic and the turmoil it caused in global financial markets, BCBS, CPMI, and IOSCO ran an analysis of how markets and their participants performed in this period of very high volatility and stress. This work resulted in the publication of a consultative report “Review of margining practices” in October 2021³⁶ which focused on three areas: (1) size, composition and drivers of margin calls, (2) transparency of margin practices, and (3) preparedness of market participants.

In its response to the report³⁷, CCP12 pointed out to the following facts and observations:

- The major elements of the reforms enacted following the GFC of 2008 behaved as expected and desired and despite the COVID-19 related crisis being a true stress event for financial markets, CCPs navigated it successfully.
- Greater use of CCPs mitigated counterparty credit risk, ensured exchange of mark-to-market and robust collateralisation through the stress event, and enabled market participants to continue to transact in risk transfer markets.
- Participants in centrally cleared markets, especially CMs, performed as expected, managed their margin obligations effectively during the cycle, including consistent overcollateralization and cash levels maintained at CCPs.
- The IM models of CCPs performed as expected, as the international and local standards for confidence levels were met and increases to margin requirements were lower than and relative to extraordinary

³⁴ CPMI, IOSCO, Central counterparty default management auctions – Issues for consideration (June 2020), available at [Link](#)

³⁵ CCP12, EACH, FIA, ISDA, CCP Default Auctions Best Practices Category 1 Issues: Terminology and Operational Aspects (February 2021), available at [Link](#)

³⁶ BCBS, CPMI, IOSCO, Consultative report “Review of margining practices” (October 2021), available at [Link](#)

³⁷ CCP12, Response to the BCBS, CPMI, and IOSCO Consultative Report on Review of Margining Practices (January 2022), available at [Link](#)

volatility observed, which, in part, was demonstrated by the substantial increases in the amount of VM exchanged.

- Significant transparency is provided by CCPs, including on margining, of which CCP12 is a strong proponent, given its benefits for risk management. Similar levels of transparency for the non-centrally cleared markets is also needed; at this stage, the data is insufficient to draw conclusions on non-centrally cleared markets, particularly with respect to IM, which is why CCP12 requested that the data and information relating to non-centrally cleared markets be improved and prepared a concept paper for Market Participant Public Quantitative Disclosures (“MPPQD”), which would complement regulatory statistics (e.g., BIS statistics) and those available from CCPs (e.g., CCP Public Quantitative Disclosures (“PQDs”)).

3.5 RECOVERY AND RESOLUTION REGIMES

As mentioned earlier, SSBs have focused on recovery and resolution regimes for CCPs. In 2021, the FSB, which is leading the resolution workstream, published an annual resolution report “Glass half-full or still half-empty?”³⁸. The report summarises the state of resolution and resolvability affairs regarding banks, CCPs, and insurers. It notices progress in CCP resolvability assessments made by home authorities.

The EU specifically focused work on CCP recovery and resolution in recent years. The provisions of the EU CCP Recovery and Resolution Regulation³⁹ (“EU CCP RRR”) entered into force on 11 February 2021 and will fully apply from 12 August 2022. The EU CCP RRR will supersede the national frameworks on CCP resolution. Those EU CCPs that are licensed as banks will no longer be subject to the EU Bank Recovery and Resolution Directive.

In 2021, ESMA was drafting the necessary technical standards and guidelines. This resulted in the publication of the seven consultation papers on draft Regulatory Technical Standards (“RTS”) or guidelines⁴⁰ in the context of the recovery regime referring to the methodology for calculation and maintenance of the additional amount of pre-funded dedicated own resources, order of compensation, the circumstances for temporary restrictions in the case of a significant non-default event, the consistent application of the triggers for the use of Early Intervention Measures, CCP recovery plan indicators, CCP recovery plan scenarios, and the factors that shall be considered by the competent authority and the supervisory college when assessing the CCP recovery plan. This package was followed by 6 consultation papers on draft RTS or guidelines related to different aspects of the resolution regime, such as resolution plans, methodology to value each contract prior to termination, valuation of CCPs assets and liabilities in resolution, application of the circumstances under which a CCP is deemed to be failing or likely to fail, resolution colleges and safeguards for clients and indirect clients. CCP12 submitted responses to all 7 consultation papers on recovery⁴¹ and to 4 out of 6 consultation papers on resolution.⁴²

3.6 CFTC MRAC’S ATTENTION ON CCP RISK AND GOVERNANCE

In 2021, the Market Risk Advisory Committee (“MRAC”), which advises the U.S. CFTC on matters regarding market structures, risks across CCPs, exchanges, intermediaries, market makers and end-users, continued its work on topics related to CCPs, with a special emphasis on CCP Risk and Governance. The MRAC approved 4 papers, prepared by the CCP Risk and Governance Subcommittee, which cover the following areas:

- Recommendations on CCP Governance (Feb 2021), which covered best practices for risk management committees and the role of risk forums to obtain risk-based views of market participants.⁴³

³⁸ FSB 2021 Resolution Report “Glass half-full or still half-empty?” (December 2021), available at [Link](#)

³⁹ Regulation (EU) 2021/23 of the European Parliament and of the Council of 16 December 2020 on a framework for the recovery and resolution of central counterparties and amending Regulations (EU) No 1095/2010, (EU) No 648/2012, (EU) No 600/2014, (EU) No 806/2014 and (EU) 2015/2365 and Directives 2002/47/EC, 2004/25/EC, 2007/36/EC, 2014/59/EU and (EU) 2017/1132, available at [Link](#)

⁴⁰ ESMA Consultations, available at [Link](#)

⁴¹ CCP12, Response to ESMA’s seven Consultation Papers on CCP Recovery and Resolution Regime (CCPRRR) (September 2021), available at [Link](#)

⁴² CCP12, Response to ESMA’s 4 Consultation Papers on CCP Resolution Regime (CCPRRR) (January 2022), available at [Link](#)

⁴³ U.S. CFTC MRAC Report, Recommendations on CCP Governance and summary of Subcommittee constituent perspectives, available at [Link](#)

- Recommendations regarding CCP margin methodologies (Feb 2021), which covered six key elements of a robust margin framework: Anti-procyclicality (“APC”), Concentration and Liquidity Add-ons, Intraday and Ad-Hoc Margin Calls, Margin Period of Risk, Pricing and Transparency.⁴⁴
- Recommendations regarding Derivatives Clearing Organizations (“DCO”) Capital and Skin-in-the-Game (Jul 2021), which covered the following areas: DCO SITG; DCO non-default losses; DCO capital available to address losses exceeding the default fund (including assessments); and ex-ante resources for addressing a DCO’s resolution. Views on DCO Stress Testing and Liquidity (Jul 2021) highlighted the following areas for discussion: Credit Stress Testing, Stress Scenarios, Reverse Stress Testing, Stress Period of Risk, Default Fund Re-sizing, Liquidity Stress Testing, Access to Central Bank accounts and Transparency.^{45 46}

3.7 CPMI AND IOSCO CLIENT CLEARING AND PORTING

In 2021, after a few-year-long analysis of the topic of client clearing and the new emerging models in this context, CPMI and IOSCO issued a consultation paper summarising its findings and looking for feedback from CCPs and market participants on if and what needs to be done to further develop the functionality of participating in clearing, other than in the full CM’s capacity.

While there are many different markets, with various types of participants, products, legal environments, and thus different needs resulting from these specificities, a consistent focus is on the ability for CCPs to conduct porting. While some markets already have helpful solutions in place to facilitate porting (such as the CFTC regulatory regime for centrally cleared derivatives which enables mass porting without clients’ explicit consent or the preference for the model of fully segregated client accounts as opposed to net omnibus accounts), others require legislative changes in their respective jurisdictions to remove some potential existing hindrances to porting.

Porting of clients’ positions and assets

Porting consists of transferring client positions and collateral from a defaulting CM to another. It enables clients of the defaulting CM to maintain their exposures, ultimately providing them continuity of clearing services. If porting is not possible, the CCP needs to liquidate clients’ positions and collateral at times which may be stressed market conditions. Therefore, porting is by far the preferred way of managing default for all market stakeholders and should be facilitated to the highest possible degree.

3.8 TRANSITION TO RISK-FREE RATES AND THE IMPACT ON CLEARING OBLIGATIONS

Another reform which resulted from the GFC has been the replacement of the IBORs with new benchmark rates, also known as alternative RFRs. Following the timeline of the reform, CCPs had to transition all Japanese Yen (“JPY”), British Sterling (“GBP”), Swiss Franc (“CHF”) and Euro (“EUR”) LIBOR-linked cleared trades to Tokyo Overnight Average (“TONA”), Sterling Overnight Index Average (“SONIA”), Swiss Average Overnight (“SARON”), and Euro Short Term Rate (“€STR”), respectively, before the end of 2021. This applied to all exchange traded and OTC derivatives linked to these rates. The transition events that took place between October and December 2021 were successful overall, as confirmed by many authorities, and proved CCPs’ operational robustness in what were some of the largest single day amendments to financial contracts for markets.

There is a fraction of legacy contracts currently connected with the temporary synthetic IBOR rates and these exposures need to be addressed in 2022. The main focus though will now be placed on the transition related to the USD LIBOR, which will cease to be available at the end of June 2023. This conversion has been and will

⁴⁴ U.S. CFTC MRAC Report, Recommendations regarding CCP margin methodologies, available at [Link](#)

⁴⁵ U.S. CFTC MRAC Report, DCO Capital and Skin-in-the-Game – areas for discussion, available at [Link](#)

⁴⁶ U.S. CFTC MRAC Report, DCO Stress Testing and Liquidity – areas for discussion, available at [Link](#)

be supported by the Secured Overnight Financing Rate (“SOFR”) First initiative recommended by the CFTC’s MRAC Interest Rate Benchmark Reform Subcommittee.⁴⁷

The transition to RFRs was also considered relative to clearing obligations in place in major jurisdictions. Regulators conducted many consultations in 2021 in order to obtain views and insight into the state of preparedness of market infrastructures and users to the change. By way of example, ESMA published its final report on draft RTS on the clearing and derivative trading obligations in view of the benchmark transition to risk free rates⁴⁸ in which it proposed to remove Basis swaps and Fixed-to-float interest rate swaps referencing LIBOR settled in GBP, JPY, and USD, Forward rate agreements referencing LIBOR settled in GBP and USD, and Overnight index swaps (“OIS”) referencing EONIA (EUR) and SONIA (GBP). Instead, a new clearing obligation was proposed to cover OISs referencing €STR (EUR), SONIA (GBP), and SOFR (USD). A similar request for comments was issued by the CFTC⁴⁹. Generally, it is of utmost importance that regulators ensure consistent introduction of changes to the clearing mandates in terms of the scope of instruments and the timelines of their implementation.

Risk Free Rates vs. IBORs

There are some significant differences between these two types of benchmarks:

- LIBOR was a forward-looking term rate, whereas RFRs are backward-looking overnight rates;
- LIBOR was based on borrowing quotes from banks, whereas RFRs are based on actual transactions;
- LIBOR was an unsecured borrowing rate, including the implied credit risk and a liquidity premium, whereas RFRs, being overnight rates, do not include these elements and can be both secured and unsecured.

⁴⁷ CFTC, Release Number 8409-21 (July 2021), available at [Link](#)

⁴⁸ ESMA Final Report On draft RTS on the clearing and derivative trading obligations in view of the benchmark transition to risk free rates, available at [Link](#)

⁴⁹ CFTC Request for information and comment, Swap Clearing Requirement To Account for the Transition From LIBOR and Other IBORs to Alternative Reference Rates (November 2021), available at [Link](#)

4. CCP DATA AND RESILIENCE IN 2021

4.1 CCP TRANSPARENCY

Transparency is foundational to efficient, fair, and sound financial markets. With that in mind, over the years, CCPs have adopted best practices to further promote confidence and provide the market with a level of comfort that CCPs have robust risk management frameworks and maintain adequate resources. CCPs have had a long-standing practice of providing publicly available rulebooks, that determine and organize market participants' rights and obligations.

CCPs also prepare qualitative disclosure frameworks in accordance with the internationally recognized PFMI published in April 2012 by CPSS and IOSCO. To complement the disclosure frameworks, CCPs also publish quantitative data quarterly in accordance with the Public Quantitative Disclosure standards published in February 2015.

The quantitative disclosures are refreshed on a quarterly basis. A more comprehensive summary of the history of CCPs' disclosures can be found in the CCP12 Paper "[Perspective on Transparency](#)" published in November 2021. The following sections present a selection of the most important CCP data for 2021.

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 CCP disclosures. Our members collaboratively worked to create a common PQD template in 2015, and officially released the CCP12 PQD Template in 2017. Several updates of the documents have been provided over the years, notably the new CCP12 PQD template was published in Feb 2021, and the PQD Frequently Asked Questions ("FAQ") Guide which provides details of the CCP12 PQD Template such as 'Disclosure Title', 'Reference', 'Description' and 'Reporting Frequency', as well as an FAQ section for each disclosure. The further updated PQD FAQ Guide in May 2022 will continue to help guide all market participants to interpret CCPs PQDs.

In light of CCP12's ongoing market engagement with CCP12 members, global market participants and regulators, a change in the PQD publication timeline from three to two months after the quarter-end has been made in May 2022 which has been recognised as a positive step to aiding market participants' ability to obtain PQD data more swiftly, without compromising the CCPs requirements for data accuracy, internal approvals, and in some cases, regulatory approvals. This is part of CCP12's ongoing efforts to enhance and accommodate market views to address better risk management practices across the industry.

4.2 INITIAL MARGIN, VARIATION MARGIN, AND DEFAULT FUND ANALYSIS

The data that CCPs provide through their PQDs provide the market with a great deal of transparency into cleared markets. The high level of standardization across the disclosures makes it straightforward for market participants to analyse cleared markets.^{50,51,52}

In this section, we explore the trends across IM, VM, and DF data with a special focus on the developments throughout 2021. For this we have looked at a broad group of CCP12 members' PQD data sets and analysed the developments from Q1 2016 until Q4 2021 across a selected 24 CCPs detailed in the below chart.⁵³

⁵⁰ BIS, Public quantitative disclosure standards for central counterparties (February 2015), available at [Link](#)

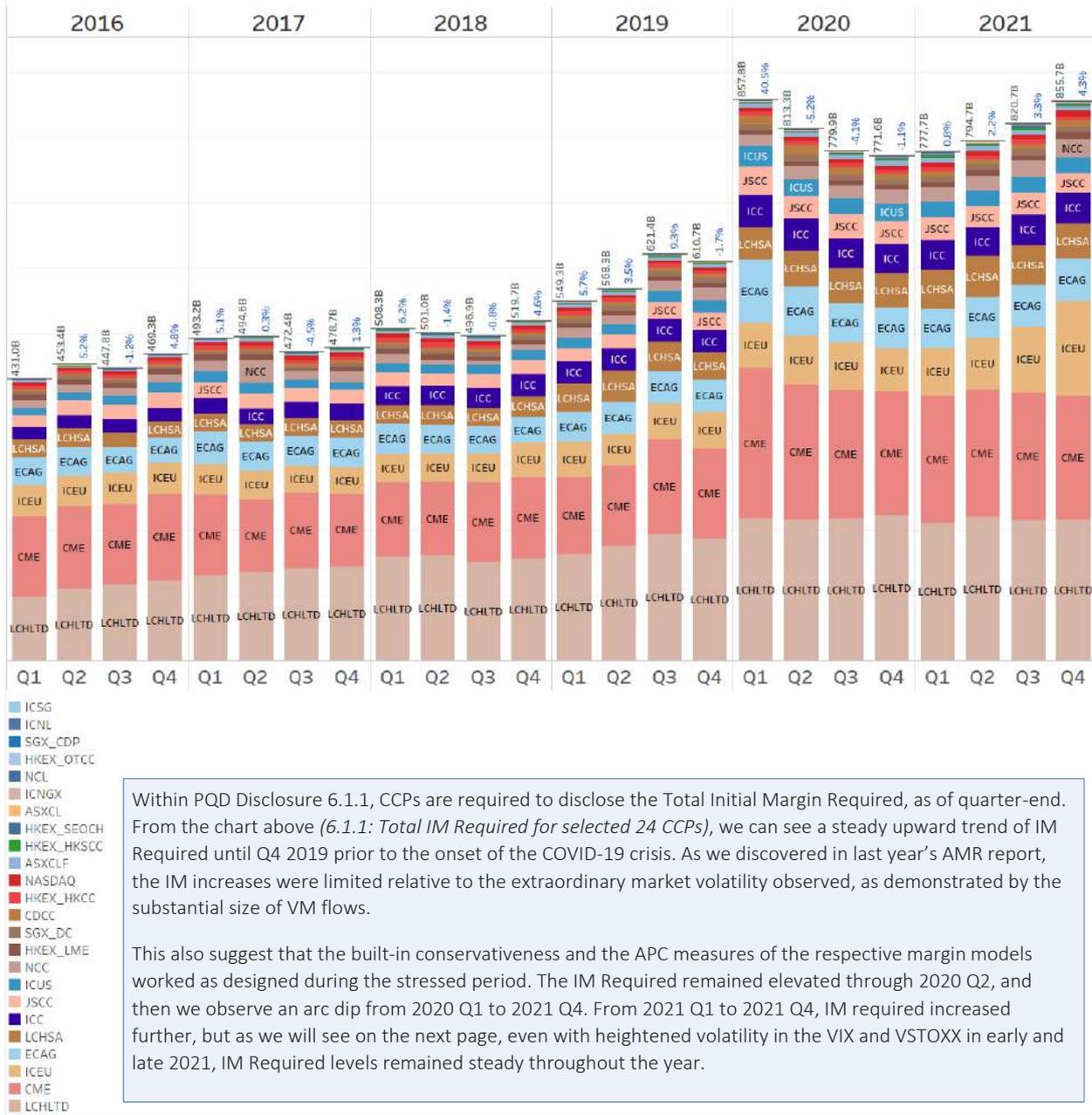
⁵¹ CCP12 PQD Template (accessed: 2022-05-16), available at [Link](#)

⁵² CCP12 PQD FAQ (accessed: 2022-05-16), available at [Link](#)

⁵³ Selected 24 CCPs used since these CCPs have been publishing since 2016 Q1 (or prior).

4.2.1 TOTAL IM (REQUIRED) ANALYSIS

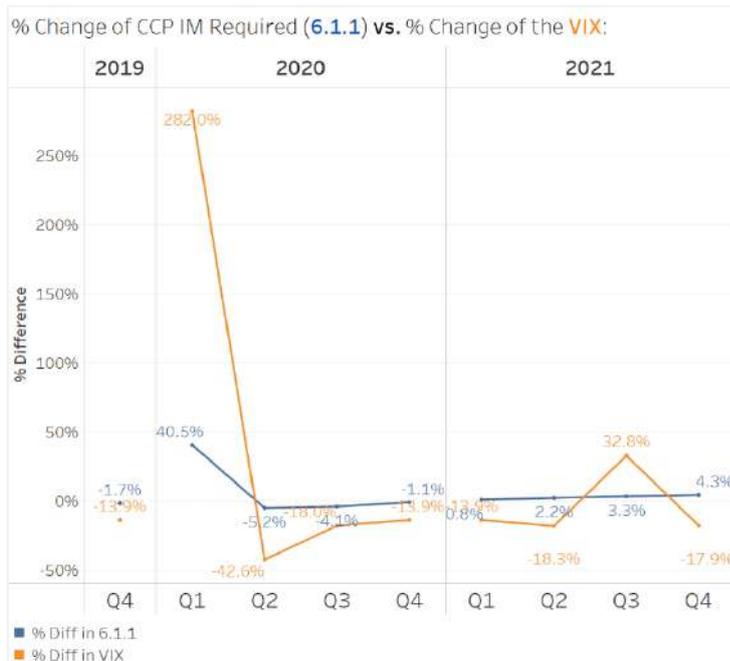
6.1.1: Total IM Required for selected 24 CCPs



Within PQD Disclosure 6.1.1, CCPs are required to disclose the Total Initial Margin Required, as of quarter-end. From the chart above (6.1.1: Total IM Required for selected 24 CCPs), we can see a steady upward trend of IM Required until Q4 2019 prior to the onset of the COVID-19 crisis. As we discovered in last year's AMR report, the IM increases were limited relative to the extraordinary market volatility observed, as demonstrated by the substantial size of VM flows.

This also suggest that the built-in conservativeness and the APC measures of the respective margin models worked as designed during the stressed period. The IM Required remained elevated through 2020 Q2, and then we observe an arc dip from 2020 Q1 to 2021 Q4. From 2021 Q1 to 2021 Q4, IM required increased further, but as we will see on the next page, even with heightened volatility in the VIX and VSTOXX in early and late 2021, IM Required levels remained steady throughout the year.

4.2.2 CHANGE IN IM (REQUIRED) VS. CHANGE IN VIX

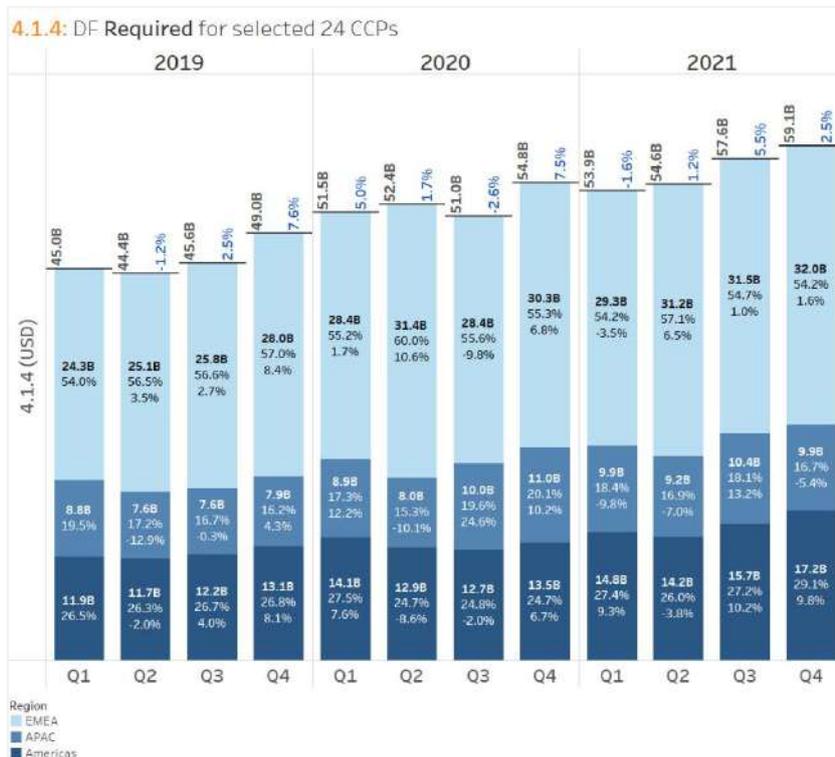


The chart opposite (*% Change of CCP IM required (6.1.1) vs. % Change of the VIX*) indicates the percentage changes each quarter from 31 Dec 2019 to 31 Dec 2021. As shown, between 31 Dec 2019 and 31 Mar 2020, there was a 282.0% increase in the Cboe Volatility Index® (“VIX”), compared to a 40.5% increase in IM Required for the selected 24 CCPs.

The story for 2021 shows us that even though between the PQD quarters, the VIX appears to have declined QoQ, the chart opposite shows us that the VIX was relatively heightened as mentioned. In particular, the VIX increased 32.8% between Q2 and Q3 2021.

CCP IM required on a quarterly basis has been very steady during heightened volatility, signalling well calibrated IM models.

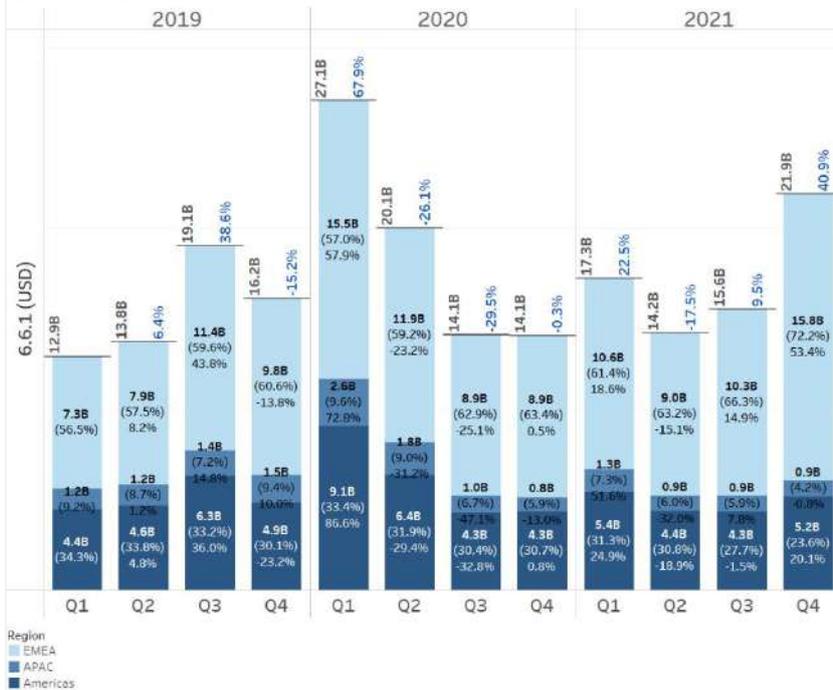
4.2.3 TOTAL DF (REQUIRED) ANALYSIS



The chart opposite (*4.1.4: DF Required for selected 24 CCPs*) indicates how the levels of default fund required changed between 2019 to 2021. We could observe a rather steady increase of the amount of the default fund contributions required by the selected 24 CCPs in all regions since the beginning of 2019. Please see [Appendix I](#) for a guide to interpret the figures in each bar segment.

4.2.4 TOTAL VARIATION MARGIN ANALYSIS

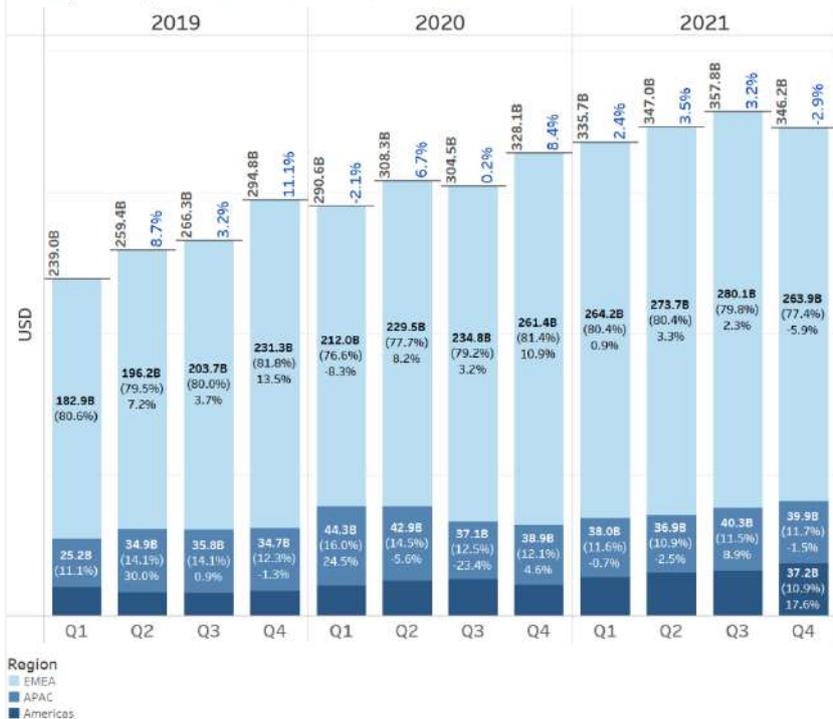
6.6.1: Sum of Total VM Paid to the CCP by participants each business day, for selected 24 CCPs.



The chart opposite (6.6.1: Sum of Total VM Paid to the CCP by participants each business day, for selected 24 CCPs) indicates how the change in total VM flow changed between 2019 to 2021. As analysed in the previous AMR covering 2020, VM flows during the CC increased significantly following the March 2020 volatility. Both CCPs and CMs managed to facilitate these payments without any material issues. VM levels were changing quite considerably throughout 2021, with an upward trend towards the end of the year, especially in the EMEA region where volatility increased again in 2021 Q4. Please see [Appendix I](#) for a guide to interpret the figures in each bar segment.

4.2.5 TOTAL IM AND DF OVERCOLLATERALISATION

Total (IM & DF) Overcollateralization, for selected 24 CCPs

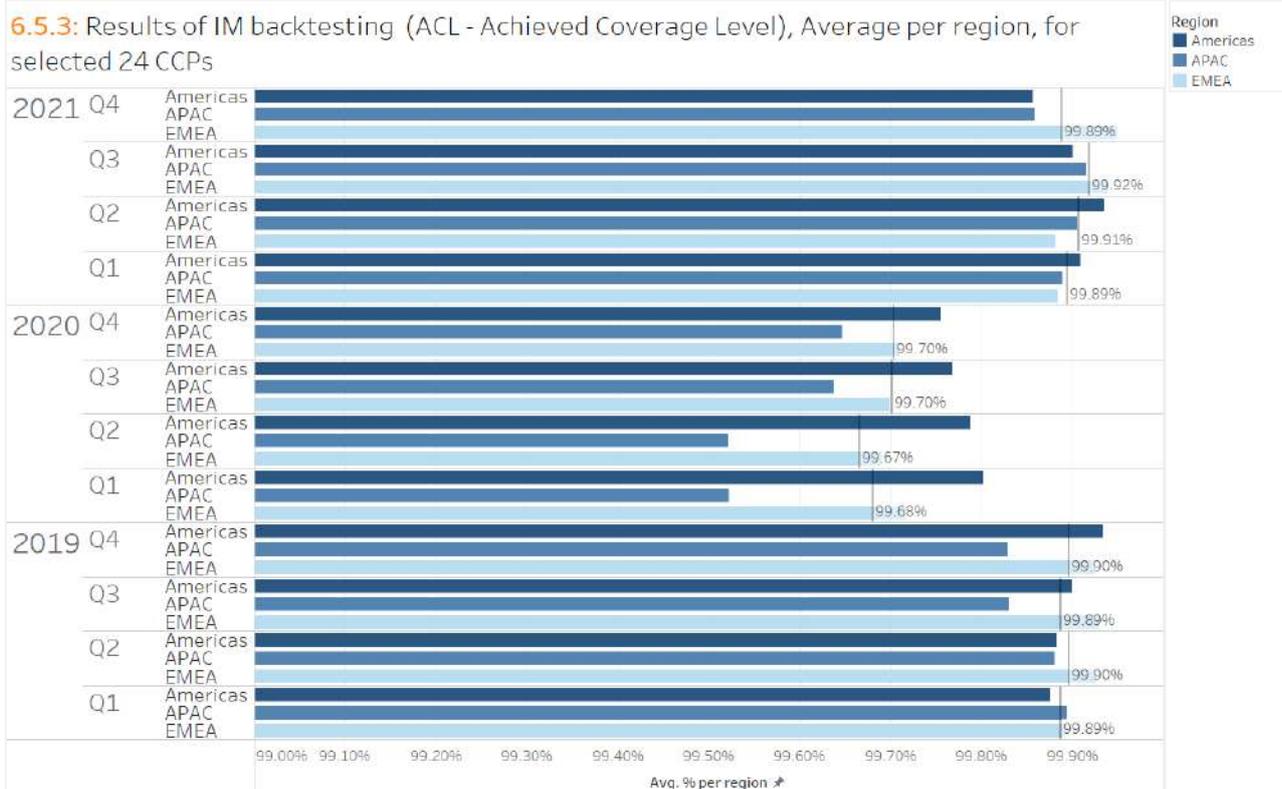


The chart opposite (*Total IM & DF Overcollateralization, for selected 24 CCPs*) indicates the change between 2019 to 2021. The total IM and DF overcollateralization shows a steady increase since 2019. The steadiness of the overcollateralization ratio throughout 2021 is evidence of the strong capital and liquidity profile of CMs. It also indicates that CCPs are perceived as a safe place for keeping cash and other assets by market participants.

Please see [Appendix I](#) for a guide to interpret the figures in each bar segment.

For further statistics and a geographical representation of the size of IM, DF, and VM flow per CCP and region, please see the CCP12 PQD Quarterly Trends Report released in June 2022. Further details can be found at: <https://ccp12.org/pqd/>

4.2.6 RESULTS OF BACKTESTING OF IM – ACHIEVED COVERAGE LEVEL (ACL)



The chart above 6.5.3: *Results of IM Backtesting (ACL – Achieved Coverage Level, Average per region)* provides an overview of the results of IM Backtesting (ACL). Backtesting is an important technique that a CCP utilizes to ensure that its initial margin model is performing as expected and that the assumptions within the model are valid.

According to the [Principles for Financial Market Infrastructures](#), a 99.00% coverage of backtesting is used as a benchmark to assess the efficiency of the initial margin model. However, a CCP may use a higher (percentile) benchmark, and as shown above, all cases are above 99.89% on average across all regions combined since 2021 Q1, indicating a much higher ACL than the standard requirement.

4.2.7 CCP CORE SYSTEM AVAILABILITY & OTHER STATISTICS

As part of these PQDs, CCPs report the quantity and duration of operational failures affecting their core clearing systems over the previous 12 months on a quarterly basis, where:

- **Core Systems** enable the acceptance and novation of trades and provide the calculation of margin and settlement obligations.
- **Loss of Availability:** An incident that results in an interruption to the CCP’s ability to perform its own functions in relation to trade acceptance and novation or calculation of margin and settlement obligations. An incident that compromises the CCP’s ability to correctly perform the aforementioned functions is also considered a ‘loss of availability’, even if there is no actual outage. Failure to a back-up site without interruption to services would not count as a loss of availability.

52 CCPs, under PQD disclosure 17.4, on average reported a 99.97% core system availability for the previous 12-month period spanning January 1, 2021, through December 31, 2021. This demonstrates the high degree to which global CCPs have remained operationally resilient during the CC and were able to meet the demand of the clearing processes without the need to close operations or reduce operations.

4.3 TRANSPARENCY OF CLEARED VS. UNCLEARED MARKETS

Since the 2008 financial crisis, CCPs have undertaken a significant amount of work to further enhance the transparency of their risk management practices and are an exceptionally transparent part of the financial system, supporting an open dialogue between CCPs, participants, regulators, and standard setters. These disclosures enable any interested reader to view CCP's transaction volumes, performance statistics, financial condition, and the available financial resources to withstand potential losses. The disclosures also enable stakeholders to have a clear, accurate, and full understanding of the risks associated with a CCP and understand and assess the risks of participating in CCPs.

However, the level of transparency provided by CCPs is not replicated by CMs, which has been visible in policy evaluations and debates in the aftermath of CC. While the bank holding company of a CM typically makes disclosures consistent with local regulations that implement the BCBS's standards, these disclosures do not provide sufficient insight into the risks CMs face from their uncleared exposures, prime brokerage, and other capital markets activities. This has been noted by many authorities⁵⁴ and standards setting bodies⁵⁵ and inspired plans for further work on improvements in this area.

With that in mind, CCP12 members have prepared a concept paper for MPPQDs, which would complement regulatory statistics and those available from CCPs. In particular, under CCP12's proposal, CMs would publish quantitative data for their firm with respect to their cleared and uncleared exposures. Details of the CCP12's proposal are available in the CCP12 Response to BCBS, CPMI and IOSCO Consultative Report on Review of Margining Practices.⁵⁶

⁵⁴ ESRB, NBF1 Monitor No 6 (August 2021), p. 11: "(...) data gaps still prevent an effective risk assessment in some parts of the non-bank financial sector and some markets in which it invests, such as shortterm funding markets.", available at [Link](#)

⁵⁵ BCBS, CPMI, IOSCO, Consultative report "Review of margining practices" (October 2021), p. 3: "Attempts to map the interconnectedness between how sources of liquidity demand and supply for firms interact with key nodes in the financial system have highlighted data gaps. These gaps would need to be filled in order for authorities to gather a fuller picture of NBF1 sector liquidity preparedness and intermediaries' provision of liquidity to clients.", available at [Link](#)

⁵⁶ CCP12, Response, CCP12 response to BCBS, CPMI and IOSCO Consultative Report on Review of Margining Practices (January 2022), available at [Link](#), pages 16-20

5. THE CASE STUDIES

CCP12 members included in this year's AMR:

CCP		Case Study Title
ComDer	<i>Comder Contraparte Central S.A.</i>	<u>A short testimony of understanding counterparty credit risk, the development of Chilean markets and implementation of a local CCP in Chile</u>
CRCC	<i>Cámara de Riesgo Central de Contraparte de Colombia S.A.</i>	<u>The Introduction of a CCP in the Colombian FX USD/COP Spot Inter-Dealer Market</u>
DTCC	<i>Depository Trust & Clearing Corporation</i>	<u>Default liquidity planning for DTCC's equity clearing business</u>
Eurex + SGX	<i>Eurex Clearing + Singapore Exchange</i>	<u>Multi CCP default exercise</u>
JSCC	<i>Japan Securities Clearing Corporation</i>	<u>Risk management measures against highly volatile commodity markets</u>
JSE	<i>JSE Clear</i>	<u>Efforts to secure an Independent Clearing House Licence</u>
NSE	<i>National Stock Exchange of India Ltd</i>	<u>RegTech solutions as public goods: customer collateral protection in India</u>
SHCH	<i>Shanghai Clearing House</i>	<u>China marks a milestone in the legalization of the futures and derivatives markets</u>

6. DEVELOPMENTS AND LICENCING OF CCPS

6.1 CASE STUDY: A SHORT TESTIMONY OF UNDERSTANDING COUNTERPARTY CREDIT RISK, THE DEVELOPMENT OF CHILEAN MARKETS AND IMPLEMENTATION OF A LOCAL CCP IN CHILE (BY PABLO RODRIGUEZ, CRO, COMDER CCP)

ABSTRACT

Counterparty Credit Risk (“CCR”) for listed derivatives products had been managed for many decades using collateral in the form of margin, however, managing CCR using margin practices is relatively new in OTC derivatives products. It is fair to say that this new way to manage CCR is a consequence of the GFC and the implementation of the G20 derivatives reform, which introduced mandatory clearing for a big part of derivatives products and margin for uncleared derivatives. For this reason, understanding CCR management for OTC derivatives products has been a challenge for many markets participants and regulators.

In this case study, a personal testimony of dealing with CCR management and the struggle to implement a local CCP in Chile (a jurisdiction outside of the G20 countries) is presented. At the same time, it shows how Chile was able to experience the benefits of a local CCP during a financial crisis, like the one created during the Chilean unrest crisis (2019) and the COVID-19 crisis (2020).

6.1.1 A SHORT TESTIMONY OF UNDERSTANDING COUNTERPARTY CREDIT RISK

In the early morning of September 15th, 2008, a young market risk analyst by the name of Pablo Rodriguez based in the Canadian market, responsible for the analysis of the interest rates derivatives trading desks, was in a rush to perform an estimate of a particular area of work that he had not had experience in doing: the estimation of the total profit and loss (“P&L”) and the total sensitivity (or what is called the Dollar Value of a Basis Point (“DV01”) of the portfolio) of an isolated counterparty, to be specific – the Lehman Brothers’ portfolio.

For the analyst, it was the very first time to be presented with such a task. According to the market risk analysis manual (also known informally as the “Market Risk Bible”), the P&L and the DV01 exposure of a specific trading desk had to be estimated and reported daily in consolidated terms (not by counterparty). The trader responsible for the respective desk had to sign such a report for confirmation. However, for that particular morning it was different since the Lehman Brothers’ portfolio was isolated from the remaining portfolios.

Of course, the report presented to the head trader that morning was not usual because the trading portfolio was split in two. Consequently, the analyst presented the portfolio’s P&L report (without Lehman positions) with a monumental loss since the Lehman portfolio was deeply in the money that day and the portfolio’s DV01 report (without Lehman positions) had a large exposure. As protocol would dictate, the analyst requested the head trader to sign both reports and recommended that the traders close the DV01 exposure with immediate effect. The head trader replied so bitterly to the young risk analyst that it took some time for the analyst to understand why he had received such a reply.

As years passed and working as the CRO at the newly created Chilean CCP ComDer, Pablo was able to understand why the trader had responded with such severity back on that morning in 2008. The reason for his behaviour was that the analyst had crossed the (apparently thin) line between market risk management and counterparty credit risk management.

At the moment that the Lehman portfolio was isolated, and the analyst’s recommendation was to close the Lehman portfolio risks, the analysis reported was no longer a market risk report, it was closer to a counterparty

credit risk report (which at that time the head trader was not in charge of). Furthermore, the recommendations to reduce the DV01 exposure (which is similar to re-establishing a matched book) were closer to counterparty credit risk management recommendations than to market risk management recommendations.

A short recap of the definitions of these risks would be as follows:

- The market risk analysis of an interest rate portfolio is performed at the level of an aggregate portfolio where P&L movements of such books are driven by the change of market risk factors (similar to yield curve movements) and the size of the portfolio exposure (or DV01 exposure);
- Counterparty credit risk is a complex risk to assess because it is a hybrid between credit and market risk and depends on both changes in the creditworthiness of the counterparty and movements in underlying market risk factors, and in the case of Lehman you were able to face it (or really feel the pain) after the default of the counterparty.

At the time of the default of Lehman Brothers, it was a general belief that the probability of a default of a large international financial institution was very slim. Therefore, the counterparty credit risk management of a large bank was performed mainly through the granting of a derivatives credit risk line. The size of these credit lines were decided on the basis of the present and potential future exposure of the counterparty derivatives portfolio, and the risk appetite of the institution granting the line.

Of course, this is currently no longer the way to deal with these risks due to the fact that large global banks already implemented counterparty credit risk management at the business level through X-Value Adjustment (“XVA”) desks and Collateral desks. The same is true for Chile where large domestic banks implemented these kinds of trading desks. However, this belongs to a different chapter of the development of the Chilean financial markets.

In summary, Lehman Brothers declared itself in bankruptcy, the 2008-2009 GFC hit almost all developed nations, and the G20 committed to implement big regulatory reforms:

- **Basel III:** to improve the resilience of the international banking system and impose higher capital as well as margin requirements for non-centrally cleared transactions; and
- **The Derivatives Market Reform:** to reform the OTC derivatives market by mandating central clearing for standardized OTC derivatives and, where appropriate, exchange or electronic trading of standardized OTC derivatives, as well as reporting of all transactions to trade repositories.

In practical terms, counterparty credit risk management changed completely after the implementation of the G20 reforms, moving away from granting credit lines and essentially absorbing default losses through capital in the case of the default of a counterparty, to collateralize the counterparty credit risk exposure – under extreme but plausible scenarios – through the inclusion of variation margin, initial margin, and default (or guarantee) funds.

6.1.2 WHAT HAPPENED IN CHILE – WHEN NO DEFAULT MEANS A LOT OF DIFFICULTIES TO UNDERSTAND THE MEANING OF COUNTERPARTY CREDIT RISK

Fortunately, the Chilean financial system was not hit hard during the GFC and no financial institution was declared in default during this period. In fact, the Chilean financial system has been very fortunate (without bank defaults) since its last major crisis, the Latin American debt crisis at the beginning of the '80s, where the Chilean government made a major intervention in the financial system at a taxpayer cost of 35.2% of the GDP.

As in any financial crisis, in the aftermath of the debt crisis, Chilean regulators implemented tough regulations that allowed the banking system to grow healthily in the following years. One of these regulations was the large exposure limit, which limits the largest amount of the credit exposure that a bank can face to any conglomerate to 10% of the capital.

These 40+ years without defaults in Chile showed that the use of credit lines to manage the counterparty credit risk of derivatives was well suited to all Chilean banks till the beginning of the last decade. However, one of the main components of Chilean banking regulation gave the Chilean Central Bank more attributes to intervene in a failing financial institution, with a negative consequence: an ISDA negative netting opinion on derivatives products due to the attribution of the Central Bank.

After the GFC, the Chilean derivatives market experienced important growth which gave rise to an issue with the large exposure limit (full utilization of the credit line mainly because of the lack of a positive legal netting opinion). Furthermore, top Chilean officials and top management at local banks were aware of the G20 derivatives market reforms and the importance to have a derivatives CCP in the Chilean jurisdiction that can incorporate the best standards to manage counterparty credit risk. All this led to the creation of ComDer.

6.1.3 THE BIRTH OF COMDER CLEARING HOUSE

In 2009, Chile passed a national law (law 20.345) that set the principles and rules for the incorporation of Central Clearing Houses in Chile. One of the many positive consequences of this law was that the Central Bank of Chile recognized that financial products cleared in a CCP under the 20.345 law can obtain a positive netting opinion (the Chilean Central Bank later amended the regulation for bilateral trades, which let ISDA grant a positive netting opinion for bilateral trades in 2019).

With this new law in operation, a consortium of Chilean banks decided to proceed with the creation of a local CCP in 2011. In the following years, ComDer was created, and partnered with Calypso (now Adenza), one of the world's leading financial software providers, to be ComDer's full technological solution (front-to-back). Later in the case study, we will explain the importance of this decision for ComDer.

ComDer started its operation in July 2015, with 13 CMs, and since its inception, the Chilean banks largely use ComDer to clear their derivatives (mainly inflation and FX derivatives). However, it is important to mention that in the implementation of a local CCP counterparty credit risk management was not a significant concern for local banks (especially for local trading desks) because of the lack of bank defaults in the last 40 years, as we mentioned earlier, and the granting of derivatives credit lines.

During the first years of ComDer's operations, due to collateral requirements, the cost of clearing was the main complaint received because it was not custom for banks to post variation and initial margin or contribute to a default fund for that matter. It is important to mention that Basel III capital requirements were not yet in place in Chile (Basel requirements were implemented in Chile in 2021).

Overall, ComDer revolutionized the way Chilean banks managed counterparty credit risk, moving away from granting derivatives credit lines to other banks to the inclusion of posting collateral to ComDer.

With regards to operations, ComDer was largely an improvement in the local market due to the full implementation of Calypso thanks to which it experienced a perfect track record of operational activities, eliminating settlement disputes among the banks. Additionally, the netting effects in risk exposure and settlements payments were substantial enough for the CMs to remain at ComDer. This provided ComDer with an advantage in the local market and an important recognition for excellence in its daily operation.

Nevertheless, the lack of clearing incentives in Chile such as mandatory clearing, uncleared margin rules, and even capital benefits, in addition to 40+ years of no banks' defaults, created a difficult environment to sell the importance of managing counterparty credit risk in a CCP to banks, and especially to trading desks at the banks.

This is also true because understanding counterparty credit risk management is not an easy feat hence it is important to reflect on real events which were experienced by Pablo during his tenure in the Canadian market. It is vital to remember that Chile is a country outside of the G20 jurisdictions, and as a result, these market reforms are fairly new.

6.1.4 THE CHILEAN UNREST CRISIS AND THE COVID-19 CRISIS

As mentioned previously in the case study, the Chilean market experienced 40 years without critical situations, which translated to a relatively low market volatility and no bank defaults. This came to an end in October 2019, as a result of a social explosion that started with an increase in the public transport tickets' prices. This unrest situation quickly escalated and evolved in a profound political and social crisis.

After an unprecedented Central Bank intervention in the market, and a political agreement to change the Chilean Constitution, the market started to return to normality, but this was the first real test for ComDer and the new way to manage counterparty credit risk.

First, and because of the existence of ComDer, banks did not have to cut credit lines with other banks (there was no reason since ComDer is the only counterparty in the market, with an *essentially* AAA rating). This allowed the Chilean banks to continue having their regular liquidity in the derivatives markets, without experiencing the typical market freeze in this kind of a situation.

Second, banks did not increase counterparty credit exposures, mainly because of the daily variation margin calls. Also, because of the high volatility, many intraday margin calls were requested to CMs, and in all the cases they were settled in less than 30 minutes.

Third, no operational failures or disputes occurred during this first crisis, which gave the bank CMs the trust that they do not have to worry about facing other difficult operational situations.

Fourth, and due to the role of the CCP, there was quality information flow to the regulators to support their financial decisions.

In March 2020, the world entered into the COVID-19 pandemic just when Chile was getting out of the problems created by the unrest situation. Consequently, the Chilean market faced the same volatility issues as the rest of the world was facing due to the COVID-19 Crisis. It is fair to state that the CC hit Chile as hard as the unrest crisis and caused the same kind of market volatility and uncertainty issues as described before.

The summary of the two crises is this: for a country like Chile, having a CCP is fundamental to dealing with the market uncertainty because of the reduction of counterparty credit risk and the increase in market information available to the regulators and the market itself. It is unquestionable that all the benefits that we mention here would be instrumental to properly manage a default in the CCP and would increase the probability of re-establishing a matched book very quickly.

A summary of all these benefits ties in well with what the Former Minister of Finance, and now a member of the ComDer's Risk Committee, Rodrigo Valdés used to say: "ComDer allowed the country to experience the importance to have the benefits of a first world-class market infrastructure in a developing country."

However, both crises reveal an important issue that needs to be addressed in the near future in the Chilean capital market which is a lack of a repo market.

6.1.5 THE FUTURE OF CLEARING IN CHILE: THE DEVELOPMENT OF THE REPO MARKET

Chile has been very fortunate with the timing of the financial system assessment done by the IMF. In particular, the IMF performed its last Financial Sector Assessment Program between 2020 and 2021, exactly during the two worst Chilean financial crises of the last 40 years.

In November 2021, the IMF completed its assessment and one of the conclusions drawn was that mutual and pension fund redemptions during 2019 and the subsequent Chilean Central Bank measures taken in both crises (unrest and CC), used to relieve the impact of the shocks, highlighted some structural liquidity risks that needed to be addressed.

The IMF commented that, despite a well-developed capital market, an institutional repo market does not exist in Chile, as banks prefer exchanging liquidity on an unsecured basis, with the central bank serving as the backstop. It also observed that setting an appropriate risk/reward and regulatory incentives to develop this market should be a policy priority in the next couple of years. For this reason, the IMF recommended strengthening of the liquidity management framework for mutual funds and the development of the interbank repo market.

It is interesting to observe that this recommendation is done while market stakeholders are pushing to expand the benefits of central clearing into the US Treasury repo market.

As people use to say: timing is everything in life and it looks like the timing for the clearing of repos could be knocking on the door also in Chile. At least we believe that all the benefits of clearing, especially during a financial crisis, and at a time when the Chilean government needs to increase the government bond issue to attend to all the new social demands, could be helpful in the development of a resilient repo market.

To conclude, at ComDer we were able to experience many different benefits that a country enjoys when it has a local derivatives CCP, especially during markets crises, despite the lack of clearing incentives like mandatory clearing, uncleared margin rules, and capital benefits. For this reason, we believe that clearing benefits are going to be translated in the future to new markets, like the repo market. We should also be able to expand the benefits of clearing outside the interbank dealing market into, for example, mutual funds, pension funds, and other institutional investors.

6.2 CASE STUDY: THE INTRODUCTION OF A CCP IN THE COLOMBIAN FX USD/COP SPOT INTER-DEALER MARKET (CRCC'S PERSPECTIVE)

ABSTRACT

The USD/COP Spot market in Colombia has an average traded volume of over 1.5 billion per day. Until early 2021, this market operated under a clearing mechanism that allowed multilateral netting of cash balances in COP and USD, but without a CCP. Despite the benefits provided by multilateral netting through FX Clearing House ("FCH"), the lack of a CCP in this market generated two undesired outcomes. On the one hand, each member was required to assign credit facilities to those counterparties it was willing to trade with, and, on the other hand, there was no anonymity, as members knew who their counterparty was in each trade. The need for credit facilities caused asymmetry in the access to execution prices, as both the seller and the buyer needed to have enough facilities among them to trade. Since having two CCPs in Colombia was not economically efficient, in 2019 FCH and CRCC decided to merge under the existing CRCC structure so that FCH would cease to exist, and the local FX USD/COP Spot market could become a new segment within the CRCC, receiving all the benefits of a CCP. This eliminated the undesired effects mentioned above, generating further cost efficiencies to CMs. We will use a network analysis to assess whether the elimination of credit facilities between members in the FX USD/COP Spot market derived from the introduction of the CCP resulted in a more accessible market for all members, regardless of their size and overall creditworthiness and whether the expected synergies could be passed on to participating members.

The Colombian FX USD/COP Spot inter-dealer market is the place where local institutions (e.g.: banks and brokerage houses), legally authorized by the Central Bank as foreign exchange intermediaries, buy and sell US Dollars against Colombian Pesos with settlement in T+0. As of March 2022, this market segment has an average daily turnover of USD 1.5 billion, and 31 participating dealers which trade by providing prices directly to third parties (e.g.: corporations, individuals) and/or by taking positions in their proprietary accounts.

As early as 2002, the Colombian Central Bank and market makers began working on an initiative to implement multilateral netting agreements to mitigate exposures from gross settlement practices among them and generate further efficiencies in cash balances of both USD and COP to settle trades. As a result of this initiative, the FX Clearing House was officially established in 2006, which went live in 2007.

FCH was not designed to function as a CCP, but rather as an instrument to allow multilateral netting in USD and COP among members at the end of each trading session, with bilateral exposure and the requirement to maintain specific credit facilities among trading members. This implied that members were free to determine their own risk appetite with other members, therefore, setting credit facilities accordingly. Since there was not a direct mandate from the Central Bank or any other local regulator to settle trades through FCH, it was up to each member to decide whether to trade through the FCH or to trade bilaterally with gross settlement.

With the advent of the GFC in 2008, the benefits of multilateral netting became even more relevant, and in 2009, the Colombian Central Bank required market makers to settle all their FX USD/COP trades through FCH. This represented a major milestone in the market, and in a short period, over 99% of daily volume was being settled by the FCH. A few months before the GFC, the Colombian Central Counterparty Clearing House (CRCC) was launched, and by 2009, there were two clearing houses operating in the local market. FCH, which was not a CCP but was designed to operate exclusively in the FX USD/COP spot market, and CRCC who performed the role of a CCP in the local futures market.

During the next decade (2009-2020) there was a significant consolidation process, as international standards resulting from the GFC were gradually adopted in Colombia, and as the use and need of clearing houses became the norm worldwide. CRCC grew in the number of markets and products cleared, whereas FCH consolidated its business model.

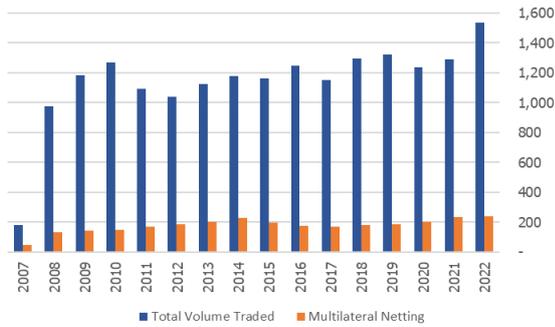


Figure 6-1: FCH Daily Average Traded and Settled (USD B)

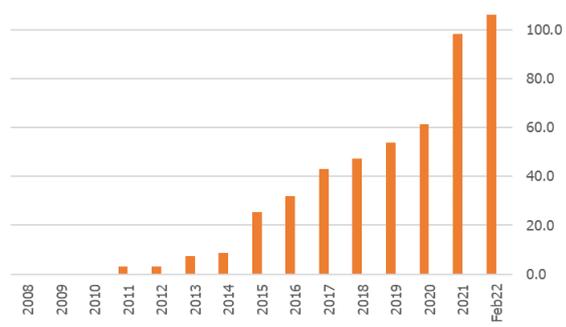


Figure 6-2: CRCC Daily Open Position

Despite the benefits provided by multilateral netting through FCH, the lack of a CCP in this market generated two undesired outcomes. On the one hand, each member was required to assign credit facilities to those counterparties it was willing to trade with, and, on the other hand, there was no anonymity, as members knew who their counterparty was in each trade. The need for credit facilities caused asymmetry in the access to execution prices, as both the seller and the buyer needed to have enough facilities among them to trade. This in turn, was a main concern for smaller members who were not always able to trade at the best price available in the market, losing efficiency in the execution process. Another concerning aspect was the unlikelihood to maintain anonymity when accessing the market, especially when a member was handling a large flow and wanted to prevent other members from noticing this, to avoid price shifting against the trading member.

By the end of 2018, it was evident that if FCH operated as a CCP, the market could benefit significantly. However, the CRCC was simultaneously, already fully operative clearing most of the local over the counter and exchange-listed markets. Since having two CCPs in Colombia was not economically efficient, in 2019 FCH and CRCC decided to merge under the existing CRCC structure so that FCH would cease to exist, and the local FX USD/COP Spot market could become a new segment within the CRCC, receiving all the benefits of a CCP. This eliminated the undesired effects mentioned above, generating further cost efficiencies to CMs.

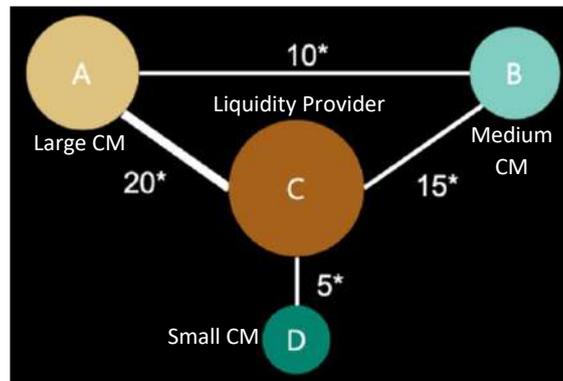
In 2020 amid COVID-19, both entities worked closely with market members, the Colombian Central Bank and the Colombian Banking Regulator, to obtain all the approvals required for the merger and to start clearing operations in this market. This process was completed successfully, and, in December 2020, the merger of FCH and CRCC took place with the go-live target date set for February 1st, 2021. The FX USD/COP Spot market became the fifth Segment cleared through CRCC aside from its already existing Fixed Income, Derivatives, Equities, and Swap Segments.

Segment	Derivatives	Fixed Income	Equities	Fx Spot	Swaps
Risk Model	MEFFCOM2				H-VaR

Figure 6-3: CRCC Cleared Segments

Over a year after the FX USD/COP Spot market went live under a CCP structure through the CRCC, we can now assess whether CMs are reaping the benefits expected from the elimination of bilateral credit facilities and the introduction of a blind-market.

We will use a network analysis to assess whether the elimination of credit facilities between members in the FX USD/COP Spot market derived from the introduction of the CCP resulted in a more accessible market for all members, regardless of their size and overall creditworthiness. The network consists of nodes which represent CMs (large, medium, small, and liquidity providers), and arcs which represent interactions among members. An interaction is produced whenever two members enter at least one transaction on any given market session. The network's color conventions are denoted as follows:



*: # of days an interaction took place

Figure 6-4: Network Structure

To determine whether the network’s connectivity increased, we looked at a two-graph analysis. The first one is based on a perfect circular distribution, where we look at the number of arcs for smaller members before and after the introduction of the CCP and determine whether the number of arcs increased, indicating a more accessible market. In a more general description, the smaller the black area within the circular distribution, the better. If we look at the average circular distribution of the FX USD/COP Spot market before the introduction of the CCP, we have the following pattern:

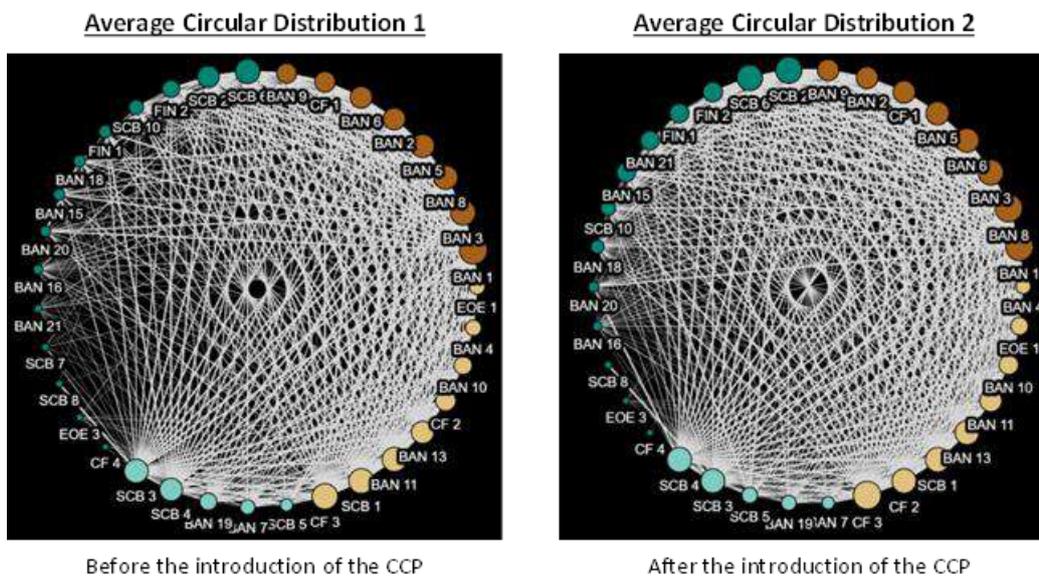


Figure 6-5: Average Circular Distributions 1 & 2

If we look at the Average Circular Distribution 1, we observe that, on the left-hand side, the black spaces are larger than on the other parts of the graph, which is consistent with the fact that smaller members were at a disadvantage in accessing the market, due to the bilateral credit facilities requirement that were not necessarily symmetric. This profile is typical for an over-the-counter market with settlement at end of the day.

However, if we now compare Average Circular Distributions 1 and 2, we observe that due to the introduction of the CCP, the black areas in the left-hand side of Circular Distribution 2 decreased substantially in relation with Circular Distribution 1. This new profile confirms that the elimination of bilateral credit facilities under a CCP structure allowed all CMs, regardless of their size, to have equal access to the market, therefore increasing the number of interactions among them.

A second alternative distribution to analyze the network effect of the introduction of the CCP is commonly known as ForceAtlas, which simulates a physical system in order to spatialize a network. Nodes repel each

other like charged particles, while edges attract their nodes like springs. A perfect network would yield a perfect spherical distribution; whereas an imperfect network would have those members with the largest number of interactions grouped in the center, and those members with the least number of interactions in the periphery. When comparing the average ForceAtlas distribution before the introduction, and 12 months after the introduction of the CCP, we find the following patterns:

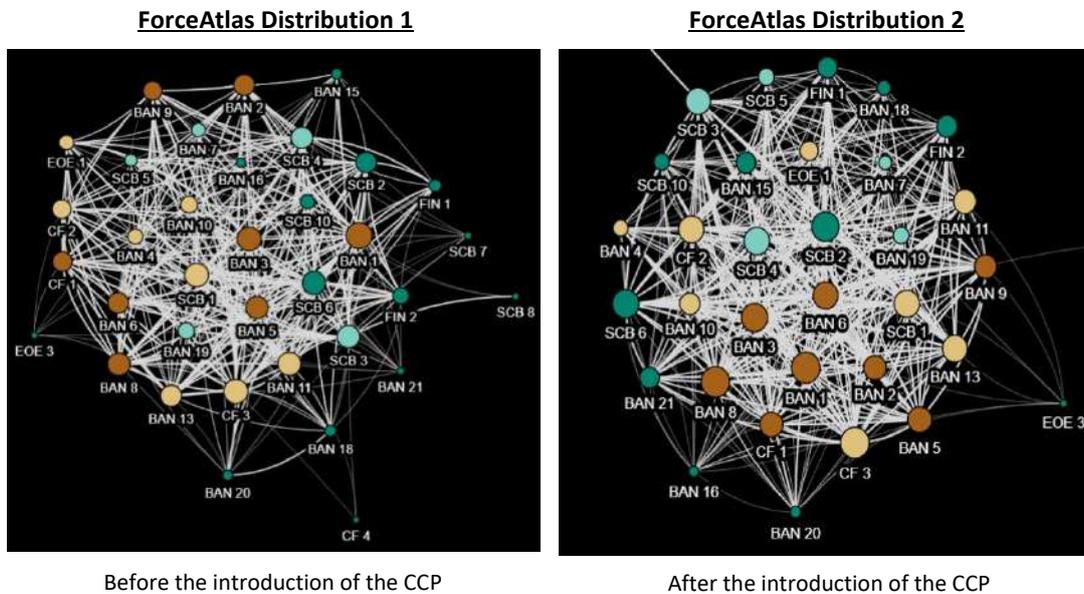


Figure 6-6: ForceAtlas Distributions 1 & 2

This technique allows for a visual interpretation of the network’s structure, where members have more relations inside their community (e.g.: closer to the center) than outside (e.g.: closer to the periphery). Ideally, more connected networks are expected to show denser relations and equal market access.

If we compare ForceAtlas distributions 1 and 2 after the introduction of the CCP, there was a clear overall shift of members towards the center of the distribution assuming a more spherical shape. It is critical to point out that those members that appear further apart on the periphery in the ForceAtlas Distribution 2 are distinctive, in the sense that they access the market once a month and for very specific purposes. Again, the analysis shows that the introduction of the CCP in the Colombian USD/COP Spot inter-dealer market increased market access across CMs and mostly across the smaller ones.

The introduction of the CCP in the FX USD/COP Spot inter-dealer Colombian market and the resulting elimination of bilateral credit facilities have consistently improved market efficiency by ensuring all CMs unrestricted access to the best execution prices. In addition, the existence of a CCP has also allowed for a blind market structure, where CMs can easily handle large flows without the market perceiving it.

Moreover, the merger of FCM and CRCC allowed to transfer to CMs the synergies obtained by reducing clearing fees, further improving the efficiency of the market.

6.3 CASE STUDY: EFFORTS TO SECURE AN INDEPENDENT CLEARING HOUSE LICENCE (JSE CLEAR'S PERSPECTIVE)

ABSTRACT

In 2012, the Financial Markets Act ("FMA") replaced the outgoing Securities Services Act of 2004 ("SSA"), to become the primary legislative instrument regulating the activities of exchanges and clearing houses operating in South Africa. The promulgation of the FMA introduced a new licencing construct for local clearing houses – namely the concept of an Independent Clearing House ("ICH") – and a further piece of legislation (2018's Financial Sector Regulation Act) introduced the obligation that any clearing house that wished to be licenced as a CCP would also have to secure an ICH license by no later than 1 January 2022. As the only recognised CCP operating in South Africa, JSE Clear undertook a 4-year programme of work to be licensed as an ICH.

This case study provides an overview of the different characteristics that define an Independent Clearing House in terms of South African law, and describes the process undertaken by JSE Clear to secure its ICH licence – both in terms of the engagement model with local regulators during the application process, as well as the changes introduced to the clearing house's operating model in order to satisfy the new licencing requirements.

6.3.1 INTRODUCTION TO JSE CLEAR

JSE Clear is a wholly owned subsidiary of the JSE Limited (the largest securities exchange in Africa), and currently operates as the only licensed clearing house for exchange traded derivatives in South Africa. Formally known as SAFCOM, JSE Clear has been providing clearing and settlement services for over three decades and has achieved a number of milestones in that time – most notably becoming one of the first clearing houses in the Southern hemisphere to be certified as an IOSCO Qualifying CCP (in 2012), as well as achieving formal recognition as a third-country CCP from ESMA in 2016.

6.3.2 TRANSITION FROM AN ASSOCIATED TO AN INDEPENDENT CLEARING HOUSE LICENCE

JSE Clear has been licensed as an "Associated Clearing House" ("ACH") by our primary licencing authority, the Financial Sector Conduct Authority ("FSCA"). An ACH is defined within South Africa's Financial Markets Act 19 of 2012 as "a clearing house that clears transactions in securities on behalf of one or more exchanges in accordance with the rules of the relevant exchange and that does not approve or regulate CMs". As such, under its ACH license, JSE Clear has been appointed as the clearing house and CCP for all transactions in listed derivatives concluded on the JSE's markets.

The ACH licencing construct means that there exists an inherent link between the clearing house and the trading venue it provides clearing services to – a level of interconnectedness that has been perceived as increasingly problematic in South Africa's highly concentrated market. Concerns regarding such heavily intertwined systemically important institutions has prompted our regulators to revise local legislation, and to introduce a new licencing construct for clearing houses operating in our market, namely the concept of an "Independent Clearing House". An ICH differs from an Associated one in that it can provide clearing services to multiple exchanges, but does so in terms of its own rules, and is responsible for admitting and supervising its own CMs. Additionally, an ICH would be required to have a greater degree of structural autonomy than an ACH would, with independent capabilities to fulfil its functions as a licensed clearing house.

Although the concept of an ICH was first introduced in 2012 via the aforementioned FMA, a subsequent piece of legislation – the Financial Sector Regulation Act (which came into effect in 2018) - made consequential amendments to the FMA, doing away with the ACH licencing construct and introducing the obligation for all local clearing houses to secure separate ICH and CCP licenses by no later than 1 January 2022.

6.3.3 TENETS OF THE INDEPENDENT CLEARING HOUSE

Section 50 of the FMA specifies the primary functions that an ICH must fulfil as part of its licensed responsibilities. In its most simplistic form, an ICH is required to:

- Issue and enforce its own rules;
- Establish independent governance bodies to oversee the activities of the CCP;
- Institute a capital management programme aligned with regulatory requirements;
- Provide a robust infrastructure for the clearing of securities;
- Put in place appropriate mechanisms for the effective management of risk in relation to the clearing and settlement of transactions;
- Set up appropriate governance for the protection of prefunded resources;
- Supervise CMs’ compliance with the CCP’s rules and other applicable regulations;
- Supply regulators with timely and pertinent information when required (relating to systemic risks, CM exposures, etc.).

While the regulations set out the high-level requirements that an applicant for an ICH would be required to fulfil, the regulators still needed to provide a set of exact conditions or criteria that would be used to assess an applicant’s true eligibility to be granted the licence. This explicit set of licencing requirements was provided to the market in early 2021 and specified the exact information and artefacts that applicants would have to provide as a part of their licence applications. Additionally, as local clearing houses would be required secure both ICH and CCP licenses separately, regulators provided an additional set of licencing requirements for CCP licence applications.

6.3.4 JSE CLEAR’S PROCESS FOR APPLYING FOR ITS ICH AND CCP LICENSES

JSE Clear’s efforts to secure its required ICH and CCP licenses took a two-pronged approach: The first area of focus centred around *the work required to compile our formal licence application*, which involved the documentation of a host of information describing the various business and technical operations of the clearing house, as well as the collation of numerous documents (policies, frameworks, processes and methodologies) which govern how the clearing house undertakes its various activities. The primary objective of these application inputs was to provide the regulators with documented evidence that JSE Clear sufficiently meets the requirements of a licensed clearing house and CCP. JSE Clear’s final licence application consisted of over 200 documents, the printed versions of which filled nine large lever arch files (applicants were asked to make their submissions in both electronic and physical format).

The second area of focus centred on *changes that needed to be made to JSE Clear’s operating model*, to either make it more aligned with the licensing requirements, or to address specific gaps identified during the application submission process. As JSE Clear has historically operated as a fully licensed CCP, very few changes were required to its clearing and settlement or risk management processes – instead, much of the effort centred on activities to create a more distinct “separation” from its parent organisation, the JSE. While operating under its ACH licence, the JSE Clear legal entity was permitted to wholly rely on the JSE for the provision of its various licensed functions, while the transition to an ICH meant that JSE Clear would now have to have its own resources (human, financial, and technology) to facilitate its core functions, as well as the requisite outsourcing arrangements to fulfil those peripheral CCP functions that are deemed non-core (i.e. unrelated to formal licence obligations). Furthermore, JSE Clear undertook further changes to its governance

structures to ensure that its Board and Risk Committee constitutions satisfied the requirements for independence.

While the two elements of the licence application process were run in parallel, implementation of the required operating model changes were dealt with as either (i) changes that needed to be completed in time for the submission of our application vs. (ii) changes that needed to be completed in anticipation of the granting of the licence (the latter typically being the more substantial operating model changes that would be difficult to roll back should the licence application be unsuccessful).

6.3.5 REGULATORY ENGAGEMENT

A vital component of the licence application process was regular and focused consultation with our local regulators. Although the aforementioned FSCA is the licensing authority for clearing houses, such licences have to be granted in concurrence with our *Prudential Authority*, as well as our Reserve Bank's *Department for Financial Stability*. Aware of 1st January 2022 licencing deadline, JSE Clear initiated discussions with all three authorities a number of years ago, in an effort to confirm the appropriateness of the CCP's to-be operating model design (while the authorities stressed that they could only opine on the final contents of the licence application, we hoped to test which elements of the proposed operating model design would be specifically problematic for the regulators, prior to implementation). Engagement continued up to the point of licence submission, as well as post, where JSE Clear representatives have made themselves available to respond to any queries that the respective authorities may have regarding the application contents.

6.3.6 CURRENT STATUS OF THE APPLICATION

As mentioned, the deadline by which all South African clearing houses were required to secure ICH and CCP licenses was 1st January 2022. After the authorities published the final licencing requirements in April 2021, JSE Clear submitted its formal licence applications in June 2021 – meaning that six months remained during which the application could be reviewed and approved.

In December 2021 the authorities issued a notice informing the market that JSE Clear's current ACH licence would be extended by a year, effectively giving JSE Clear a dispensation from the ICH deadline. The extension gives the Authorities additional time to complete their review of the various inputs that make up JSE Clear's licence submission, and we are confident that the process will be concluded well before the new deadline date. To date, no other licence applications have been submitted to the authorities, so if JSE Clear is successful in its application process, it will remain the only licensed CCP operating in South Africa.

7. DEFAULT MANAGEMENT AT CCPS

7.1 CASE STUDY: DEFAULT LIQUIDITY PLANNING FOR DTCC'S EQUITY CLEARING BUSINESS (DTCC'S PERSPECTIVE)

ABSTRACT

In further support of the goal to protect the financial markets, this case study shows how the NSCC has continued to strengthen its liquidity risk management strategy over time, including growing and diversifying its liquidity resources.

As a CCP, NSCC's liquidity needs are driven by the requirement to complete end-of day money settlement, on an ongoing basis, in the event NSCC ceases to act for a member. NSCC seeks to maintain qualifying liquid resources in an amount sufficient to cover this risk. These resources historically included cash deposits and a credit facility, and they have expanded to include debt issued to support default management and Supplemental Liquidity Deposits ("SLDs"). SLDs improve NSCC's ability to measure and monitor its daily liquidity exposures and allow it to collect additional qualifying liquid resources from Members whose activity poses the largest liquidity exposure to NSCC in connection with their daily settlement activity.

The National Securities Clearing Corporation is a wholly owned subsidiary of The Depository Trust & Clearing Corporation ("DTCC"), which provides CCP services to its customers with respect to securities transactions in equities, corporate bonds, municipal securities, and unit investment trusts in the US. DTCC is user owned and governed. NSCC is a clearing agency registered with, and under the supervision of, the SEC. In July 2012, NSCC was designated as a systemically important financial market utility ("SIFMU") under Title VIII of the Dodd-Frank Act by the Department of Treasury's Financial Stability Oversight Council, obliging it to meet certain risk management regulatory standards.

NSCC's core services are trade capture through its Universal Trade Capture system, and clearance and settlement through its Continuous Net Settlement System. Trade capture, the first step in the clearance and settlement process, involves the daily receipt of trade data from over 50 trading venues in the United States, including all U.S. securities exchanges and alternative trading facilities, and from NSCC Members submitting transaction data directly. That data is then compared or recorded. Trade comparison consists of validating and matching the buy and sells sides of a securities transaction, and results in a compared trade that is reported to members. Today over 99 percent of trade data is submitted to NSCC on a "locked-in" basis, meaning that it is already compared by the marketplace of execution.

NSCC, along with its affiliates, Depository Trust Company and Fixed Income Clearing Corporation, maintain a Clearing Agency Liquidity Risk Management Framework ("Framework"), which sets forth the manner in which NSCC measures, monitors and manages the liquidity risks that arise in or are borne by it. As a CCP, NSCC's liquidity needs are driven by the requirement to complete end-of day money settlement, on an ongoing basis, in the event NSCC ceases to act for a member (hereinafter referred to as a "default"). If a member defaults, NSCC needs to complete settlement of guaranteed transactions on the defaulted member's behalf from the date of default. NSCC measures the sufficiency of its qualifying liquid resources through daily liquidity studies across a wide range of scenarios, including amounts NSCC would need in the event the member or member family with the largest aggregate liquidity exposure defaults.

7.1.1 LIQUIDITY EXPOSURE FLUCTUATES

On a daily basis, NSCC monitors settlement flows and projected debit obligations from its members' clearing activity. Each member's incoming credits and debits are reviewed to estimate the size of cash outflow required to satisfy settlement needs. In addition, automated risk systems are utilized to measure and monitor potential

liquidity demands. In the event an NSCC member defaults on its open obligations, NSCC's liquidity needs are driven by whether the defaulted member has satisfied its unsettled obligations on the day of default, plus the settlement amount of the defaulted member's net long (buy) positions for each future settlement day.

To the extent that a member's open portfolio to be closed out is "net-long", NSCC is responsible for the receipt of securities from, and payment of cash to, the contra side members. As such, long (receive) positions drive the potential liquidity risk that is posed to NSCC, since NSCC would be responsible for the payment of cash required to settle those purchases.

Accordingly, NSCC calculates its liquidity needs per individual member at a legal entity-level and further aggregates amounts at the family-level (that is, including all affiliated entities that are also NSCC members, under the assumption that all such affiliates fail simultaneously). Members' total liquidity needs are calculated by netting the sum of contract values for all securities on a per Committee on Uniform Security Identification Purposes ("CUSIP") / International Securities Identification Number ("ISIN") basis per member (that is, to determine the member's net long or short position per CUSIP/ISIN) for each day of the cycle and summing the total of the debit (long) positions only. These positions represent the securities that NSCC would have an obligation to receive and pay for in the event of a member default.

The stressed market conditions NSCC assumes in its calculation include, but are not limited to,

1. the simultaneous default of all members of the affiliated family, without prior warning, with the largest aggregate settlement obligations;
2. on the day of assumed default, the members of the largest affiliated family are trading at peak historical trading levels and no market participants curtail their activity with any members of the family; and
3. leading up to or after the default, there is no increased volatility in the market that would result in a significant increase in aggregate margin requirements, mark-to-market collections, or other risk-based premiums that would have the result of increasing NSCC's liquidity resources.

NSCC also applies stresses to its liquidity resources to account for extreme but plausible scenarios that could limit its available resources.

A substantial proportion of NSCC's default liquidity need is attributable to the exposure presented by those unaffiliated members and affiliated families that regularly incur the largest gross settlement debits over a settlement cycle, either during times of normal activity as well as during times of increased clearing activity that arise around high-volume days and options expiration dates. In the last 5 years, NSCC's peak Cover-1 liquidity need increased above the average Cover-1 exposure by 1.8 times during high-volume days and by 2.45 times during options expiry. In addition to the material increase in liquidity exposure, these days occur infrequently, and they collectively only represent about 15% of the business days per year.

This material change requires significant client engagement to anticipate potential exposure changes, and as outlined later in the case study, a set of financial resources that can adjust to increased exposure.

7.1.2 CLIENT ENGAGEMENT

NSCC conducts daily surveillance of its members and the broader market. During periods of market volatility and/or increases in clearing activity, NSCC conducts bilateral meetings with its members to understand exposure trends and determine potential impacts on the sufficiency of NSCC financial resources. NSCC also has a daily information exchange with the Options Clearing Corporation ("OCC") on both actual and projected options settlement exposures. Changes in intraday exposure are also evaluated and escalated as necessary. These dialogues have become routine, and often members will also reach out in advance of higher activity.

Processes and requirements are adapted as risk management and initiatives evolve. Implementation of certain initiatives will require changes to NSCC's rules. In order to provide transparency and discussion, NSCC will consult with key stakeholders via forums, industry groups, white papers, and/or webinars, as well as individual outreach, as appropriate.

In 2013, DTCC established a standing member-based advisory group, the Clearing Agency Liquidity Council ("CALC"), as a forum for the discussion of liquidity and liquidity-related financing needs and trends. DTCC typically conducts quarterly CALC sessions that examine the liquidity drivers, discuss resource planning, and explore liquidity alternatives. Attendees include senior leaders from the NSCC Membership and Securities Industry and Financial Markets Association ("SIFMA") that represent risk management, finance, operations, and legal disciplines.

7.1.3 LIQUIDITY RESOURCES HAVE EVOLVED

As described in the Framework, NSCC seeks to maintain qualifying liquid resources in an amount sufficient to cover this potential default risk. NSCC does not have access to routine credit at the central bank for liquidity; as such, it does not account for this option in its liquidity planning.

NSCC's Rules specifically permit borrowing from the aggregate member margin accounts (herein "Clearing Fund") to facilitate end-of-day money settlement. Additionally, Clearing Fund collateral may be pledged for the purpose of securing loans to complete settlement.

Additionally, NSCC has arranged a committed credit facility with a syndicate of banks for default liquidity. These resources are also available on a same-day basis. If drawn upon, the credit facility is collateralized with eligible Clearing Fund Securities and the securities in the process of settlement which, as a result of the defaulting member's failure-to-settle, are received and paid for by NSCC, or collateral supporting these positions. The credit facility is renewed annually.

As NSCC's Cover-1 liquidity needs increased and these exposure changes were not uniform across the membership, NSCC felt that it was appropriate that those members with the highest exposures provide additional prefunded liquidity resources to NSCC. In 2014, NSCC implemented the requirement for its largest members to provide additional liquidity in the form of Supplemental Liquidity Deposits to the Clearing Fund to cover the largest exposures arising around option expiry periods where NSCC has historically had the largest liquidity exposure. This rule was ultimately modified in 2021 to cover all business days. It allows the daily collection of SLD from those members whose daily activity would, in the event of their own default, create a potential liquidity need that is in excess of NSCC's available qualifying liquid resources. This helps mitigate the risk that could arise if exposure significantly increased in a short period of time and existing liquidity resources are not sufficient.

In 2015, NSCC established a Prefunded Liquidity Program in order to raise prefunded liquidity and diversify its liquidity resources through the private placement of unsecured debt, consisting of a combination of short-term promissory notes ("Commercial Paper Notes"), and extendible-term promissory notes ("Extendible Notes", together with the Commercial Paper Notes, "Notes"), to institutional investors. The Prefunded Liquidity Program supplements NSCC's existing liquidity resources each business day and allows it to dynamically adjust its liquidity resources as exposure changes.

In February 2020, NSCC received approval to raise additional prefunded liquidity through the periodic issuance and private placement of term debt to qualified institutional investors. The term debt mitigates risks to NSCC that it is unable to secure default liquidity resources in an amount necessary to meet its liquidity needs. For example, this debt helps mitigate the risks that investor demand for the short-term notes issued under the Commercial Paper Program weakens, or that NSCC is unable to renew its credit facility at the targeted amount.

NSCC has established a default liquidity program that is not reliant on a single liquidity resource, can adjust to changes in exposure, accesses both credit and funding markets, and incorporates a member liquidity obligation when exposures exceed available resources.

7.1.4 CONCLUSION

NSCC's liquidity risk management has evolved in order to adhere to regulatory requirements including to maintain sufficient liquidity to complete end-of-day settlement in the event of the default of a member. As part of its efforts to maintain compliance with these requirements, NSCC has continued to strengthen its liquidity risk management strategy, including proactive client engagement and through growing and diversifying its qualifying liquid resources.

7.2 CASE STUDY: MULTI CCP DEFAULT EXERCISE (EUREX'S AND SGX'S PERSPECTIVE)

ABSTRACT

Each CCP has appropriate policies and procedures in place to handle the default of one or more of its CMs. According to CPMI-IOSCO PFMI Principle 13 “[t]he periodic testing and review of default procedures is important to help the FMI and its participants to fully understand the procedures and to identify any lack of clarity in, or discretion allowed by, the rules and procedures...” Default management exercises are regularly performed on at least an annual basis, to ensure readiness of the default management practices of the CCP.

Given the interconnectedness of the financial markets, a failure of a large common CM across multiple CCPs could have a significant impact on the financial system. In October 2020, an authority led default exercise was conducted in parallel across multiple CCPs, simulating a default of a large hypothetical common CM. The exercise was the fourth of its kind, comprising the largest number of participating CCPs and regulatory authorities to date. Both Eurex and Singapore Exchange (SGX), among other CCPs, participated in the default exercise. The multi-CCP default exercise achieved its objectives and its observations are used to refine and improve the CCPs’ existing default management procedures.

7.2.1 BACKGROUND

Eurex Clearing provides CCP services for the derivatives markets of Eurex Exchange (listed derivatives) as well as EurexOTC Clear (over the counter, OTC interest rate derivatives), for the cash market Frankfurt Stock Exchange (equities, bonds, Exchange Traded Funds (“ETFs”), and other Exchange Traded Product (“ETPs”)), and for securities financing transactions conducted via the multilateral trading systems of Eurex Repo GmbH.

SGX-DC is a CCP within SGX Group, providing clearing services for a wide range of derivatives products including swaps, futures and options on equity indices, dividend indices, interest rates, commodities, and foreign exchange.

There were three main objectives covered during the default exercise, addressed by the regulators which included:

1. To identify issues that could arise during the CCP’s hedging and auctioning processes when CMs respond to hedge and auction requests from multiple CCPs, in a compressed timeframe.
2. To identify issues that could arise during the liquidation of collateral of the CCP’s defaulted CM as part of its default management procedures, including the assessment of the CCP’s ability to do so.
3. To collect observations and feedback from participating CMs, including strengths and weaknesses of managing a default, identifying areas for improvements, especially during the COVID-19 pandemic period under remote working arrangements.

This case study provides an overview of how both CCPs (Eurex and SGX) conducted their default management exercise during the multi-CCP drill.

7.2.2 DEFAULT SCENARIO:

A large hypothetical common CM ranked among the top five members by exposures for each CCP has experienced issues in meeting its margin requirements.

The market moves replicated those of March 2020 COVID-19 meltdown, the most rapid sell-off in market history were used.

7.2.3 SIMULATION PORTFOLIOS:

For Eurex Clearing, the simulated portfolios were representative of a top 5 CMs according to position number, margin requirement, out-right market risk (with focus on equity). The equity book included futures and options on single stock and indices, total return futures, volatility, and dividend derivatives. Some less traded products were also in scope to create transparency and increase member obligation’s awareness. The portfolio was highly affected by the simulated market scenario.

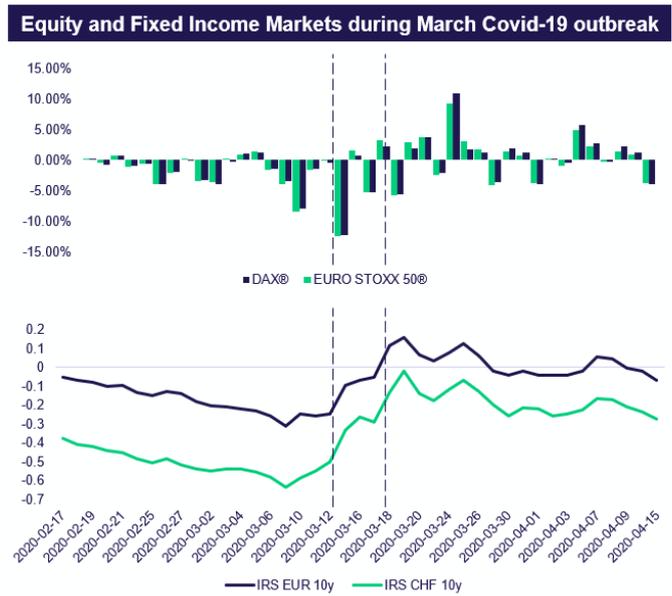
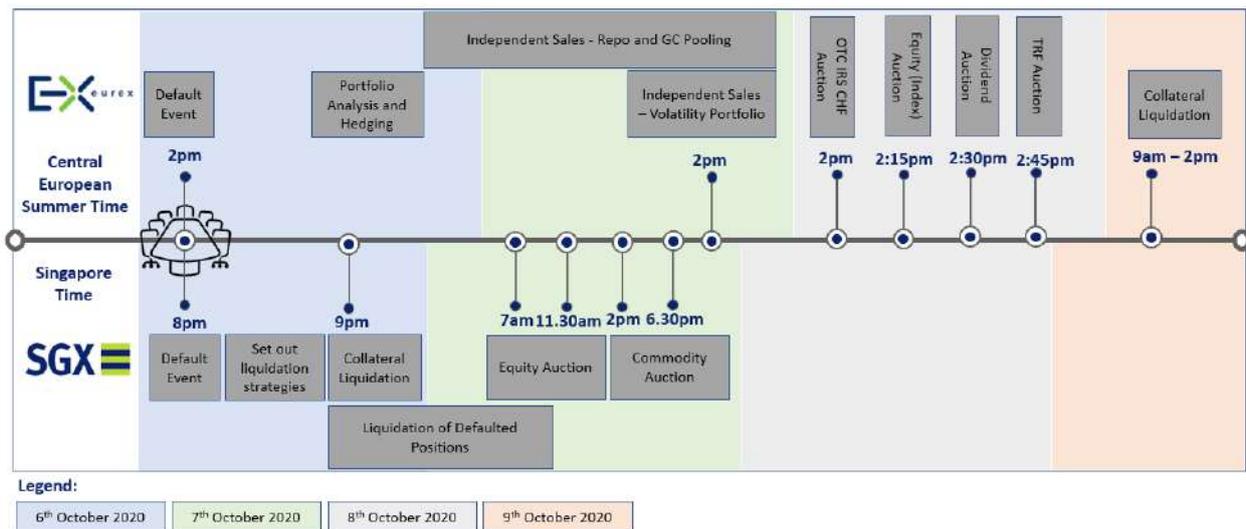


Figure 7-1

For SGX, the simulated portfolio comprised of key derivatives contracts, including positions with non-linear risks. Likewise, to increase members’ awareness, some less traded contracts were included. SGX also included the liquidation of the simulated defaulted member’s non-cash collateral as part of the exercise.

The following timeline summarizes the key activities which took place at Eurex and SGX.



7.2.4 THE EXERCISE BEGINS...

The exercise began on Tuesday 6th October, 2020 (2 p.m. CEST, 8 p.m. SGT), where a default was triggered simultaneously at all CCPs involved. The exercise began with a default of a large hypothetical common CM with primary focus on a proprietary portfolio.

At 2pm CEST, Eurex activated its Eurex Clearing Default Management Emergency Committee, consisting of a group of clearing, trading, compliance, and legal specialists that provides guidance to the Executive Board (“ExBo”) in matters related to a CM’s termination. The trigger event was an unfulfilled intraday margin call derived from the extreme simulated market scenario. The ExBo decided to terminate the member at 2:30pm

CEST and instructed the Default Management Team to initiate the DMP (Clearing Conditions: [Chapter I Part 1 paragraph 7 Termination Rules with Respect to the Clearing Member](#)).

At the same time (8pm SGT), during night hours in Singapore, SGX activated its pre-established default recovery team for SGX-DC. The default recovery team is comprised of staff from Risk Management, Member Supervision, Market Operations, as well as other supporting units such as Legal and Communications. When a CM is assessed by the default recovery team to be at risk of not meeting its obligations to SGX-DC, the SGX's default recovery team alerts its senior management and, as necessary, activates the SGX's crisis management team. SGX's crisis management team is comprised of members of the SGX Executive Management Committee (EMCO), the Head of Business Continuity Management and senior management staff. The assessment was made that the hypothetical CM was unable to meet its obligations to SGX-DC, and an event of default was declared. SGX-DC proceeded with its default management activities thereafter (refer to [SGX-DC Clearing Rules 7A on Suspension and Default](#)).

Each CCP maintains defined policies and procedures for managing an event of default of a CM, in adherence to the CPMI-IOSCO PFMI Principle 13. Considering the unique circumstances of each default and the different product offerings, regulatory environments and jurisdictions, it is imperative that a CCP retains the necessary flexibility in their default management approach.

7.2.5 FIRST LINE OF DEFENCE

As the first line of defence, the member's collateral placed with the CCP, such as margin requirements, aim to protect the CCP against potential losses arising during the liquidation of its portfolio in the event of a default of the member. The collateral portfolio used in the exercise was comprised of a concentration of currencies and securities that are typical of a CM's portfolio.

SGX-DC only accepts high quality collateral with low credit, liquidity, and market risks. For government securities, only Singapore government securities, Monetary Authority of Singapore ("MAS") Bills, and bonds issued by countries with strong credit ratings and ample market liquidity such as U.S., Japan, Germany, and France are accepted. An overview on the eligible collateral accepted by SGX is provided on the [website](#). In an event of default, the government securities of the defaulted member will be liquidated and converted into cash.

Eurex Clearing accepts approximately 10,000 securities that are also admissible as collateral for the European Central Bank or the Swiss National Bank. On top of it, almost 850 government bonds from non-EU countries (AU, CA, JP, U.S.) and selected equities are eligible as collateral. An overview on the eligible collateral accepted by Eurex Clearing is provided on the website under the following [Link](#). Differently from SGX, Eurex Clearing liquidates the securities collateral in the post liquidation phase of the DMP.

7.2.6 EUREX CLEARING PORTFOLIO ANALYSIS AND HEDGING

Eurex Clearing relies on experienced internal traders for portfolio analysis and hedging. Default Management Committees formed by seconded market participants are installed for the main Liquidation Groups. These panels of seconded traders from selected CMs advise Eurex Clearing in determining the hedging strategies and support in the subsequent liquidation of the respective positions.

Hedging is the most critical part of the DMP, whereby most of the risk gets transferred from the CCP to the market. All subsequent DMP actions depend on its successful execution. Successful hedging "*stops the bleeding*" by stabilizing the CCP's exposure to market moves.

Eurex Clearing's tools allow for an accurate and detailed risk analysis of complex portfolios.

The results of this analysis are usually compared with the analysis performed by each Member of the Default Management Committee using their banks internal risk tools. Matching portfolio analysis verified the quality of Eurex Clearing's tools. Hedging Strategies were approved by Executive Board and executed.

Four Members were requested to provide a quote for the hedging positions considering distressed market conditions. The simulated hedge reduced the portfolio risk significantly, initial margin requirement shrank by 85%.

7.2.7 RETURNING TO A MATCHED BOOK

It is important for the CCP to have a default management toolkit with the flexibility to deploy appropriate actions to liquidate different types of products during an event of default to achieve the most optimal outcome of the default management process. This is so as the product offerings, market structures, regulatory, and legal environment(s) of each CCP is different.

Appropriate default and recovery tools can be adopted to enable a CCP to restore a matched book quickly and efficiently, so that the default losses can be minimized. CCPs have various powers under their clearing rules to employ various default and recovery tools. SGX-DC has a Default Advisory working group comprised of CM representatives who are called upon to agree on liquidation strategies and auction procedures, on an ex-ante basis, including but not limited to, hedging and splitting of the auction portfolio.

SGX's default recovery team sets out its liquidation strategies of the assumed defaulted positions and sought the approval from its crisis management team. Once approved by the SGX's crisis management team, SGX proceeded with the liquidation of non-cash collateral, as well as defaulted positions through its appointed execution broker(s).

In the case of Eurex, Independent Sales are the preferred option to liquidate small or specific portfolios. CMs and/or Disclosed Clients are invited to participate on a voluntary basis. An Independent Sale is executed instead of an auction only if the respective losses would not exceed the defaulting CM's margin collateral and Default Fund contribution.

Another default management tool adopted by both Eurex and SGX is the default management auction. In some cases, a default management auction is the fastest approach to liquidate inherited portfolios and restore a CCP's matched book.

In the case of SGX, where a defaulted portfolio has non-linear risks or enjoy cross-product margin offsets and strong portfolio effects, the positions may be more expeditiously disposed of as an auction portfolio(s). SGX-DC's auction mechanism is limited to and mandatory for, non-defaulting CMs who have open cleared positions in the contracts that constitute the auction portfolio at the time of the relevant event of default. Each auction portfolio includes only contracts of the same underlying. Currently, SGX runs Single-Unit auctions where participants provide a single bid for the auction portfolio. While participation in the auction is limited to non-defaulting CMs, the SGX-DC CM may involve its client in pricing the auction portfolio. Prior to disclosure of any information relating to the auction, the CM must have executed an SGX-DC prescribed non-disclosure agreement with the customer. While the SGX-DC CM remains solely liable for any auction bid submitted, such indirect client involvement is necessary to increase the success rate of an auction. SGX recognised that some of its CMs only operate a client clearing business, and it is their clients who are better positioned to price the auction portfolio. At the same time, a client could be willing to take on the auction portfolio at a more competitive price.

In the case of Eurex, CMs are requested to participate on a mandatory basis based on their activity in the relevant Liquidation Group.

With respect to Eurex Clearing, there are two types of auction formats:

- Single-Unit: participants provide a single bid for the full portfolio – typically used for OTC IRS.
- Multi-Unit: participants provide a two-way bid for some units of the full portfolio. This tool is also a very efficient method to spread risk across different market participants for ETD.

Non-mandatory CMs are welcome to participate in auctions on a voluntary basis, while clients can fulfil their CMs bidding obligation if proper agreements are in place.

For SGX, its operational procedures on the liquidation of the government securities were tested, which is swiftly executed through its approved dealer. The simulated default member’s collateral identified to be liquidated included U.S. government securities and Japanese Government Bonds. Instructions were sent out on the night of 6 October 2020, and the approved dealer responded within an hour and provided quotes at fair value, after close of Asian market hours.

Concurrently, SGX-DC engaged its appointed execution brokers to assist SGX-DC to execute market transactions (opposite leg of the assumed defaulted positions), as some of the assumed defaulted contracts are still actively traded during Asian night hours. Once such market transactions are executed, the trades give up to SGX-DC in order to close out the defaulted positions. The liquidation process continued the next morning for SGX, where further instructions were given to its appointed execution brokers to execute the remaining assumed defaulted contracts during its active trading hours.

For this exercise, SGX-DC selected one of its key equity contracts, as well as one of its commodity contracts to run through the auction process. This is to build awareness and understanding of the unique nature of each contract. The auction took into consideration the prevailing market liquidity condition, as well as the trading hours where the contract is most actively traded. The auction for the SGX-DC’s key equity contract was conducted in the morning of 7th October 2020, and the auction for the commodity contract was conducted in the afternoon on the same day.

For Eurex Clearing, the assumed defaulted Equity portfolio during the fire drill was split in 4 subgroups (Standard, Dividend, Volatility and Total Return Futures) that were successfully liquidated separately. The Volatility book was liquidated first via Independent Sale on Wednesday 7th, where four CMs voluntarily participated, providing quotes in live and distressed market conditions. It was noted that the average distressed liquidation costs were roughly four times higher compared to live market.

On 8th October 2020, Eurex Clearing liquidated the remaining three books during separate subsequent auctions. In addition to mandatory participants, five CMs/Clients participated on a voluntary basis.

Product Group Scope	Equity Derivatives			
	Equity (Index)	Volatility	Dividend	TRF
Auction / IS	08 Oct 20 (A)	07 Oct 20 (IS)	08 Oct 20 (A)	08 Oct 20 (A)
Mandatory Participants	21	N/A	13	11
Voluntary Participants	5	4	5	5
# of Good bid quality	30	N/A	20	20
# of Mediocre/Late	0		2	0
# of Bad/Rejected/Not quoted	2		0	0

In multi-unit auctions invited participants can provide more than one bid, hence # of bids might be greater than # of participants

Figure 7-2

In total 21, 13, and 11 CMs were mandated to participate in the Standard, Dividend, and TRF auctions respectively. Participation Rate is a Key Risk Indicator for Eurex Clearing. An auction is considered successful when this rate is greater than 75%. This indicator was met as participation rates for all auctions ranged from 85% to 100%.

7.2.8 AUCTION TOOLS

Both Eurex and SGX offer auction platforms to their auction participants, which provide flexibility and allow for access remotely from any location and time zone.

For Eurex, all default management auctions are held on the Eurex Clearing Auction Tool. The web-based interface provides a stable and reliable execution of the operations needed for a successful auction completion.

Similarly, for SGX, its web-based interface auction platform provides a centralized access point for the CCP to interact with its CMs. SGX CMs can also refresh their bids at any time up until the close of the auction. Both Eurex's and SGX's auction tools were described as straightforward, user-friendly, and intuitive by the auction participants.

The auction platforms enabled CCPs to run an auction efficiently and effectively. Among other features, these auction platforms allow CCPs to monitor incoming bids in real-time and participants to:

1. Autonomously manage their users involved in the auction process.
2. Download portfolio information.
3. Provide bids during the auction's bidding window.
4. Receive communications via news boards.

7.2.9 INCENTIVES

The success of a CCP auction is supported by the incentive framework surrounding it. The robustness of the auction process may be enhanced by shaping the behaviour of the participants. One of the common incentives that is adopted by CCPs includes juniorisation or seniorization of its CMs' default fund contributions (i.e., good bids are seniorized, while bad bids are juniorized). Such practice is adopted by both Eurex and SGX.

Eurex applies a set of incentives including default fund juniorisation and monetary penalties for mandated CMs who fail to provide a sufficient bid in a DM auction.

SGX also applies a juniorisation mechanism through acceleration of the use of such non-defaulting CMs' default fund contributions. Default fund contributions of non-bidders are applied first, followed by those of other bidders, and winning bidders sit within the last tranche.

The success of default management auction hinges on the incentives surrounding the auction mechanism. Such incentives shape the behaviour of auction participants, which enhances the robustness of the auction mechanism adopted by the CCPs. Both Eurex and SGX auctions apply a juniorization mechanism, where good auction bids are rewarded or seniorized, while less competitive bids are juniorized. These frameworks are clearly defined for CCP's CMs and agreed on an ex-ante basis.

7.2.10 POST LIQUIDATION

Once all the inherited positions are liquidated Eurex Clearing nets, in accordance with Germany's insolvency law, all outstanding claims between itself and the CM, determining the so-called Difference Claim. This represents a single monetary claim owed by one party to the other. If the Difference Claim is in favor of the CCP, the available resources, in accordance with the [Default Waterfall](#), are used to offset this claim. During the simulation Eurex Clearing quantified the amount of the Difference Claim. This claim, in favor of the CCP, was offset by the liquidation of parts of the defaulter's pledged margin collateral.

Likewise, in accordance with the Securities and Futures Act, Chapter 289, a net sum will be determined by SGX-DC, upon the completion of its default proceeding, to be payable by or to the defaulted CM. SGX-DC has rights under its Clearing Rules to apply relevant defaulted CM's collateral to discharge its obligations. The default loss was offset against the hypothetical common CM's pledged collateral.

7.2.11 KEY OBSERVATIONS FROM THE EXERCISE

In general, following Eurex Clearing's and SGX's exercise, CMs provided positive feedback and shared observations. CMs pointed out that the exercise was very useful to test their operational readiness, as the exercise increased their familiarity with the default procedures of the CCPs.

Both Eurex Clearing and SGX actively sought-after participants' feedback, 13 and 9 bilateral sessions were conducted respectively. In general, CMs confirmed that the communication was well articulated and the procedures explained in a detailed manner. Both Eurex and SGX encouraged its CMs to take the default management exercise seriously and participate in the same manner as they would in case of an actual default. Stakeholders understood the procedures and were prepared to support the CCP.

Some CMs highlighted that they were facing constraints as they were forced to prioritize their resources during their participation in the auction(s) of CCP(s). The CMs' market risk procedures also require their business units to take immediate steps to reduce their exposures unless a temporary limit approval is granted. At Eurex, the portfolios won at auction were in line with the size CMs can trade and would have had no significant impact on members' risk limits as they were perceived to be well delta hedged. With multiple CCPs conducting auctions concurrently, CMs could have limited appetite to take on multiple auction portfolios as it could lead to potential breach of their risk and regulatory capital thresholds. To the extent possible, such auction portfolio(s) will be risk-reduced.

Given the size of the hypothetical portfolio, CMs also provided feedback that breaking down the portfolio into more sub-portfolios might allow more participants to provide better auction bids. CMs expressed that multi-unit auctions could maximise auction participation and provide an optimal combination of auction bid(s). SGX will be expanding its auction format to include multi-unit auction, where appropriate.

In addition, CMs' bids may have been affected by the time constraints placed by the CCPs. Notably, this challenge was amplified by the hypothetical default of a large CM in the exercise, where the non-defaulting CMs were required to respond to hedge and auction request(s) from multiple CCPs in a compressed timeline. SGX-DC's practice of allowing CMs to resubmit their bids prior to the auction bidding time was welcomed by the participants.

Both Eurex and SGX were able to restore to a matched book. Eurex's rebalancing of the CCP was achieved well within each Liquidation Group Margin Period of Risk. The successful liquidation confirms the correct allocation of products within their Liquidation Groups. Similarly, SGX's default management procedures were managed within the respective contract's MPOR. Despite the distressed scenario, both CCP's Skin in the Game and mutualized contributions of non-defaulted members remained untouched, validating the appropriateness of margin parameters.

One of the main lessons learned from the simulation was related to the need of quote standardization and improved execution of hedging transactions. This led to the design and implementation of Eurex's Mandatory Hedging Auctions, a new instrument which was added to the Default Management toolbox that ensures Eurex Clearing's access to broader Liquidity Pools.

Despite the disruption brought by the COVID-19 pandemic, SGX has adapted to circumstances by operationalizing its default management processes remotely and in multiple locations. SGX also noted the default management exercise has enabled CMs to build up their internal procedures, including training of their

in-house traders, where applicable, which improves their readiness to fulfil their obligations as CMs. In some case, CMs also took the opportunity to build their own toolkit for managing the default of their direct clients.

In summary, the multi-CCP default exercise conducted by Eurex and SGX identified areas for improvement based on CMs' response to hedge and auction requests from multiple CCPs in a compressed timeframe. This confirms the usefulness of executing such coordinated exercises. Observations from the exercise are used to refine and improve these CCPs' existing default management procedures.

7.2.12 THE WAY FORWARD

CCP12, EACH, FIA, and ISDA published a [CCP Default Auctions Best Practices](#) in February 2021. There has been increased consistency among the industry in terms of terminology and operational issues pertaining to auctions. The paper focuses on the standardization of auction terminology, including defining different types of auction formats, as well as standardization of certain operational aspects of auction procedures.

The CCP12 Office is looking to coordinate the schedule of future joint default management exercise. As a coordinator of the future joint default management exercise, CCP12 Office could assist in drafting lesson learned including potential feedback to regulators.

8. COMMODITIES MARKETS IN 2021

8.1 CASE STUDY: RISK MANAGEMENT MEASURES AGAINST HIGHLY VOLATILE COMMODITY MARKETS (JSCC'S PERSPECTIVE)

ABSTRACT

The case study of JSCC reviews its risk management for listed commodity derivatives. It shows how JSCC managed large price movements in Japan's commodities markets, especially in the electricity market in 2021 where the volatile price moves were observed.

JSCC, a subsidiary of Japan Exchange Group, provides clearing services for listed equities traded at exchanges and Proprietary Trading Systems ("PTs") in Japan, which include listed financial derivatives, listed commodity derivatives, credit default swaps, interest rate swaps, and Japanese government bonds. JSCC's clearing services also include delivery, payment, and receipt of ETFs, as well as the component stocks and cash associated with ETF Creation/Redemption.

This case study reviews JSCC's risk management for listed commodity derivatives, such as energy, which has recently attracted more attention due to rising concerns on growing geopolitical and climate change risks.

Currently, JSCC clears the following listed commodity derivatives:

Product Category		Exchange
Precious Metals	Gold	Osaka Exchange (OSE)
	Silver	
	Platinum	
	Palladium	
Rubber	Rubber(RSS)	
	Rubber(TSR)	
Agricultural Products	Soybeans	
	Azuki(Red Bean)	
	Corn	
Petroleum etc.	CME Group Petroleum Index	
Energy	Oil	Tokyo Commodity Exchange (TOCOM)
	Electricity	
	LNG(2022.4-)	
Chukyo Oil	Chukyo Oil	
Agricultural / Sugar	Rice	Osaka Dojima Exchange (ODEX)
	Corn	
	US Soybeans	
	Azuki(Red Bean)	
	Raw Sugar	

Figure 8-1: JSCC Cleared Listed Commodity Derivatives

JSCC began clearing services for listed commodity derivatives after merging with Japan Commodity Clearing House ("JCCH") and taking over its clearing business in July 2020. Initially, the risk management for the listed commodity derivatives followed the existing practices of JSCC's listed financial derivatives. The initial margin requirements were shown to be sufficient by the back testing results in figure 8-2, and the credit stress testing results highlight the robustness of JSCC's risk management.

Precious Metals	Rubber	Agricultural Products	Energy
99.88%	99.69%	100.00%	100.00%

Figure 8-2: JSCC Margin Backtest (EoY 2021)

In 2021, large price movements in commodities markets, especially energy markets, were globally observed and Japan was not an exception to this volatility. Since the full liberalization of Japan’s electricity market in April 2016, the trading volumes of the Japan Electric Power Exchange (“JEPX”) have greatly increased and now accounts for the equivalent of approximately one third of Japan’s electricity consumption. The electricity price in JEPX surged in early 2021, due to high demand and concern of supply shortage, as shown in the below figure.

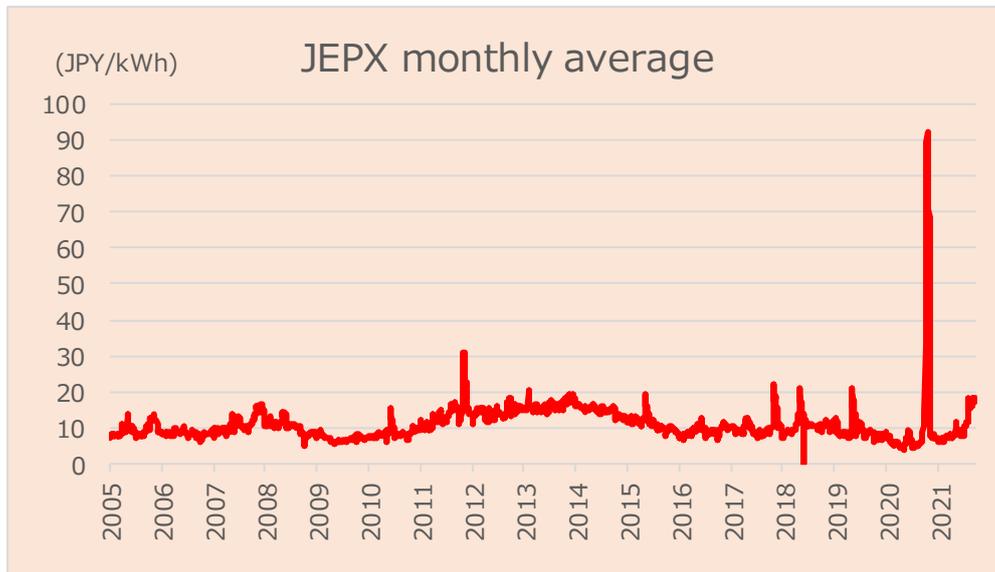


Figure 8-3: JEPX Tokyo base load monthly average

Tokyo Commodity Exchange (“TOCOM”) lists four electricity futures with consecutive 24 months expiry (before April 4, 2022, consecutive 15 months expiry), as a risk hedging tool for the electricity price. These four electricity futures contracts are the East Area Baseload Electricity (“TEBL”), West Area Baseload Electricity (“TWBL”), East Area Peakload Electricity (“TEPL”), and West Area Peakload Electricity (“TWPL”), for which JSCC provides clearing services.

JEPX and TOCOM

JEPX is the only exchange which operates an electric power exchange in Japan. In April 2005, it launched an electric power spot market and a forward market, and the number of its trading members has reached approximately 280, including major electricity power companies, independent power producers, and other companies. In September 2019, TOCOM listed futures whose underlying asset is an electric power spot trade in JEPX. Currently, the number of trading members is about half of JEPX's members and, as for the supply and demand of electricity futures, major buyers tend to be domestic power companies while major sellers tending to be domestic power companies and foreign electricity futures traders. Currently, retail investors are not allowed to trade electricity futures.

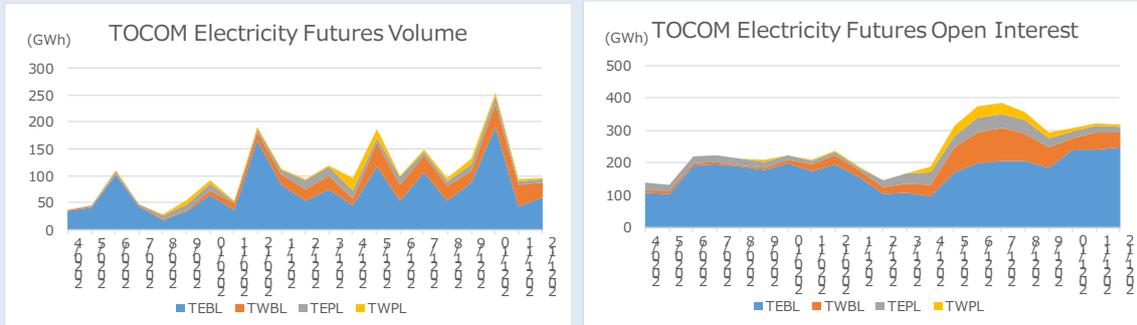


Figure 8-4: TOCOM Electricity futures volume & open interest

As electricity futures prices are influenced by fuel prices, as well as supply and demand, large price movements are often experienced near expiry contracts, especially in summer demand contracts (July to September) and winter demand contracts (December to February). Meanwhile, the prices of non-near expiry contracts can dramatically change depending on the market expectations of future demand.

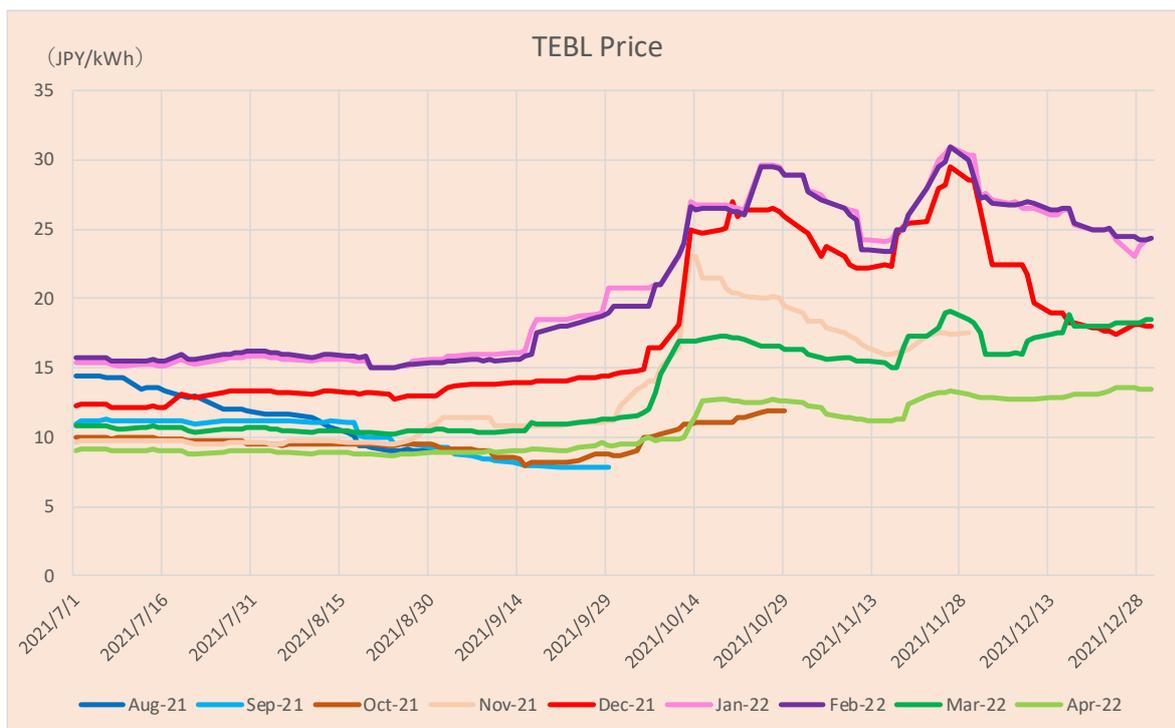


Figure 8-5: TOCOM Electricity futures (TEBL) price

To address the characteristics of these price movements for electricity futures, JSCC configures the tier parameters for the calculation of initial margin for each expiry month. In addition, it separately creates “extreme but plausible” stress scenarios for the default funds, mutual guarantee resources for nearest expiry

month in winter demand contracts, nearest expiry month in summer demand contracts, second and third nearest expiry months in winter demand contracts, second and third nearest expiry months in summer demand contracts, 3 nearest expiry months in lower demand season contracts, and fourth or further expiry months contracts.

Moreover, JSCC's initial margin parameters are derived from the expected shortfall of large price movements data, which includes the past largest and second largest price movements, to prevent margin procyclicality. This prevention mechanism has also been adapted for petroleum, Dubai crude oil, and liquefied natural gas ("LNG") futures.

From late February 2022, despite rising geopolitical risks in almost all markets globally, JSCC has continued to observe the effectiveness of its risk management, which addresses the specific characteristics of electricity futures. JSCC will continue to operate its risk management considering the market situations and reflect them when necessary.

9. ACCOUNT MODELS AT CCPs

9.1 CASE STUDY: REGTECH SOLUTIONS AS PUBLIC GOODS: CUSTOMER COLLATERAL PROTECTION IN INDIA (NSE'S PERSPECTIVE)

ABSTRACT

The relative degree of safety offered by different account structures at CCPs is clearly understood. It is widely accepted that individual segregation of positions and collateral provides a high degree of safety to the customers. However, under traditional technological capabilities, individual segregation had operational and other challenges and was therefore costly. This case study discusses how modern technology was leveraged by CCPs in India to offer universal individual segregation to all classes of investors. The solution achieves transparency, superior protection from both participant and fellow customer default, and improves the likelihood of portability.

9.1.1 INTRODUCTION

Customers primarily rely on the oversight of regulators and/or market infrastructure institutions to ensure appropriate business conduct by market intermediaries. Traditionally, in India, such oversight is low frequency, detective rather than preventive, and limited due to practical considerations. Its NSE Clearing's view that increasing capital requirements and compliance costs create entry barriers which have the negative externalities of hindering financial inclusion, competition, innovation, and growth and development of markets. Besides, we believe entry barriers are not a failsafe preventive mechanism and can result in two types of errors: denying entry to good intermediaries and failing to prevent the entry of bad intermediaries.

However, with increased technological capabilities, it is now possible to create Regulatory Technology ("RegTech") solutions that resemble the features of non-excludable and non-rivalrous public goods. These solutions can support real-time monitoring and abuse prevention (rather than delayed detection), even for a very large number of customers. Such technology driven RegTech solutions can improve protection for all investors, lower the barriers to entry for intermediaries, achieve effective oversight, and reduce supervision and enforcement costs.

We discuss the example of customer collateral segregation framework in India, where about 50 million customer collateral accounts are maintained by NSE Clearing – individually segregating and protecting the securities and cash collateral of all customers from participant as well as fellow customer default. In addition, information is disseminated to all customers directly to provide for complete traceability of their collateral. As a result of this framework, in the event of a default at NSE Clearing, it is far more likely that customers will be able to port their positions and collateral or obtain an immediate return of the collateral directly from the CCP. Modern technology enables all this to happen in an environment with upfront identified collateral and a real-time margining system.

In India, customers traditionally place collateral with participants through a fiduciary transfer of ownership, where the title of collateral is transferred only to secure a contingent future claim. However, the customers face an agency problem: information asymmetry regarding further deployment of collateral, and moral hazard of misuse of collateral by the participant. The RegTech solution implemented in India solves these issues by providing collateral traceability to the customers directly from the CCP and restricting the ability of participants to misuse the collateral.

The rest of this article is organized as follows: the second section describes the framework prevalent before the recent collateral reforms and associated challenges, and the third section discusses in detail the phase-wise implementation of the tech-enabled collateral reforms.

9.1.2 EARLIER FRAMEWORK AND CHALLENGES

In India, a unique ID is required to be allocated to every customer, which needs to be specified while trading. Thus, not only the participants, but also the ultimate customers are identified for every trade. Consequently, the positions are maintained at customer level (netting of trades within the customer but no netting across customers), and portfolio margins are calculated separately for each customer.

However, until the recent reforms, the collateral received from the participants remained comingled at the CCPs. The major forms of collateral that NSE Clearing accepts include securities, cash, and lien-marked bank deposits. The prevailing practice of providing collateral was as follows:

Type of collateral	Customer to Participant	Participant to CCP
Cash	Title transfer to participant	Title transfer to CCP
		Lien-marked bank deposits
Securities	Title transfer to participant	Pledged through CSDs

Figure 9-1

The framework suffered from the following drawbacks:

1. **Risk in case of margin shortfall:** In the event of a default of a participant, the CCP would appropriate collateral towards losses. The customers could register their claims during the default procedures and remaining collateral, if any, could be returned to customers having valid claims. The customers faced fellow customer risk (as well as from proprietary/house account). This is because in case of any losses in any account, all available collateral would have been used, and non-defaulting customers' claims on collateral could only be considered after the fulfilment of the CCP's claim.
2. **Risk of fraud:** There was a risk of fraudulent use of excess collateral of a customer by their participants for purposes other than fulfilment of margin requirements at the CCP.

9.1.3 CUSTOMER COLLATERAL SEGREGATION FRAMEWORK

The customer collateral segregation framework in India has the aims of:

1. Providing transparency and traceability of collateral to the customers and CCP;
2. Providing individual collateral segregation and protection for all customers; and
3. Making portability and quick return of collateral highly likely.

The regulations were implemented in three phases: (i) margin pledge/re-pledge mechanism for securities collateral, (ii) reporting and disclosure of cash collateral on T+1 basis and (iii) upfront allocation of customer cash collateral till end customer.

9.1.3.1 PHASE-1: MARGIN PLEDGE/RE-PLEDGE MECHANISM FOR SECURITIES COLLATERAL

In the first phase a pledge/re-pledge facility was introduced in August 2020 by CCPs along with CSDs.

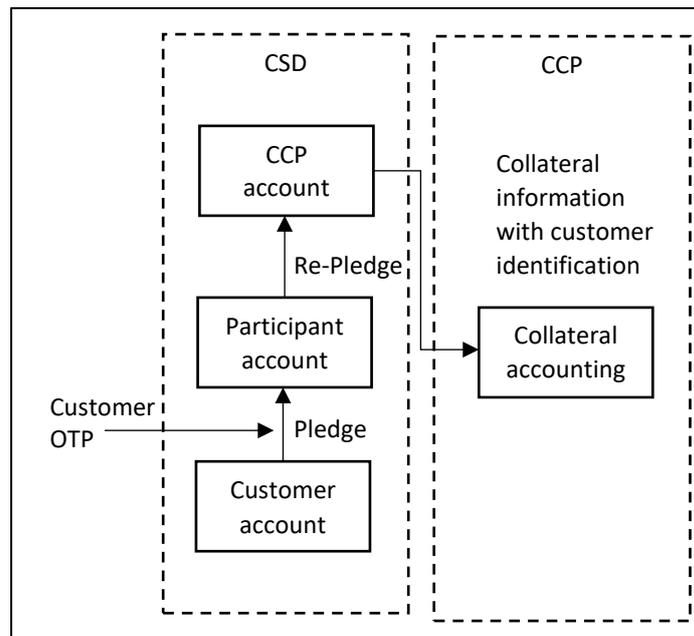


Figure 9-2: Margin Pledge/Re-pledge mechanism

In India, the following process is followed for acceptance and monitoring of the customer collateral:

1. Depositories in India maintain beneficiary accounts at a customer level, however, before the reforms customers were required to title transfer securities to participant accounts.
2. The practice of title transfer was halted, and securities now remain in the customer account, and participants may request to create a pledge in favor of the participant account. The CSDs effect the pledge after confirming it with the customer using a one-time-password (“OTP”).
3. Such securities can be further re-pledged by participants to the CCP using the re-pledge facility provided by CSDs. CSDs provide the details to the CCP along with a full trail up to the end customer level. This is enabled by linking the CSD account numbers with the customer codes recognized by CCP.
4. Thus, the identity of the end customer who is the beneficial owner of securities is known to the CCP. The CCP ensures that such securities are only considered eligible towards the margin requirement of the respective customer.
5. Any release or invocation of pledged securities can be done first by the CCP, and then by the participant, in that order. In case of default, the CCPs shall not use securities of non-defaulting customers, protecting them from utilization. The securities are pledged only after customer consent and remain in the customer account, protecting them against fraud or misuse.

9.1.3.2 PHASE-2: REPORTING AND DISCLOSURE OF CASH COLLATERAL TO CUSTOMERS

After the protection of the securities collateral in the first phase, the second and third phases of the reforms in India aimed at protection of cash collateral. Under the second phase of the reforms, the participants were required to disclose, customer-wise and on a daily basis, the amount of collateral received by participants from customers, the amount of collateral retained with the participants, and the amount of collateral provided to the CCP. The second phase was implemented in October 2021.

The collateral is thus maintained in a manner that is in some ways similar to the Legally-Segregated-Operationally-Comingled (“LSOC”) mechanism. The CCP maintains the cash collateral at the level of the participant, the customer-wise breakup of the value of cash collateral. This is done at a very large scale of about 50 million customers. Thus, the CCP can detect any use of one customer’s collateral towards another customer’s margin requirements early.

Since the customer identification (including contact details) are required to be provided at the time of customer registration, a CCP is able to share the information provided by participants directly to the respective customers.

NSE Clearing developed a web portal where end customers could log in and view the collateral information provided by the participants to the CCP. This achieves two purposes: firstly, the fraud risk is mitigated since the customers can raise alerts in case of misreporting by participants; and secondly, it provides the clarity to the customers on the amount of collateral protected under the CCP framework (the amount passed on to CCP), and the amount for which recourse lies outside the CCP framework (amount retained by participant).

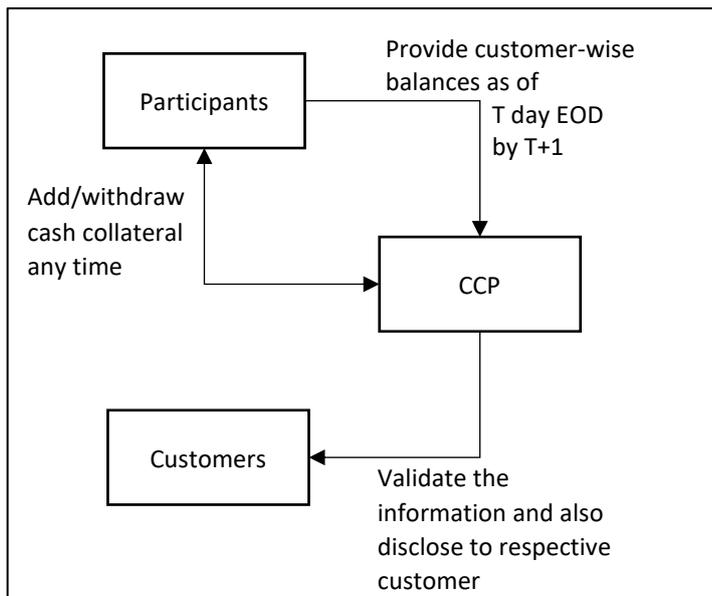


Figure 9-3: Phase 2 – Collateral Reporting by T+1

The following process is followed:

1. Participants can add/withdraw collateral at any time. No customer-wise identification is required at the time of deposit/withdrawal of collateral.
2. The information pertaining to T-day customer-wise end-of-day balances of cash collateral need to be submitted to the CCP by T+1.
3. The CCP validates the information and also makes it available for customers to view. Customers can raise grievances in case of any misreporting by members.

9.1.3.3 PHASE-3: ALLOCATION OF CASH COLLATERAL TO CUSTOMERS

The third phase of the reforms in India will further strengthen the segregation framework. Under the second phase, the CCP cannot always prevent utilization of collateral of a customer towards another’s margin requirement as the customer-wise collateral details are provided with a one-day lag. Under the third phase, the participants must provide customer-wise allocation of collateral at the time of deposit and must also specify the customers whose collateral is being withdrawn, at the time of withdrawal. Any change in allocation is communicated instantly to the customer.

CCPs in India require margins to be provided on upfront basis and the margin calculations are done on a real-time basis. With the customer-wise breakup of collateral available upfront, the CCPs can ensure that the collateral belonging to any customer is used towards the margin requirements of the respective customer. Proprietary/house collateral can be utilized in case of shortfall in a customer account, but customer collateral can only be utilized towards the obligations on account of the respective customer.

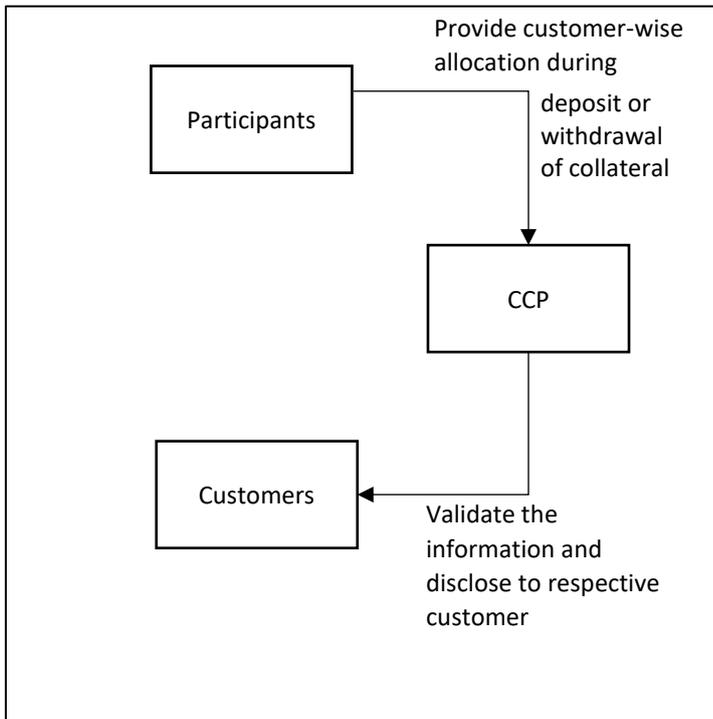


Figure 9-4: Phase 3 – Upfront collateral allocation

A summary of the process in India is placed below:

1. The participants must allocate collateral customer-wise (or as house/proprietary collateral) whenever depositing the collateral.
2. The participants can change the allocation from one customer to another, provided collateral is not utilized towards margin.
3. CCPs calculate real-time margins at customer level. A customer collateral is utilized towards the margin requirement of the respective customer only.
4. In case of default of participant, the CCP protects the collateral allocated to the customer. The CCP provides the allocation information to the customers instantly.

10. DEVELOPMENTS IN DERIVATIVES LAW

10.1 CASE STUDY: CHINA MARKS A MILESTONE IN THE LEGALIZATION OF THE FUTURES AND DERIVATIVES MARKETS (SHCH'S PERSPECTIVE)

ABSTRACT

In April 2022, the National People's Congress of China approved the final version of the Futures and Derivatives Law. The new law will take effect on August 1, 2022.

The Futures and Derivatives Law expressly recognizes the legal enforceability of close-out netting for futures and derivatives markets in China, including OTC derivatives transactions cleared through CCPs. It also provides legal certainty for the finality of the settlement and use of margin and other settlement assets involved in the futures and OTC derivatives transactions.

The recognition of close-out netting is a historic milestone in China's derivatives market legislation process. We believe the Futures and Derivatives Law will lay a solid legal foundation for the opening-up of China's futures and OTC derivatives markets, and further promote the openness and cooperation among global financial markets.

In 2021, China made a major breakthrough in the legalization of the financial markets. In April 2021, China's top legislature, the National People's Congress of China ("NPC") deliberated and published the "Futures Law of the People's Republic of China (draft)". In October 2021, the revised draft of the Futures Law, renamed as "Futures and Derivatives Law of the People's Republic of China" (hereinafter "the Futures and Derivatives Law") was submitted to the NPC for a second reading and public consultation. In April 2022, after the third reading, the Standing Committee of the NPC approved the Futures and Derivatives Law, which will come into force on August 1 this year. The introduction of the legislation is the first time for China to take the legal and regulatory framework, rules, and regulations of derivatives market to the country's top legislature, further enhancing the systemic foundation of Chinese ETD and OTC derivatives markets, which has a profound impact on promoting the high-quality development and the opening-up of derivatives markets in the world's second largest economy.

10.1.1 INTRODUCTION TO THE FUTURES AND DERIVATIVES LAW

In 2021, the total trading volume of China's futures market hit 7.51 billion lots, with trading turnover exceeding Renminbi ("RMB") 580 trillion. As for the OTC derivatives market, China's interbank derivatives posted a cumulative turnover of over RMB 160 trillion in 2021. China's futures and derivatives market is in a critical period, evolving from quantity expansion to quality improvement. Hence, the Futures and Derivatives Law focuses on the reform direction of marketization and legalization, actively adapts to international standards and follows the development trend of the global markets and ensures the standardized and healthy development of the financial derivatives market under the premise of preventing systemic risks and safeguarding financial security.

The Futures and Derivatives Law governs both the futures markets and OTC derivatives markets. The general provisions in the Futures and Derivatives Law distinguish between the legal concepts of "futures transactions" and "derivatives transactions". Under this Law, "futures transactions" refer to transactions with futures contracts or standardized option contracts as trading objects, and "derivatives transactions" refer to transactions other than futures transactions, with swap contracts, forward contracts and non-standardized option contracts, as well as any combination of such contracts as trading objects. In terms of the market development, the China's futures and OTC derivatives markets are at different levels of development, with the futures market having operated steadily for more than 30 years and accumulated extensive regulatory

experiences. While the OTC derivatives market is still in the continued exploration and development stage, with less than 20 years of development. Therefore, the Futures and Derivatives Law incorporates the current development of both markets, providing for a comprehensive legal and regulatory framework for the operation of the futures market and also guidance for the standardized development of the OTC derivatives market. The chapter dedicated to “derivatives transactions” in the Futures and Derivatives Law is conducive to the cohesive development of both ETD and OTC derivatives markets in China.

10.1.2 IMPORTANT IMPLICATIONS FOR THE DEVELOPMENT OF CHINA'S FINANCIAL DERIVATIVES MARKET

First, the Futures and Derivatives Law provides for legislative-level certainty on the settlement finality. The finality concept is a cornerstone for a robust clearing system. Currently, China’s futures and OTC derivatives markets rely primarily on the Securities Law and the Contract Law, as well as judicial interpretations by relevant judicial authorities, to ensure finality for futures transactions and derivatives transactions in practice. The Futures and Derivatives Law clearly provides for both trading and settlement finality for futures and OTC derivatives transactions, which will encourage more domestic and international market participants to turn to China's derivatives market to hedge and manage risks. For the futures market, Article 26 of the Futures and Derivatives Law provides that, subject to exceptional conditions affecting the normal trading of futures, the trading outcome conducted in accordance with the rules of a futures exchange shall not be altered. Furthermore, Article 43 sets out that clearing and settlement of futures conducted in accordance with the law will not be suspended, invalidated, or revoked as a result of the commencement of bankruptcy proceedings in respect of any party participating in the clearing and settlement process.

For the OTC derivatives market, the Futures and Derivatives Law recognizes the legal certainty and enforceability of the single agreement and close-out netting. Article 32 recognizes the concept of a single agreement for OTC derivatives trades, acknowledging that the master agreement, together with its schedule or supplement and all the confirmations relating to each OTC derivatives transaction entered into under the master agreement shall constitute a legally binding single agreement, which prevents the insolvent party from “cherry-picking” individual derivatives transactions in the event of default. Article 35 specifically recognizes the enforceability of close-out netting in the event of counterparty insolvency. The recognition of the concept of the single agreement and enforceability of close-out netting in the Futures and Derivatives Law will enable market participants to measure their credit and risk exposures to Chinese derivatives counterparties on a net basis and significantly reduce transaction and regulatory costs, which is critical for the development and opening-up of derivatives markets in China.

The Futures and Derivatives Law further enhances the legal basis for the central clearing in China’s OTC derivatives markets. China has had mandatory clearing of OTC RMB Interest Rate Swaps on the Shanghai Clearing House in place since 2014. Shanghai Clearing House is recognized by the People's Bank of China (the central bank of China) as a Qualifying Central Counterparty (“QCCP”) in China’s OTC derivatives market. Article 37 of the Futures and Derivatives Law recognizes the enforceability of close-out netting of OTC derivatives transactions cleared through CCPs. The central clearing of derivatives conducted in accordance with the law must not be affected by the bankruptcy of any party. This lays an indispensable legal foundation for Shanghai Clearing House to perform its role of the systemic risk manager in the China’s OTC derivatives market.

Second, the Futures and Derivatives Law provides legal protection for the timely execution and settlement of margin and other settlement assets involved in the futures and OTC derivatives transactions. Currently, Articles 158 and 159 of the Securities Law of the People's Republic of China ensure that securities clearing institutions can dispose of the securities, funds, and collateral for settlement in accordance with business rules and shall not be subject to enforcement. In terms of the central clearing of OTC derivatives, agreements and rules established based on the Contract Law currently ensure the effectiveness of timely execution and settlement of margin in practice.

Article 43 of the Futures and Derivatives Law provides that the assets collected and withdrawn by a futures clearing institution in accordance with its business rules (including margin, option premium, settlement security

deposit, and risk reserve fund) shall be applied first for clearing and settlement, and shall not be impounded, frozen, seized, or subject to any compulsory enforcement. Pending completion of the clearing and settlement of a trade, no person shall use any margin (that are designated to secure the performance and settlement) or any asset due for settlement process of the trade. Article 41 provides that where marketable securities are used as margin, futures clearing institutions or clearing participants may dispose of the securities in forced liquidation according to the law.

In terms of OTC derivatives market, other than the protections described above (single agreement, close-out netting), article 37 of the Futures and Derivatives Law extends the protection provided by article 43 to the central clearing of OTC derivatives. This provides legal certainty for the finality of the settlement and use of margin, settlement security deposits and other assets in central clearing of OTC derivatives transactions.

Thirdly, the Futures and Derivatives Law provides legal basis for the registration of cross-border futures business. Chapter 11 provides that offshore futures trading venues providing services to the onshore market shall apply for registration with the futures regulatory authority under the State Council, except as otherwise provided. Foreign institutions engaging in marketing, promotion, and solicitation of futures transactions within the territory will require approval by the futures regulatory authority under the State Council. While this law lays the legal foundation for the opening-up of China's futures market, international market participants are looking forward to the formulation of key operative provisions in the future.

It has become an international consensus to adopt the principle of "regulatory deference" to achieve cross-border regulatory cooperation. Embracing approaches of international comity, where jurisdictions and regulatory authorities defer to one another based on comparable regulatory and supervisory frameworks relative to applicable international standards, has been proven to be effective in practice. It helps protect and advance market participants' access to markets on a cross-border basis, while supporting financial stability. CCP12 encourages the regulatory agencies to adopt an approach of regulatory deference when drafting the cross-border rules. In November 2021, during the second public consultation of the Futures and Derivatives Law, CCP12 submitted its response⁵⁷ to the NPC, suggesting that the principle of "regulatory deference" should be adopted, to promote the prosperity and openness of financial markets.

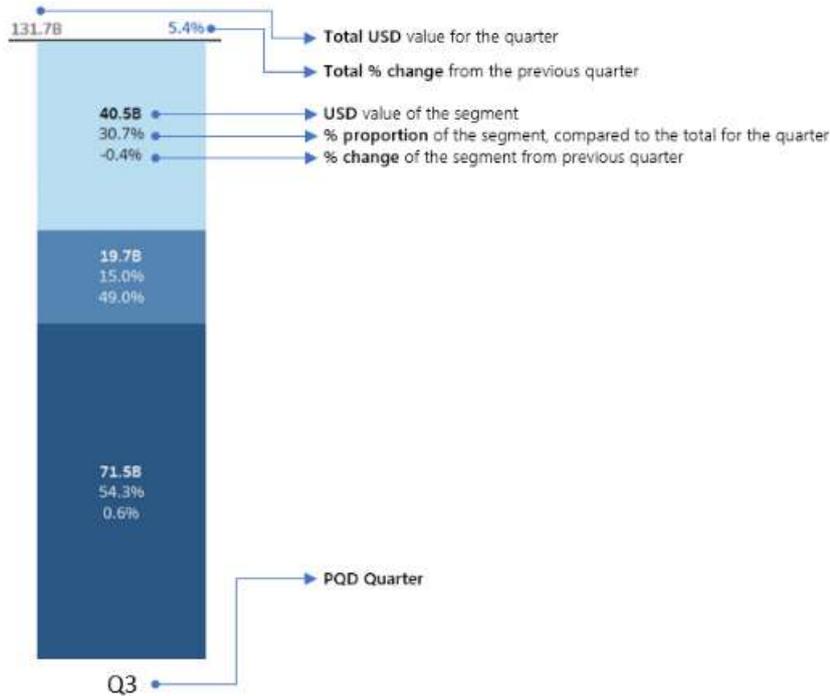
10.1.3 SUMMARY

We are glad to see that the Futures and Derivatives Law provides a comprehensive legal and regulatory framework for China's futures and OTC derivatives markets. The recognition of close-out netting is a historic milestone in China's derivatives market legislation process. We believe the Futures and Derivatives Law will lay a solid legal foundation for the opening-up of China's futures and OTC derivatives markets, and further promote the openness and cooperation among global financial markets.

⁵⁷ CCP12, Response to the China Futures Law public consultation (November 2021), available at [Link](#)

11. APPENDIX I: FOR SECTIONS 1.1.8 AND 4.2 – BAR CHART KEY

For certain margin for uncleared derivatives and PQD charts in sections 1.1.8 and 4.2 respectively, bar charts may have three values per bar segment. These can be interpreted as follows:



12. ABOUT CCP12

CCP12 is the global association for CCPs, representing 40 members who operate over 60 individual central counterparties (CCPs) across the Americas, EMEA, and the Asia-Pacific region.

CCP12 promotes 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@ccp12.org or through our website by visiting www.ccp12.org.

13. CCP12 MEMBERS

