



Revisiting Procyclicality: The Impact of the COVID Crisis on CCP Margin Requirements

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About FIA

FIA is the leading global trade organization for the futures, options and centrally cleared derivatives markets, with offices in Brussels, London, Singapore and Washington, D.C.

FIA's mission is to:

- *support open, transparent and competitive markets,*
- *protect and enhance the integrity of the financial system, and*
- *promote high standards of professional conduct.*

As the leading global trade association for the futures, options and centrally cleared derivatives markets, FIA represents all sectors of the industry, including clearing firms, exchanges, clearing houses, trading firms and commodities specialists from about 50 countries, as well as technology vendors, lawyers and other professionals serving the industry.



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EXECUTIVE SUMMARY

This paper provides a clearing member perspective on the dramatic increase in margin requirements at derivatives clearinghouses during the first quarter of 2020. The paper quantifies the rise in margin requirements at the level of individual contracts as well as the overall increase in initial margin posted at the clearinghouses. The paper acknowledges the overall resilience of the clearing system during this period, but argues that this increase in margin requirements demonstrates the overly procyclical nature of clearinghouse margin models and warns that this procyclicality threatens to increase the global financial system's liquidity risk. The paper urges all stakeholders in the global clearing system to consider what steps can be taken to mitigate the procyclicality of margin models and proposes several recommendations to address this issue.

INTRODUCTION

For the global derivatives markets, the spring of 2020 provided a powerful real-world stress test of the regulatory reforms put in place after the 2008 crisis.

The spread of the COVID-19 virus triggered unprecedented volatility and extremely high levels of trading activity in a wide range of financial and commodity markets. The extraordinary market turmoil, combined with the operational challenge of industry-wide “work from home” conditions, put enormous pressure on the trading and clearing infrastructure of the global derivatives markets.

The good news is that in spite of this pressure, the derivatives markets did not suffer from the kinds of problems seen during the global financial crisis of 2008. There was no collapse of confidence in counterparties, there was no breakdown in the settlement of trades, and the markets remained open and fully functioning throughout.

One important reason for this difference was the increased use of central clearing for over-the-counter derivatives. This type of market infrastructure was already in place for exchange-traded derivatives prior to the 2008 crisis, and a core goal of the post-crisis reforms was to expand its use for OTC derivatives. As a result, today approximately 80% of interest rate swaps, the largest segment of the OTC derivatives markets, are cleared by central counterparties according to the [Bank for International Settlements](#).

This increase in the use of central clearing has helped ensure the mitigation of credit risk and improve the stability of the financial system. Even during the peak of the volatility in the spring of 2020, derivatives trading did not grind to a halt out of fear that a counterparty might default. Higher standards for capital and liquidity for the major derivatives dealers, another critically important pillar of



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the post-crisis reforms, played a key role in providing that confidence. But equally important, market participants could rely on clearinghouses for protection from loss in case of a default.

The other side of the coin, however, is the liquidity implications of the increase in collateralization. As the global derivatives markets have expanded their use of central clearing, a higher proportion of the outstanding positions have become subject to the margin requirements set by the clearinghouses. This has the positive effect of reducing the potential loss if one or more counterparties cannot fulfill their obligations, but it also increases the demand for liquid, high-quality assets to meet margin calls.

This is especially problematic during periods of market stress, as happened during the spring of 2020. Large, sudden increases in margin requirements create a type of negative feedback loop called “procyclicality.” The increase in margin requirements drives demand for liquid assets, which in turn increases the scarcity of those assets and intensifies the turmoil in the financial markets that triggered the increase in margin requirements.

The potential for procyclicality in margin requirements is not a new concern for the derivatives markets. During the implementation of the post-crisis reforms, policymakers were well aware that the increase in central clearing could lead to greater liquidity risk, and they called on derivatives clearinghouses, also known as central counterparties (CCPs), to address this issue.

In March 2010, the Bank for International Settlements published a [report](#) recommending several measures to reduce the procyclicality arising from margin practices. In April 2012, the Committee on Payments and Markets Infrastructures and the International Organization of Securities Commissions addressed this issue in [the final version of Principles for Financial Market Infrastructures](#), saying central counterparties should set “relatively stable and conservative margin requirements that are specifically designed to limit the need for destabilizing, procyclical changes.”

In July 2017, CPMI and IOSCO addressed this issue again in their [Further Guidance on the PFMI](#). That guidance included a section with specific recommendations for mitigating procyclicality in the setting of initial margin. In particular, Section 5.2.38 of the Further Guidance acknowledges that procedures designed to limit procyclical changes to margin may create additional costs for both clearinghouses and their participants, but states that these procedures “may also result in additional protection and potentially less costly and disruptive adjustments in period of high market volatility.”

Most recently, the European Systemic Risk Board published a report in January 2020 on [Mitigating the procyclicality of margins and haircuts in derivatives](#)



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[markets and securities financing transactions](#). The paper set out a number of “possible policy options,” including margin floors to prevent initial margins from falling to excessively low levels. The paper also urged regulatory standard-setters and industry representatives to develop detailed regulatory standards in this area.

This issue of procyclicality has now been thrust to the forefront by the recent market turmoil. FIA estimates that the spike in volatility observed during the first and second quarters of 2020 caused an extreme shock to margin requirements in many asset classes. Using data from the quarterly public quantitative disclosures published by a sample group of large derivatives clearinghouses in the US, Europe and Japan, FIA estimates that the aggregate amount of initial margin rose from \$563.6 billion at year-end to \$833.9 billion at the end of the first quarter. In other words, the amount of collateral posted to clearinghouses to meet initial margin requirements increased by \$270.3 billion, or 48%, during the first quarter of 2020. In the US alone, the total amount of customer collateral in clearing accounts rose by more than \$136 billion in the month of March, more than six times larger than any previous single month increase in the history of the industry.

The size of these margin calls did not overwhelm the derivatives markets or cause them to fail. But it did put extreme pressure on the availability of cash and other high-quality liquid assets to meet these margin calls. During late February and early March, this trend contributed to an abrupt and disorderly “dash for cash” across the financial markets that caused extreme dislocations in the US Treasury markets.¹ Although central bank action starting in the second half of March mitigated the liquidity squeeze and ensured that it did not translate to a credit crisis, FIA believes this recent experience demonstrates the need for all stakeholders in the global clearing system to further evaluate ways to reduce the procyclical effects of margin requirements.

There are three main reasons why we believe procyclicality needs to be addressed. The first is related to the funding of margin calls and the challenges they create for clearing members and their customers. The unprecedented size of the margin flows, combined with the steep increase in the number of changes to margin requirements, created a considerable amount of operational stress on the ability of clearing members to locate and deliver the necessary amounts of collateral.

In addition, large margin calls were not restricted just to end-of-day margin payments. Many clearinghouses have the option of using intraday calls, rather

1 See <https://www.bankofengland.co.uk/bank-overground/2020/what-role-did-margin-play-during-the-covid-19-shock>, <https://libertystreeteconomics.newyorkfed.org/2020/04/treasury-market-liquidity-during-the-covid-19-crisis.html>, <https://www.bis.org/publ/bisbull02.htm>, and https://www.financialresearch.gov/briefs/files/OFRBr_2020_01_Basis-Trades.pdf



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than end-of-day calls, to address unusual volatility or large intraday losses. Intraday calls are an important tool for clearinghouse risk management, but they create funding challenges for clearing members, especially when they are used on an *ad hoc* basis. During the spring of 2020, several clearinghouses significantly increased their use of *ad hoc* intraday calls, adding to the operational pressures on clearing members.

These funding challenges could have turned into a more serious problem if a clearing member had been unable to meet the margin call deadlines. Under clearinghouse rules, a failure by a clearing member to meet margin calls could result in that firm being declared in default in very short order. Furthermore, many clearinghouse rulebooks contain clauses that allow them to declare a default if one of their members defaults at an unrelated clearinghouse. Therefore, failure to make prompt payments at any single clearinghouse could result in that clearing member being called into default across multiple clearinghouses. In other words, this operational stress could become a source of systemic risk.

The second main reason to address procyclicality is that its effects spill over into other financial markets. For example, during the peak of the market volatility in March, there were alarming signs of liquidity shortages in the US repo market, which is closely linked to the futures markets through various funding arrangements and trading strategies. Fortunately, the US Federal Reserve reacted quickly with a range of measures to address this situation, and the moment of danger passed. But in FIA's view, relying on emergency actions by central banks is not a good foundation for managing liquidity risk across the financial markets.

The third reason is that the discussion on procyclicality could have important consequences for competition and systemic risk. Most major clearinghouses are part of publicly traded companies that are run on a for-profit basis for their shareholders. Competition among clearinghouses is a fact of life. In this context, a set of globally consistent standards to mitigate procyclicality would reduce the potential for "race to the bottom" behavior in margin practices, and steer competition to other areas such as operational efficiency and technology innovation.

Furthermore, there are a large number of clearinghouses in the global derivatives markets. Even though many of them are relatively small, they are critical to the stability of local markets and the availability of collateral in those local markets. In addition, many of the smaller clearinghouses are interconnected to the major clearinghouses through overlaps in their membership. That adds to the liquidity pressures on the global clearing banks during periods of market stress, when many clearinghouses issue large margin calls at the same time. This combination of competition and interconnectedness in the global clearing system makes it all the more important to address the issue of procyclicality in a comprehensive way.



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With this paper, FIA seeks to promote dialogue on the issue of procyclicality in clearinghouse margin requirements. The paper consists of three main parts: an explanation of the role that margin plays in derivatives markets; an empirical assessment of the increase in margin requirements observed in the first half of 2020; and a set of recommendations for reducing procyclicality and improving margin models in cleared markets.

The recommendations fall into three groups. First, we call for improvements to the design and application of **margin floors**, one of the main tools for controlling procyclicality. Although many clearinghouses have set limits on how far margin can fall during periods of low volatility, we believe that the extremely large increases in margin observed during the spring of 2020 demonstrated that margin floors at many CCPs were not sufficiently effective and need to be strengthened.

Second, we recommend that clearinghouses enhance the design of their margin models by measuring the potential for large and sudden increases in initial margin and using those measurements in the calibration of margin levels. The goal is to define the extent of change that would cause significant stress for clearing members and the financial system. While we do not recommend a hard limit on the rate of change, we do recommend that each clearinghouse should use this input to set a target for the **maximum rate of change** over a defined period of time and then disclose that to its regulators and its clearing members. This would have the benefit of clarifying expected maximum amounts of funding required from clearing members during periods of extreme stress, while preserving the ability of each clearinghouse to tailor its margin models to the specific characteristics of each market.

Third, we call on clearinghouses to change the way they use **intraday margin calls**. We recognize that this is an important tool for clearinghouse risk management, but it puts considerable pressure on the ability of clearing members to source and deliver collateral in a short period of time, especially when the calls are not scheduled or come late in the day. We therefore set forth several principles to guide the use of this risk management tool.

Finally, the paper includes several general recommendations for **improvements to margin models**. Although these recommendations are not aimed specifically at mitigating procyclicality, we believe that improvements to margin models will make them more robust and dampen procyclical effects.



PART 1: FUNCTION AND PURPOSE OF MARGIN

In the cleared derivatives markets, initial margin is the first line of defense against losses from a customer or member default (see the FIA position paper on CCP risk management [published in April 2015](#) and [updated in November 2018](#)).

Initial margin is set by clearinghouses, either independently or in conjunction with affiliated exchanges. It is collected from each customer, based on the customer's outstanding positions, and then posted to the clearinghouse by the customer's clearing firm, known in the US as a futures commission merchant and in Europe as a general clearing member.

Initial margin is generally equivalent to the clearinghouse's estimate for the potential loss over a short time horizon, typically 1-3 days for exchange-traded derivatives and 5-7 days for OTC derivatives, to provide time for a clearinghouse to hedge, port or liquidate the defaulting firm's positions. Those estimates of potential loss are derived from both the current level of price volatility and historical data on extreme price movements. When volatility changes, clearinghouses adjust the level of initial margin for both new and existing positions. In addition, margin levels are affected by several other components of clearinghouse margin models, such as confidence intervals and lookback periods.

Clearinghouses also collect variation margin, which is based on changes in the value of a position. Each day the clearinghouses recalculate the value of all outstanding positions and pay and collect variation margin to cover the change in value. Customers receive variation margin for positions that increase in value and pay variation margin for positions that decline in value. If a customer cannot meet a margin call to cover its trading losses within the timeframes established by its clearing member, the clearing member has the power to liquidate the customer's positions and use the initial margin to cover any shortfall.

Initial margin typically is collected when a position is established, and then increased or reduced when the clearinghouse adjusts its requirements. Adjustments typically come at the end of the trading day, but clearinghouses also have the ability to make intraday calls on either a routine or *ad hoc* basis. The latter type of call tends to happen infrequently, and it usually is triggered by exceptional volatility or large increases in customer positions. Intraday calls can be applied to all members or to individual members, depending on the circumstances.

Initial margin is not the only protection against losses. Clearinghouses also maintain several other layers of financial resources to absorb losses, including the clearinghouse's own capital and the mutualized default fund to which all members of the clearinghouse contribute.



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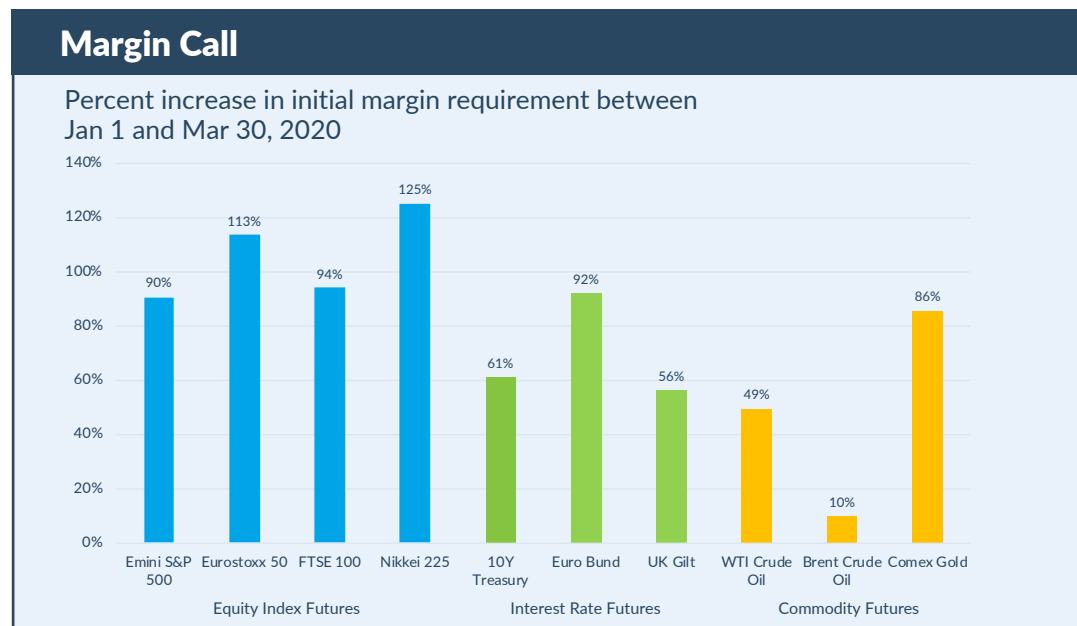
However, initial margin is the first line of defense, and it is absolutely critical to size it appropriately. Not only does it help protect all the other participants in a market, it also functions as a source of market discipline by putting the risk of loss onto the entity that brings that risk to the market. This is the core principle of the “defaulter pays” model for allocating losses.

PART 2: IMPACT OF THE PANDEMIC

2.1 Analyzing Contract-Level Data

It is not unusual for clearinghouses to increase initial margin requirements during periods of market volatility. But the turmoil that took place in March, when markets crashed and then rebounded in an exceptionally short period of time, prompted a rapid increase in initial margin requirements over just a few trading days.

The increases were especially noticeable in exchange-traded futures. As the chart below shows, initial margin requirements at the per-contract level rose by more than 100% for certain equity index futures between the beginning and the end of the first quarter of 2020. Certain interest rate futures and commodity futures also had substantial increases in initial margin requirements.



Source: data published on CCP websites and provided by FIA member firms



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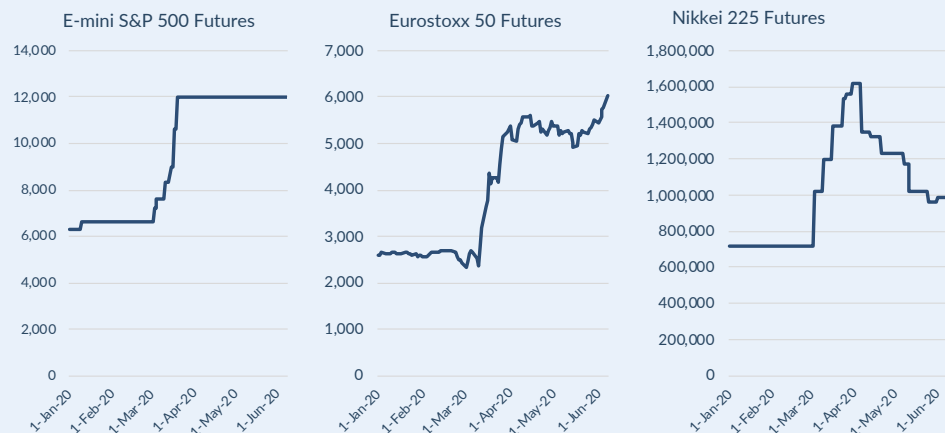
One example was the E-mini S&P 500 futures contract, the flagship of the equity complex at CME Group and the most heavily traded equity index futures in the US. The initial margin requirement began the year at \$6,300 per contract and by March 2 it had risen to \$6,600. Then the pandemic hit, and over the next three weeks CME's clearinghouse increased the initial margin requirement six times in reaction to the extreme price movements during that time. By March 23, the initial margin requirement had been raised to \$12,000 per contract, nearly double the amount at the beginning of the year.

A similar pattern can be observed in the initial margin requirements for the Eurostoxx 50 futures, the most actively traded equity index futures contract in Europe. From January 1 through March 10, the initial margin requirement for this contract stayed within a range of 2,300 to 2,700 euros per contract. Then it began a rapid rise to more than 5,100 euros by March 27 and to more than 5,600 euros by April 15. As with the E-mini S&P 500, the initial margin requirement doubled over less than a month.

Turning to the Asia-Pacific region, the Nikkei 225 futures traded on the Japan Exchange Group saw a similar leap in initial margin requirements. The Japan Securities Clearing Corporation, the clearinghouse for JPX trades, increased the requirement six times in March, raising it from 720,000 yen on March 2 to 1.62 million yen by March 30. Over the course of the month, the initial margin requirement increased by a total of 125%. However, starting April 7 there were six reductions and by the beginning of June the initial margin requirement was back under the one million mark.

Spike in Margin Requirements: Equity Index Futures

Per contract margin requirements for three benchmark equity index futures, daily changes from Jan 1 to Jun 8, 2020



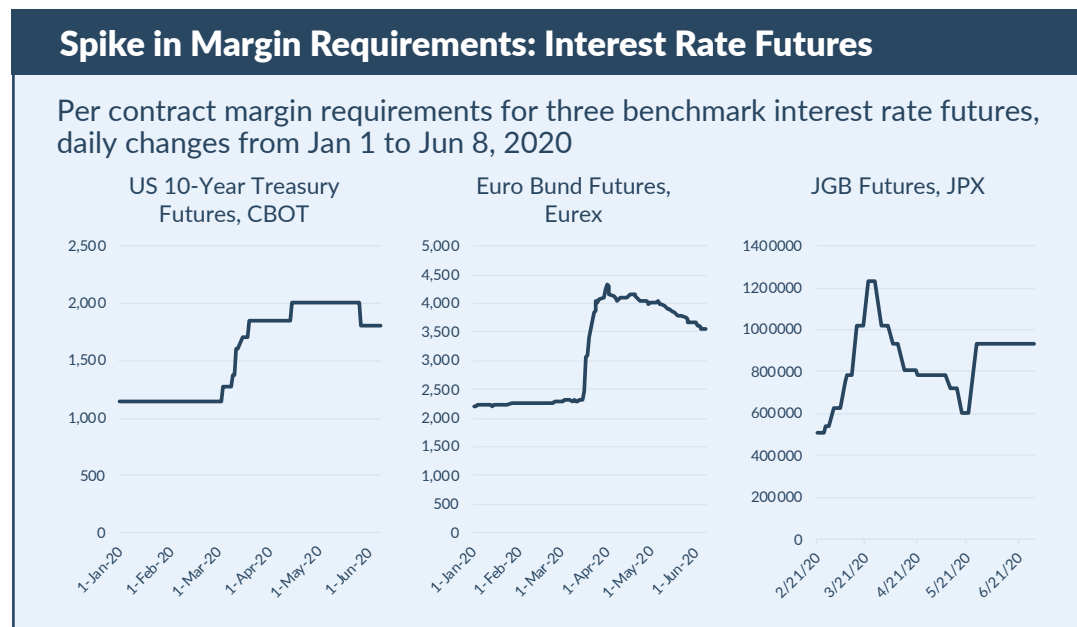
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Source: data published on CCP websites and provided by FIA member firms

Similar increases affected the leading interest rate futures in the US and Europe. The initial margin requirement for 10-year Treasury futures traded on the Chicago Board of Trade, the most important benchmark for long-term interest rates in the US, stayed at \$1,150 per contract from the start of the year until March 3, then rose five times over the next three weeks. By the end of the month, the requirement was \$1,850, an increase of 61%.

The initial margin requirement for Euro Bund futures traded on Eurex, the equivalent benchmark for European interest rate markets, had an even larger jump. It rose gradually from 2,212 euros per contract at the start of the year to 2,303 euros per contract at the beginning of March. It then rose extremely rapidly, ending the month at 4,323 euros per contract, an increase of 88% over just four weeks.

A somewhat different pattern emerged with the Japanese Government Bond futures traded on JPX. As with the other bond futures, the initial margin requirement on JGB futures rose very rapidly during February and March, moving from 510,000 yen on February 21 to 1,230,000 yen by March 23, an increase of 141% over four weeks. Unlike the other bond futures, however, the initial margin requirements for JGB futures continued to be highly volatile. Over the next nine weeks it changed six times, bringing the level down to 600,000, then it abruptly jumped back up to 930,000 on May 26.



Source: data published on CCP websites and provided by FIA member firms

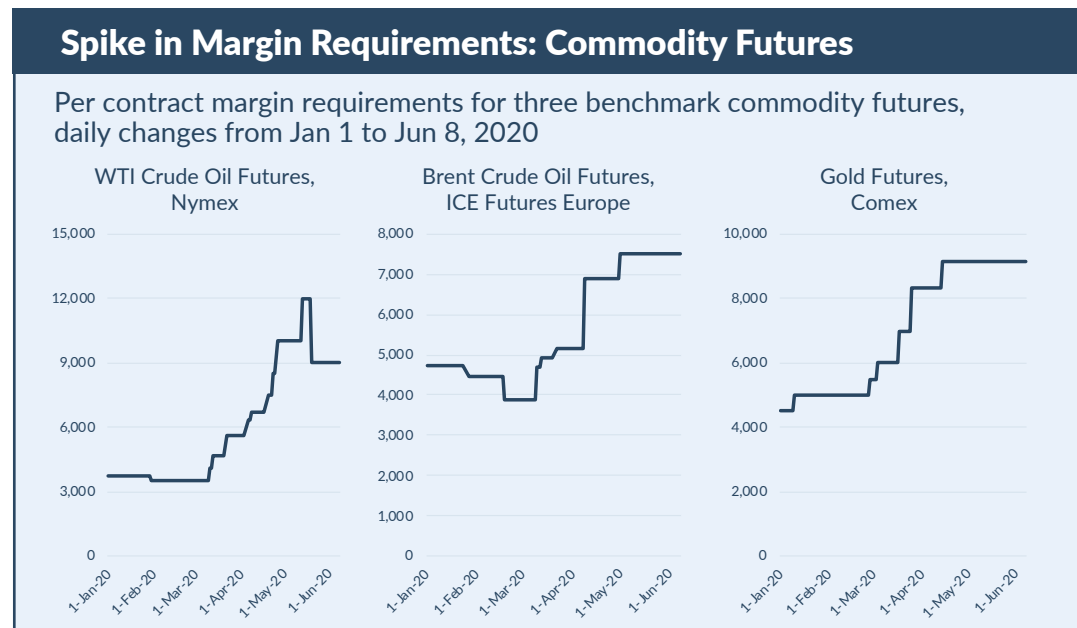


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The commodity sector saw similar jumps in initial margin requirements. The WTI crude oil futures traded at CME jumped from \$3,500 per contract in early March to \$5,600 by the end of March, an increase of 60% over less than four weeks. The initial margin requirement then continued to rise amid extreme conditions in the US oil market. By mid-May, the initial margin per contract had peaked at \$12,000 per contract, an increase of 243% over 10 weeks.

The initial margin for Brent oil futures traded on ICE Futures Europe rose from \$3,180 per contract in early March to \$5,170 by the end of the month, an increase of 63%. Initial margin then continued to rise, reaching \$7,500 in early May.

The COMEX gold futures traded on CME, a key benchmark for the global bullion market, jumped from \$5,000 at the end of February to \$9,150 by mid-April, an increase of 83%. During that period, the initial margin requirement was adjusted six times.



Source: data published on CCP websites and provided by FIA member firms

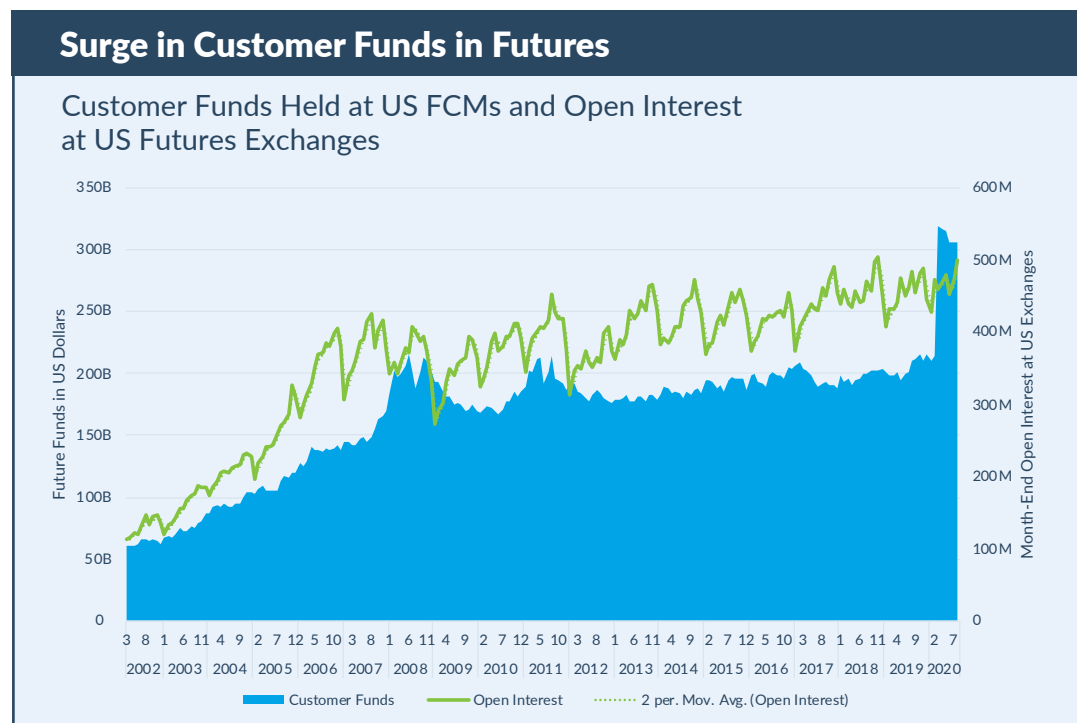


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2.2 Quantifying the Impact on Customer Funds

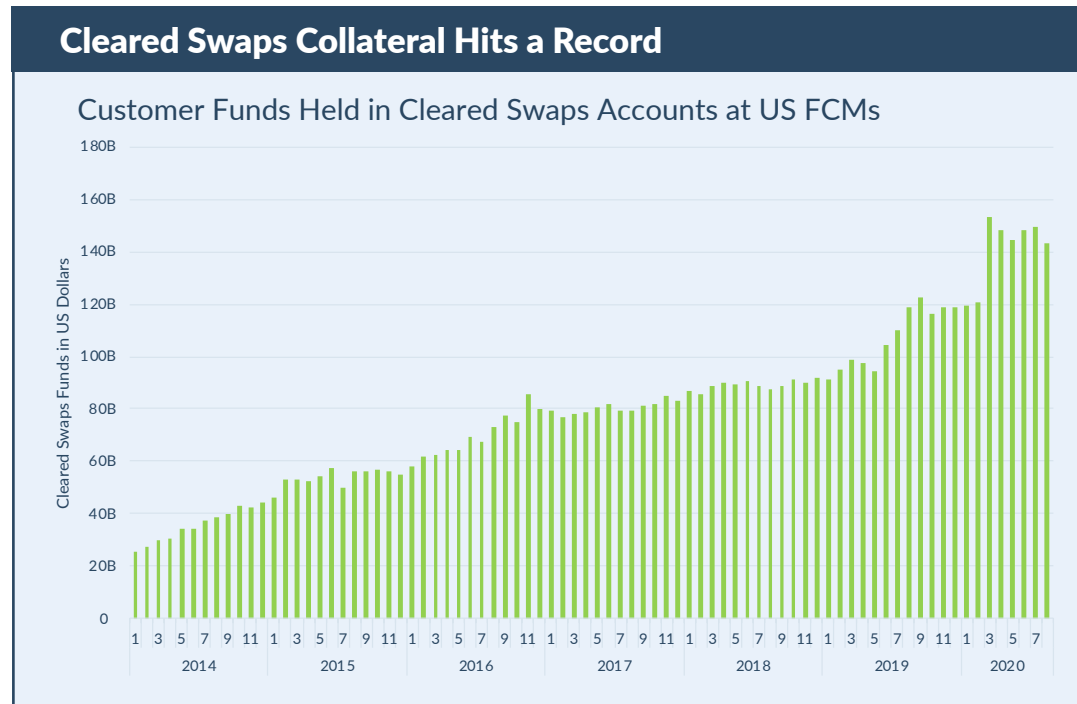
As these examples show, initial margin requirements at the per-contract level went up dramatically during March. What about the overall impact on the market?

One way to measure that is to look at the amount of money that customers held in their accounts at clearing firms, which is closely correlated to the initial margin requirements on their outstanding positions. Data published by the Commodity Futures Trading Commission, the primary regulator of derivatives markets in the US, shows that total customer funds in futures accounts stood at \$214 billion at the end of February. One month later, that amount had risen to \$318 billion, an increase of \$104 billion in a single month.



Source: Commodity Futures Trading Commission, FIA FCM Tracker

The CFTC data show a similar but smaller increase in customer funds in the swaps accounts at US clearing firms. Total customer funds in cleared swaps accounts stood at \$121 billion at the end of February. One month later, that amount had risen to \$153 billion, an increase of \$32 billion in a single month.



Source: Commodity Futures Trading Commission, FIA FCM Tracker

On a combined basis, customers posted \$136 billion in additional collateral in a single month to cover the margin requirements on their cleared derivatives. This increase was unprecedented in the history of the industry in terms of both size and speed. Prior to 2020, the largest single month increase in customer funds at US clearing firms, which took place during the financial crisis of 2008, was less than \$20 billion.

2.3 Quantifying the Impact on CCP initial margin

Another way to measure the overall impact is to look at the amount of initial margin collected by clearinghouses. Since the third quarter of 2015, all central counterparties have made quarterly disclosures of certain quantitative information in line with standards set by the Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions. As CPMI-IOSCO stated in 2015 when the standards were published, these disclosures can provide the public with a powerful tool for understanding the financial resources held by derivatives clearinghouses and their exposures to losses in case of a default.

To examine the impact of the “great lockdown” on initial margin amounts, FIA analyzed disclosures from a sample group of major clearinghouses. These clearinghouses are: CME Clearing, Eurex Clearing, ICE Clear Credit, ICE Clear US,

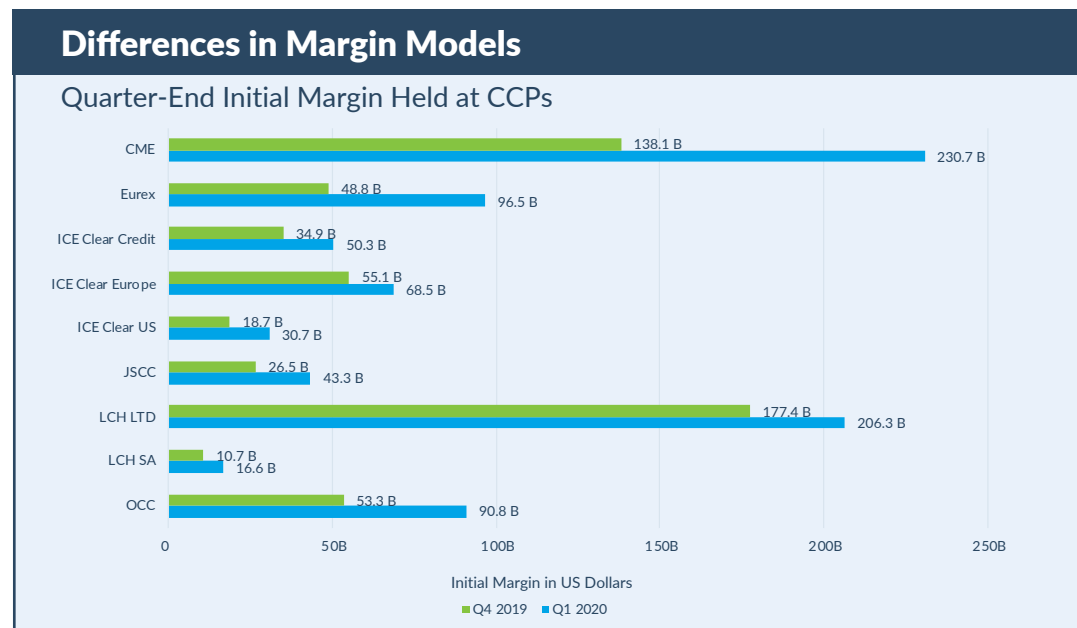


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ICE Clear Europe, Japan Securities Clearing Corporation, LCH Limited, LCH SA and OCC. This group of clearinghouses offers clearing services for both listed and OTC derivatives across many asset classes, and FIA believes the data in their disclosures provides a meaningful proxy for estimating the impact of volatility on margin requirements. In some cases, the disclosures cover not only derivatives but also certain other financial instruments such as cleared repos and cash equities. Wherever possible, FIA has excluded clearing services for those instruments in order to focus on derivatives.

According to FIA's analysis, total initial margin at this sample group of CCPs rose from \$563.6 billion at the end of 2019 to \$833.9 billion at the end of the first quarter of 2020, an increase of \$270.3 billion or 48%.

There was a large amount of variance within the sample group. As shown in the chart below, the rise in initial margin ranged from \$92.6 billion at CME at the high end to \$9.7 billion at LCH SA at the low end. The variance among the clearinghouses reflects differences in product mix as well as margin methodologies.



Source: Public Quantitative Disclosures, FIA CCP Tracker

Note: LCH LTD and LCH SA data include only initial margin for cleared derivatives

For example, at CME Group's clearinghouse, total initial margin across all accounts reached \$230.7 billion at the end of the first quarter, versus \$138.1 billion at the end of the fourth quarter, an increase of 67% or \$92.6 billion. Breaking that down by clearing service, the total initial margin for CME's "base" clearing service, which covers the futures and options that trade on its exchanges, reached \$190.4 billion



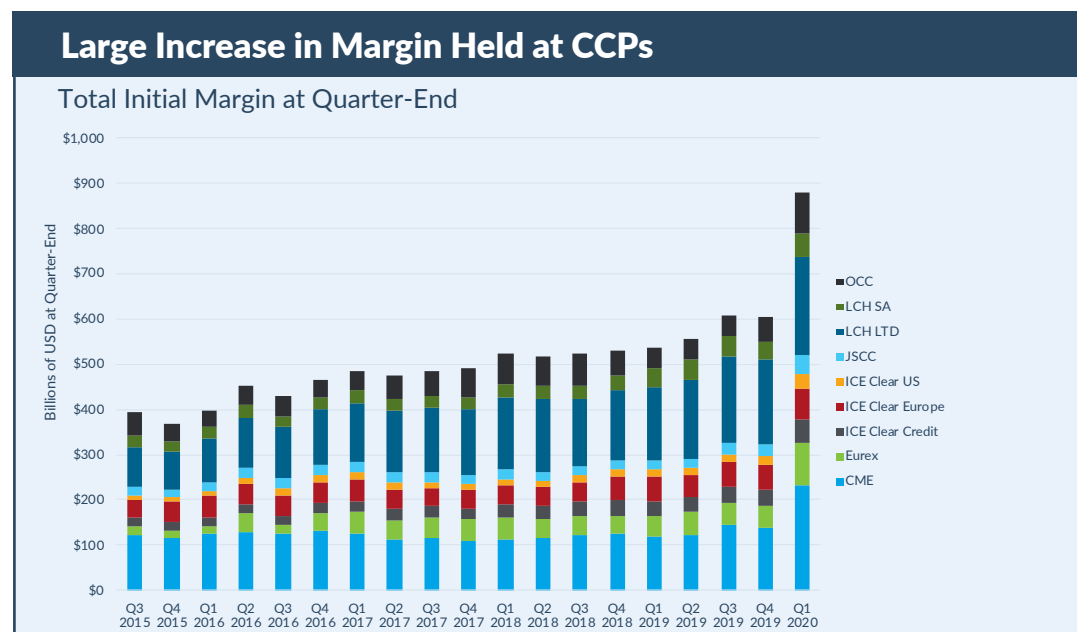
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in the first quarter, versus \$108.8 billion in the fourth quarter, an increase of 75% or \$81.6 billion. The total initial margin for OTC interest rate derivatives cleared at CME reached \$40.3 billion in the first quarter, versus \$29.3 billion in the fourth quarter, an increase of 38% or \$11 billion.

At LCH Limited, the UK arm of the LCH Group, total initial margin for its interest rate derivatives, which includes OTC interest rate derivatives processed through its SwapClear service and exchange-traded interest rate futures listed on CurveGlobal, reached \$201.4 billion in the first quarter, versus \$171.7 billion in the fourth quarter, an increase of 17% or \$29.7 billion. Total initial margin for its foreign exchange derivatives actually declined during the quarter, falling from \$5.73 billion to \$5.28 billion, a decrease of 8% or \$451 million.

At Eurex Clearing, total initial margin across all cleared derivatives, including OTC interest rate swaps as well as exchange-traded futures and options, reached \$96.5 billion in the first quarter, versus \$48.8 billion in the fourth quarter, an increase of \$47.7 billion or 98%.

Taking a more long-term perspective, we compared the increase in total initial margin during the first quarter of 2020 to similar data going back to the third quarter of 2015, which was when the CCPs began to publish these data. As the chart below shows, the total amount held at the sample group of large CCPs has been gradually rising over this time period. However, the rate of change was relatively low. In fact, the increase we saw in the first quarter of 2020 was more than all previous quarterly increases combined.



Source: Public Quantitative Disclosures, FIA CCP Tracker

Note: LCH LTD and LCH SA data include initial margin for cleared derivatives only.

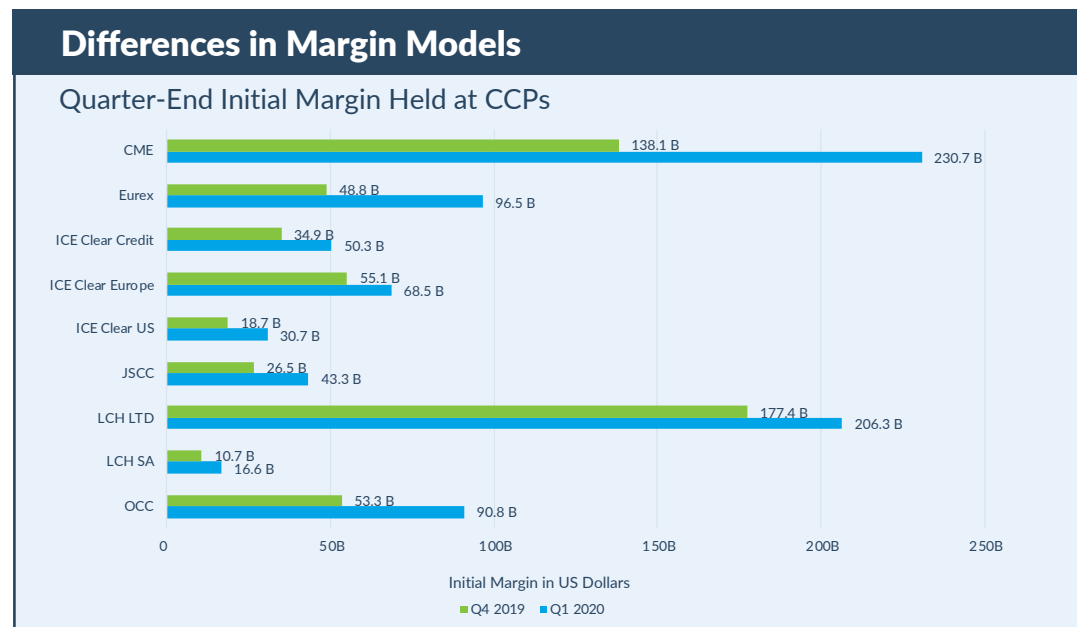


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The surge in the amount of initial margin collected during the first quarter was even more pronounced at the day-to-day level. CCPs are required to disclose on a quarterly basis the maximum amount of additional initial margin called during a single day of that quarter. These data are important because they indicate the upper boundary of the funding requirements related to initial margin that clearing members face on a daily basis.

Using the public disclosure data, FIA estimates that single day initial margin calls reached a much higher peak in the first quarter of 2020 than the fourth quarter of 2019 at nearly all clearinghouses in the sample group. At six out of the nine clearinghouses in the sample group in FIA's analysis, the peak single day initial margin call in the first quarter was more than three times the peak in the fourth quarter.

These data cover the aggregate amounts collected from all clearing members on the peak day, rather than the amount that any single member had to post. It is therefore difficult to determine the impact on individual clearing members. Even so, the increased size of the additional calls illustrates the funding pressures on clearing members during the first quarter.



Source: Public Quantitative Disclosures, FIA CCP Tracker

Note: LCH LTD and LCH SA data include only initial margin for cleared derivatives



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2.4 Quantifying the Impact on Margin Breaches

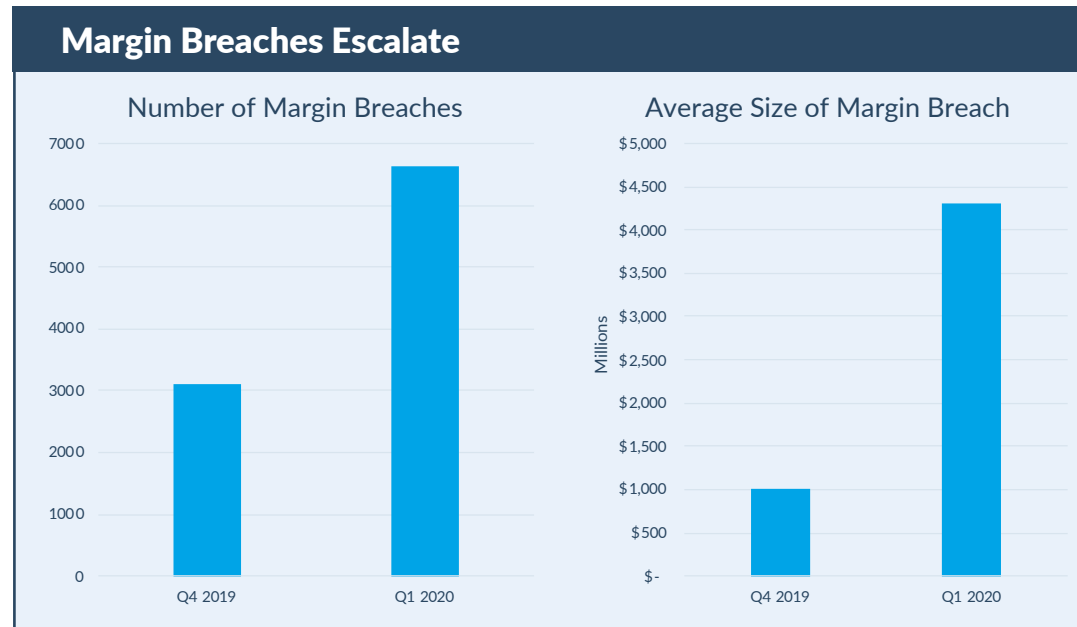
Another important indicator of the level of stress in the clearing system is the frequency and size of margin breaches. In their quarterly quantitative disclosures, CCPs publish data on the number of times over the prior 12 months that the initial margin held against any member account fell below the actual marked-to-market exposure of that account, based on their daily back-testing results. The CCPs also disclose the peak size of the margin breaches during the prior 12 months. Both types of data provide important insights into the calibration of the CCP margin models and the degree to which the CCPs and their members were exposed to shortfalls in margin coverage.

FIA estimates that the number of margin breaches reported by the nine major clearinghouses in the sample group rose from 3,106 during the 12 months ending in the fourth quarter of 2019 to 6,640 in the 12 months ending the first quarter of 2020. In other words, the number of margin breaches that occurred in the first quarter alone was greater than the total for the preceding 12 months.

The peak size of the breaches also increased dramatically during the first quarter. For example, the clearing service provided by Eurex for fixed income derivatives had a peak margin breach of \$733.1 million in the first quarter, almost double the \$371.4 million reported in the fourth quarter. The interest rate clearing service operated by LCH LTD had a peak margin breach of \$695.4 million in the first quarter, versus \$157.9 million in the fourth quarter. The peak margin breach at OCC was \$102.7 million in the first quarter, versus just \$19.1 million in the fourth quarter.

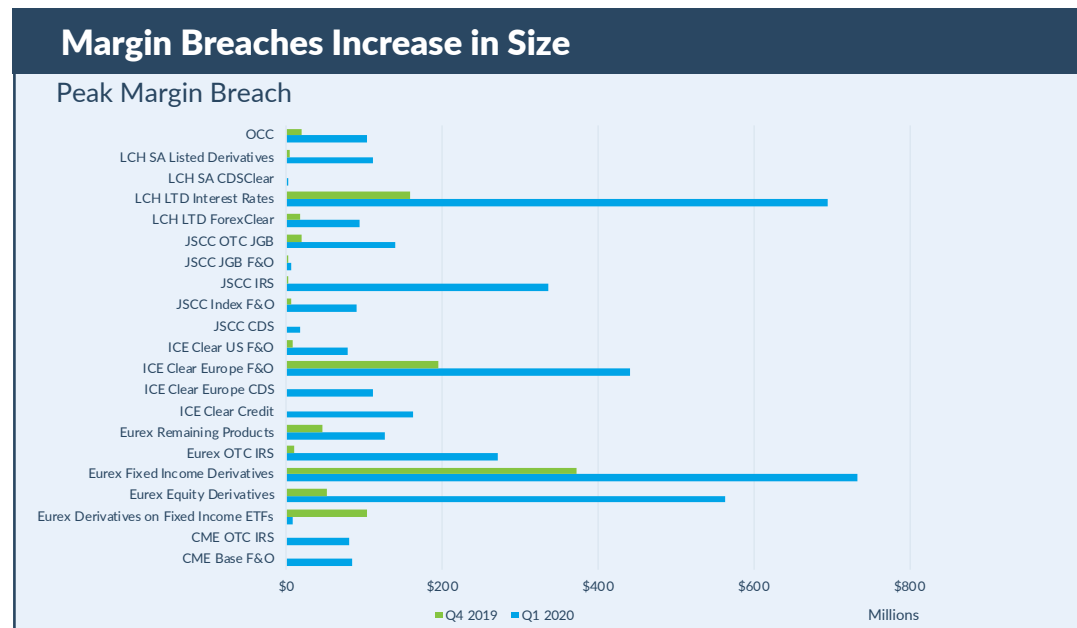


Revisiting Procyclicality: The Impact of the COVID Crisis on CCP Margin Requirements



Source: Public Quantitative Disclosures, FIA CCP Tracker

Note: Based on quarterly disclosures covering clearing services operated by nine CCPs (CME, Eurex, ICE Clear US, ICE Clear Credit, ICE Clear Europe, JSCC, LCH LTD, LCH SA, OCC)



Source: Public Quantitative Disclosures, FIA CCP Tracker

Note: LCH LTD and LCH SA data include only initial margin for cleared derivatives



Revisiting Procyclicality: The Impact of the COVID Crisis on CCP Margin Requirements

The existence of margin breaches does not necessarily indicate that the margin models are flawed. CCPs are required to set a “confidence interval” of greater than 99% for their models, but not 100%. In other words, initial margin should be sufficient to cover most but not all market moves. Initial margin after all is only the first line of defense against a default, and it is not designed to cover all losses in all scenarios.

However, the margin breach data understate the problem because they are based on margin breaches at the member account level. The amounts are calculated based on the margin coverage of all positions held in that member account, which makes it difficult to determine which contracts are the source of the breaches.

To illustrate this issue, FIA analyzed data provided by its members on the margin requirements for a handful of individual contracts and compared those requirements to the actual change in mark-to-market values. Based on this analysis, FIA estimates that in some contracts there was a large jump in the number and size of margin breaches during a short period stretching from late February to mid-March 2020.

For example, marked-to-market exposures for the Emini S&P 500 futures exceeded initial margin five times between February 27 and March 16. The most extreme breach was on March 12, when the one day change in the marked-to-market value of the contract was 62% larger than the amount of coverage provided by initial margin.

This trend was not universal, however. The Nikkei 225 margin coverage was exceeded three times, on February 28, March 9 and March 13, but the amount of the breach peaked at 27%. The marked-to-market exposure on the Euro-Bund futures contract only exceeded margin coverage once, on March 18, and the size of the uncovered exposure was only 3%.

The public quantitative disclosures do not include data on margin breaches at the individual contract level, so it is difficult to determine where margin coverage proved to be the least sufficient during the market turmoil. This is an area where improved disclosures would help policymakers and clearing members better understand the performance of margin models during periods of significant market stress.



PART 3: FIA RECOMMENDATIONS

It is inevitable and expected that CCPs will increase initial margin requirements during periods of market stress. After all, the purpose of initial margin is to cover potential loss, and that estimate should be adjusted dynamically as risks change.

The problem with what happened this year is the size and frequency of the increases. As described above, the sudden jump in initial margin requirements during the spring of 2020 was extremely large and took place within a very short period of time. Although market participants were able to meet these margin calls, clearing members and their customers had to fund the calls when the markets were under high stress. This is exactly the time that such dramatic increases in margin can have the greatest potential to exacerbate stress in the system.

This issue is a top concern for many market participants. FIA conducted a survey of its members in May 2020 and 76% of respondents identified margin volatility and unpredictability as a challenge for their organizations.

It is also a concern for central banks, market regulators, and other members of the supervisory community. A [working paper](#) recently published by the Bank for International Settlements observed that CCP margin calls during March “strained the liquidity positions of large dealer banks” and “exacerbated the liquidity squeeze” that impacted the availability of collateral at that time. The paper recommended that central banks and regulators to consider ways to limit margin increases through mechanisms such as margin floors.

Most clearinghouses already have anti-procyclicality measures in place, as recommended by the CPMI-IOSCO Principles for Financial Market Infrastructures. The spring of 2020 showed that these measures are a good starting point but there must be more meaningful anti-procyclical measures adopted by CCPs.

FIA therefore believes that improvements should be made to initial margin calculations to reduce procyclicality of CCP margin requirements during market stresses. In the rest of this section, FIA outlines two sets of measures that can help address this issue.

FIA also believes this is an appropriate time to review other aspects of margin models that impact the determination of initial margin requirements.

3.1 Recommendations to Limit Procyclicality

CCPs should employ a margin framework that covers the cost of portfolio liquidation across a wide range of market conditions, including changes in volatility, without extreme jumps in margin requirements.

Procyclicality should be defined by way of a standard set of metrics so as to enable CCPs to determine targets to be achieved.

CCPs should adopt appropriate and conservative anti-procyclicality measures, taking into account the specific characteristics of cleared contracts and a lookback period that includes periods of significant market stress, such as the collapse of Lehman in September 2008 and the Brexit referendum in June 2016.

More generally, we believe that the need for anti-procyclicality measures should be understood as part of an overall emphasis on ensuring the resiliency of the clearing system. The more robust a CCP's margin methodology is, the less need there is to rely on specific anti-procyclicality measures.

3.1.1 Margin Floors

The purpose of margin floors is to reduce procyclicality by preventing margin levels from falling to very low levels during benign market conditions. CCPs in general have implemented margin floors based on existing regulatory standards. For example, the European Market Infrastructure Regulation sets out three anti-procyclical controls. Those options, while not directly setting margin floors, are designed to result in higher margins during periods of low volatility.

However, as demonstrated by the extreme margin increases shown above, we believe that the current generation of margin floors are not sufficiently effective and must be strengthened.

EMIR Anti-Procyclicality Controls

The anti-procyclicality controls required under EMIR are the most stringent standards currently in effect. Clearinghouses subject to this regulation are required by Article 28 of the Regulatory Technical Standards to employ at least one of the following options to address procyclicality:

- apply a margin buffer at least equal to 25% of the calculated margins, which can be temporarily exhausted when margin requirements are rising significantly;
- assign at least a 25% weight to stressed observations in the lookback period calculated in accordance with Article 26 of the RTS;
- ensure that its margin requirements are not lower than those that would be calculated using volatility estimated over a 10-year historical lookback period.

These standards now apply to all CCPs doing business in the European Union, including CCPs headquartered outside the EU that provide clearing for members and customers based in the EU. The EU APC standards therefore come the closest to being a global standard.

FIA believes, however, that these standards have not been sufficiently effective for several reasons. For example, some CCPs have employed option “a” as an add-on in all conditions, which means that the 25% margin buffer is not reduced even when margin requirements rise. In the case of option “b”, interpretations of this measure vary across CCPs, and in some cases the calculation method dilutes the effect of the 25% weighting. The weakness of option “c” is that the 10-year lookback period leaves out more distant periods of significant market stress, such as the collapse of Lehman in 2008.

[See ESMA additional guidance on anti-procyclicality controls, which provides further granularity on how these should be applied.](#)

We recognize that a formulaic ‘one-size-fits-all’ approach is unlikely to work for all CCPs and all asset classes. We also recognize the need to strike a sensible balance that avoids setting margin levels too high and unnecessarily discouraging member and customer participation.

We therefore recommend a principles-based approach backed by a requirement that CCPs demonstrate that the floors are indeed meaningful. This approach could include the following three principles:

- **Stress lookback periods** used to calibrate margin floors must be long enough to include periods of significant market stress, such as the 2008 global financial crisis and/or the spring of 2020, as well as being appropriate for the particular asset class. CCPs should justify appropriateness of their stress look-back periods, which may include selecting both a long lookback period and a shorter recent period depending on which produces the higher result.
- **Minimum volatility floors** should be implemented to prevent margin requirements hitting low points during extended periods of low volatility. They must be appropriately calibrated for the contract and asset class.
- Margin amounts should be calibrated based on an analysis of both **absolute and percentage returns** in order to set floors that are adequate in both low and high price regimes.

The overriding principle for calibrating margin floors is that CCPs must demonstrate through back-testing that they are meaningful, i.e., the floor produces a higher margin requirement than the standard margin model during periods of low volatility. Any floor that does not conform to this principle will have no impact on procyclicality and hence must be recalibrated.

3.1.2 Managing the Rate of Change in Margin Requirements

Margin floors can help prevent margin requirements from falling too low during periods of low volatility, but they are of no help in controlling the pace of adjustments to those requirements when volatility returns. As demonstrated during the first quarter of 2020, CCPs quickly responded to changing market conditions and implemented numerous large increases in their margin requirements over a short period of time.

FIA believes the size and speed of these increases put clearing members under extreme pressure and contributed to the liquidity challenges facing the financial system at that time. FIA therefore urges policymakers to consider what measures can be taken to avoid such a rapid increase in margin requirements in the future.

We recommend that CCPs enhance the design of their margin models by measuring the potential for large and sudden increases and using those measurements in the calibration of margin levels. The approach would be to define the risk appetite for the maximum rate of change over a pre-defined

period of time by considering, as an input, the extent of change that would cause significant stress for clearing members and the financial system. The targeted increase in margin should be used to further complement margin floors as an anti-procyclicality control.

The efficacy of the approach should be evaluated through back-testing. A CCP can and should test the procyclicality of its margin model by using historical data from periods of market stress and calculating the maximum change in margin requirements over a short period of time.

Currently CCPs are required to disclose the largest single-day initial margin call across all portfolios during each quarter. This is a step in the right direction, but not sufficient. As we saw during the spring of 2020, margin requirements for certain contracts rose by more than 100% in less than one month. In light of that experience, we recommend that the potential increase in margin requirements should also be measured and reported over one-week, two-week and four-week periods.

We do not recommend, however, a hard limit on the rate of change. Each market is different, and CCPs need the flexibility to adjust margin requirements to match changes in risk. A better approach would be for each clearinghouse to run its own analysis and set its own target for the maximum rate of change, and then disclose that target and the underlying rationale to its regulators and its clearing members. This would have the benefit of clarifying expected maximum amounts of funding required from clearing members during periods of extreme stress, while preserving the ability of CCPs to tailor their margin models to the specific characteristics of each market.

To be clear, CCPs must never be under-collateralized; CCPs should increase margins if market volatility requires margin changes in excess of the targeted levels. However, backtesting the targeted increase over stressed periods would reduce the probability of such changes.

3.1.3 Intraday Margin Calls

Clearing firms recognize the need for CCPs to be able to call for additional funds intraday, rather than waiting until the end of the day, in order to maintain sufficient collateral to cover actual and potential losses. Having the ability to make intraday calls is an important part of the toolset used by CCPs to manage risk exposures on a real-time basis and ensure the resiliency of the clearing system.

But intraday margin calls can intensify funding pressures on clearing members in a procyclical manner. This is particularly true for periods of market stress, not only during the stress event itself but also on an ongoing basis, in the form

of liquidity that must be kept on reserve in case another spike in volatility triggers additional calls. For that reason, FIA believes the use of intraday margin calls should be carefully reviewed as part of the overall effort to reduce procyclicality.

It is important to distinguish between intraday calls that are issued to cover intraday trading losses, and intraday calls that are issued to collect additional initial margin on existing positions. If initial margin models are appropriately calibrated, intraday calls for initial margin should be the exception, not the norm, for existing portfolio risk.

It is also important to distinguish between routine calls to cover intraday price movements and *ad hoc* intraday calls. Both are important tools for CCPs, but *ad hoc* calls put far more pressure on the ability of clearing members to fund the calls. Clearing members generally maintain a certain amount of cash and other collateral on hand to meet their liquidity needs, but the unpredictable nature of *ad hoc* calls makes it more difficult for clearing members to forecast the amount of margin they will need that day and collect collateral from customers before the payment is made.

There are several key points to consider when assessing the impact of intraday calls on the clearing firms' liquidity positions:

- They can be asymmetric; some CCPs call intraday for collateral to cover intraday losses but do not pay out such funds as variation margin on gains.
- They are often unscheduled, making it more difficult for clearing members to anticipate the need to fund the calls and adding to the stress on clearing members during periods of market turmoil.
- Intraday calls, even when scheduled, are not necessarily issued at the same time every day. During periods of market stress and volatility, these calls are often issued late in the day, putting further pressure on clearing members' funding requirements. Furthermore, some CCPs that run multiple intraday calls can collect earlier in the day, but not pay back later in the day if the exposures reduce.
- Clearing members are generally unable to pass intraday calls onto customers, resulting in them having to temporarily fund customer trading losses until positions are fully marked-to-market as part of the end-of-day margin run. In addition, some CCPs do not always allow such funding to be applied against end-of-day requirements, resulting in double funding.
- CCP rules generally grant the CCPs a high degree of flexibility in terms of the amount, frequency and timing of intraday calls while simultaneously

placing stringent terms on the obligations of clearing firms to meet them.

For example, typically these calls must be met in cash and within one hour.

Clearing firms should hold and do hold liquidity buffers to cover intraday calls. However, during the extreme market volatility caused by the Covid-19 crisis, the size and frequency of calls received was much higher than 'business as usual' levels. Firms had to fund *ad hoc* intraday margin calls from multiple CCPs almost simultaneously. This stressed the ability of clearing members to source liquidity within the deadlines set by the CCPs. It also presented operational challenges in managing large calls in multiple currencies simultaneously. These issues can be particularly acute when calls are made late in the day. In extremis this could contribute to procyclical systemic liquidity issues due to interdependencies between CCPs and their clearing members and across CCPs with overlapping membership.

Currently, certain CCPs make multiple intraday calls for gross margin without any netting or return of collateral for gains in customer portfolios. The cumulative impact of these intraday calls during a period of market stress could create serious liquidity issues.

We acknowledge that the ability to make intraday margin calls is necessary for the prudent management of CCP risk. But CCPs should limit the number of times that intraday calls are used for trading losses. This limit should be based on when the unsecured level of risk reaches a certain percentage of the total initial margin collected for a clearing member. In addition in light of the strain that intraday calls can put on liquidity, CCPs should not view intraday calls as replacements or mitigants for appropriate end-of-day margining and appropriately calibrated initial margin models.

We also note that the occurrence of frequent intraday margin calls may indicate that a CCP's margin framework is not performing adequately, or that it has a relatively high tolerance for risk. It is also important to note that there is a dynamic interaction between margin floors and intraday calls. If floors are set higher, they will reduce the need for intraday calls.

For these reasons, we make the following recommendations:

Intraday margin calls should be scheduled and clearly defined to all participants:

- Routine intraday calls should be made at the same time every day.
- CCPs should make intraday calls as early as possible in the business day, and consider setting limits on how late in the day they can be made.
- An intraday call should clearly separate the initial margin and intraday trading loss components of the call.
- CCPs should allow non-cash collateral to cover intraday calls for initial margin.
- Excess securities collateral held at CCPs should be permitted, where law allows, to cover intraday margin calls. Some CCPs only allow the use of excess cash to meet such calls.

Unscheduled or *ad hoc* calls should be available but only in extreme situations :

- *Ad hoc* intraday calls should be necessary only in times of extreme market dislocation or when the CCP has a large, uncovered exposure to a member. Margin calculations should be sufficient to ensure that *ad hoc* intraday calls occur relatively infrequently. Clear limits and thresholds on *ad hoc* intraday calls also should be considered.
- CCPs should provide full transparency for triggers of *ad hoc* intraday margin calls. This will assist clearing participants in actively tracking and monitoring liquidity demands.
- When CCPs offer more than one clearing service, an *ad hoc* intraday call triggered by market conditions affecting one of those services should be charged only to members of that service. For example, when CCPs structure their clearing services by asset class, with each asset class being handled separately from the others. A default in one of these clearing services should be covered by the resources dedicated to that service, and only that service, unless the CCP's rules clearly indicate otherwise.

3.2: Recommendations to Improve Margin Models in General

Although the primary focus of this paper is on limiting procyclicality, FIA believes that general improvements to margin models will dampen procyclical effects. As such, margin models should be examined to ensure resiliency of the clearing system generally. Many of these issues were covered in [previous white papers](#) issued by FIA with recommendations for improving CCP risk management.

Margin requirements should be calculated so that they appropriately capture the characteristics, complexity and liquidity of each product, either as a stand-alone position or as part of a portfolio of positions. CCPs must employ a margin framework that should cover the cost of portfolio liquidation at the indicated confidence level across market conditions (including changes in volatility) without procyclical jumps in margin requirements.

Consultation with clearing members is key to a successful margin framework. There should be proper consultation with clearing members, not just the CCP risk committees, before implementing changes in the margin models. Additionally, clearing members and regulators alike should understand when and why similar products that are cleared by different CCPs have different margin requirements. Clearing members and regulators should understand the rationale for that difference, such as differences in liquidity.

Margin periods of risk (MPOR), look-back periods, confidence intervals, add-ons, offsets and, for customer accounts, whether margin requirements are calculated on a net or gross basis are all factors that make up the margin framework. Although CPMI-IOSCO provides guidance relating to margin, there have been challenges and significant differences in implementation in different jurisdictions leading to different outcomes.

The COVID crisis of 2020 reinforced the importance of work in this area, and in particular we urge policymakers and CCPs to endorse the following principles, which we consider to be essential for a strong margin framework:

3.2.1 Accurate, Robust Pricing

- CCPs must have a robust framework for determining end-of-day settlement price; the framework must cover situations where there has been no trading in the market.
- Rolling over “stale prices” for multiple days is not acceptable.

3.2.2 Margin Period of Risk

- The MPOR should be aligned with the time needed to (i) hedge the delta, (ii) port customer positions to a new clearing member, or (iii) otherwise liquidate the positions in the market (fully closing out the portfolio), either via an auction or the exchange's central order book.
- CCPs should be required to demonstrate to clearing members that they can complete all of these steps within the MPOR they employ, recognizing that information needed to port positions and assets may not be immediately available upon a member's default.
- Porting is a top priority to minimize impact to customers and limit the portfolio which would have to be liquidated to manage a default. Whether net or gross margin is better for porting depends on the account structure and underlying legal regime. While ease of porting would be better achieved under a gross structure, net margining may be more consistent with certain specific legal and regulatory environments. If net margining is adopted, CCPs should incorporate rules to ensure porting can be effectively carried out and minimize potential loss to non-defaulting customers of the defaulted clearing member.
- House account MPOR should not be greater than customer account MPOR, as this is not reflective of longer time to unwind (when accounting for porting windows).

3.2.3 Calibration Scenarios (Lookback Periods)

- Calibrating margin based primarily on very recent data (short lookback periods) has led margins to largely reflect current margin conditions, and thus be highly pro-cyclical.
- Calibrating margin using data from very long lookbacks reduces procyclicality, but will leave the CCP exposed during volatility spikes.
- To reduce procyclicality, but always cover current risk, CCPs should ensure that the scenarios used in margin calibration include stress scenarios. That is, calibration data should cover a highly diverse set of potential market conditions.

- While lookback periods do not have to be uniform across all products, they should be consistent as possible for the same type of product across CCPs. For products where historical data is not available, CCPs should include hypothetical scenarios.
- Similar to the Standard Initial Margin Model (SIMM) used for uncleared derivatives, a stress period for the relevant asset class/products should be included in addition to the standard trailing x-number of days.

3.2.4 Add-Ons, such as Concentration Margin and Liquidity

- CCPs should endeavor to include any margin add-ons in their core margin methodologies so that such add-ons can be understood and anticipated. Clear CCP methodologies for add-ons can allow participants to manage their risk more effectively.
- Add-ons should reflect the product-specific risks, such as liquidity, jump-to-default, wrong way risk, sovereign, and holidays. Add-ons also should reflect the potential for a default in the underlying asset.
- Add-ons should be applied at the portfolio level (including individual client level), rather than the member account level, to maintain a “defaulter pays” approach to risk management.
- Concentration margin add-ons, a type of add-on that is designed to address the risks of liquidating relatively large positions, should be based on a realistic estimate of the likely impact that liquidation would have on the price achieved in the market. Such estimates should be based on position-level analysis and credible data, and for less liquid products, explicit modeling of liquidation costs.
- Concentration add-ons should not be a substitute for inadequate initial margin.
- Given the importance of timely communication when add-ons are applied, the systems used for notifications and alerts should improve from email to more sophisticated systems.

3.2.5 Offsets

- Offsets should require intuitive, strong and reliable economic justification, such as the ability to arbitrage among the positions, not merely statistical correlation, and be well documented.
- Correlation benefits and their underlying economic rationales should be carefully considered, using an appropriate amount of historical and stressed scenarios, taking into account that correlation will exhibit fat tails and are prone to breaking down in stressed periods.
- Diversification benefits across unrelated underlying contracts should not be allowed.
- Margin offsets across products with related underlying should only be granted if the benefits are highly likely to exist in the economic conditions following a member default.
- Diversification benefits may be limited by correlated movements in stressed conditions.



4: CONCLUSION

As discussed above, FIA strongly believes that margin models need to be recalibrated to reduce procyclicality. FIA urges global standard-setters to intensify their work on procyclicality and provide further guidance on this issue in the *Principles for Financial Market Infrastructures*. FIA believes that there are important policy issues at stake in this discussion, and FIA urges market regulators and prudential regulators to work together on this issue. In addition, the policy discussion should include all stakeholders – the CCPs, the clearing members and the customers so that all parties can share their perspectives on the costs, the benefits, and the tradeoffs.

FIA also urges the global standard-setters to continue to enhance transparency into margin models via more precise and/or expanded disclosure standards. The existing standards for quantitative disclosures, which have been in effect since the third quarter of 2015, have provided an important source of information about margin models and other aspects of CCP risk management. Now is the right time to review these standards and determine how they can be enhanced.

More generally, we urge all stakeholders to avoid legacy thinking. The next crisis to face the industry is unlikely to be a replay of 2008. The lesson learned from the “great lockdown” of 2020 is that the margin models are highly procyclical, and this procyclicality has the potential to create a liquidity crisis in the derivatives clearing system. Fortunately, the quick response of the Federal Reserve and other central banks abated the liquidity squeeze in March 2020. We should not wait until the system fails to introduce improvements to the margin models.



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