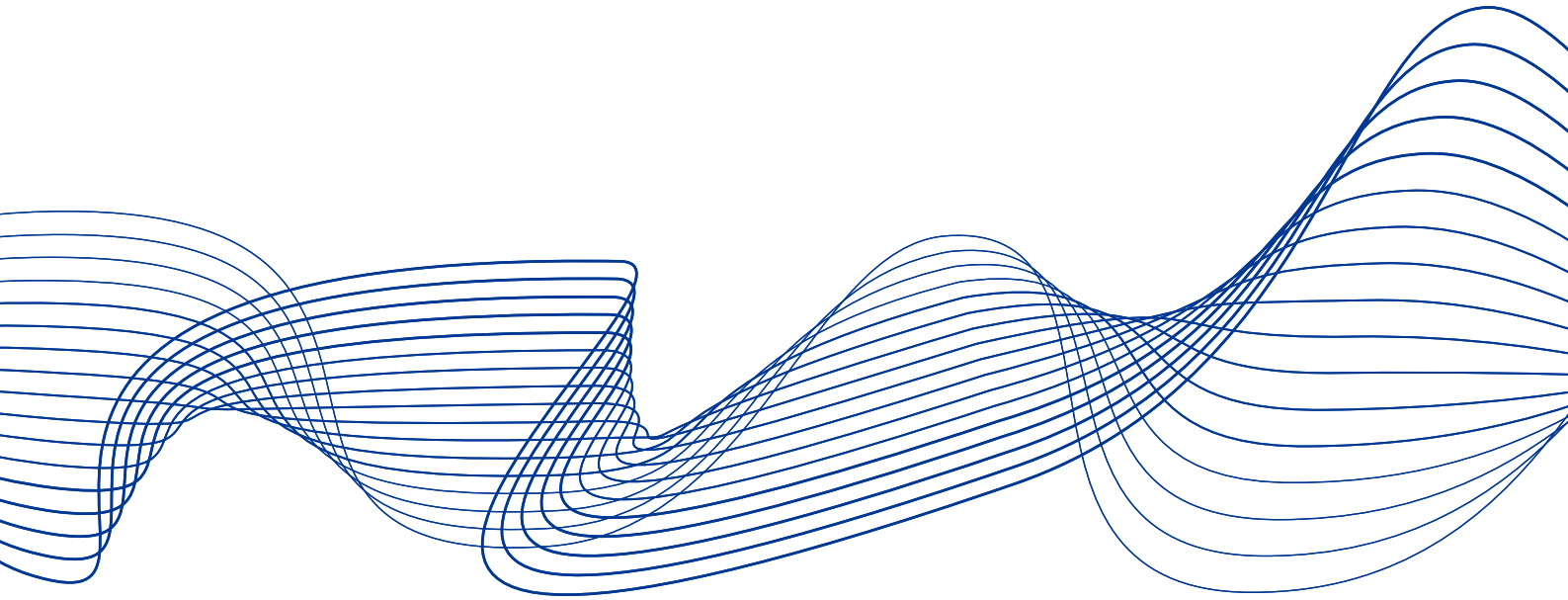
Liquidity risks arising from margin calls

June 2020



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Executive summary

Central clearing and margin requirements in the bilateral sphere bring high benefits to financial stability and more particularly in terms of management of counterparty credit risk. Greater central clearing of derivatives and collateralisation of non-centrally cleared derivatives positions have significantly strengthened the resilience of derivatives markets since the aftermath of the 2008 financial crisis. These reforms – led by the G20/Financial Stability Board – helped to ensure that recent market stress has not resulted in widespread concern about counterparty credit risk. Central clearing also maximises netting opportunities that achieve greater capital and collateral efficiency, including in respect of variation margin payments that mechanically reflect movements in market prices.

The coronavirus crisis and the recent oil market disruption caused a sharp drop in asset prices and increased volatility, resulting among others in significant margin calls across centrally cleared and non-centrally cleared markets. This report documents two financial stability-related issues: (i) large amounts of margins called from mid-February to mid-April, which may further increase due to likely forthcoming credit rating downgrades and possible further market volatility, as well as (ii) the adverse impact of such margin calls on both bank and non-bank entities, also in view of market concentration and interconnectedness.

This report proposes a recommendation addressed to the competent authorities in the area of central counterparties (CCPs), banks and other relevant market participants, encompassing the following aspects:

1. To the extent compatible with the overarching objective of avoiding jeopardizing the resilience of counterparties, limit sudden and significant (hence procyclical) changes and cliff effects in initial margins (including margin add-ons) and in collateral practices: (i) by CCPs vis-à-vis members; and (ii) by clearing members vis-à-vis their clients; as well as (iii) in the bilateral market, resulting from the mechanistic use of external credit ratings and possibly procyclical internal credit scoring methodologies.

2. Include in CCPs liquidity stress testing any two defaulting entities regardless of their role vis-à-vis the CCP, including liquidity providers to the CCP, to enhance the liquidity resilience of CCPs by taking into account risks from the systemic, macroprudential perspective related to the high degree of interconnectedness among CCPs and their liquidity service providers. The policy also proposes to consider conducting coordinated liquidity stress tests at the EU and/or global level.

3. To the extent compatible with CCPs' operational and financial resilience, limit unnecessary liquidity constraints for clearing members and clients related to operational processes for margin collection.

4. Steer discussions at international level, through the participation of relevant competent authorities in international fora and standard setting bodies, where applicable, on means to mitigate the procyclicality in margin and haircut practices when providing client clearing services. These discussions should pursue the feasibility assessment, as well as the design

and set up of global standards governing minimum requirements for risk management when providing client clearing services – both centrally cleared and non-centrally cleared.

The report also proposes further policies to be considered and analyses to be carried out over the short to medium term within the ESRB's structures. Notably, the ESRB could:

1. Recommend to the European Commission to consider the possibility of amending Level 1 or Level 2 regulation in order to require CCPs to implement an accelerated pass-through of intraday variation margins, whenever operationally possible and wherever the risk management framework would not be negatively impacted.

2. Independently assess the antiprocyclicality performance of the International Swaps and Derivatives Association (ISDA) SIMM model[1] used widely for calibrating margin exchanges in bilateral derivatives transactions.

3. Analyse the structure of the clearing market in Europe from a financial stability perspective and its resilience in times of stress, focusing on interconnectedness and concentration in the provision of clearing services by CCPs and clearing members (also in view of increased market activity). If needed, recommend adjustments to prudential requirements for managing concentration risk at the CCP and clearing member level. In this regard, due consideration should be given to the existing global standards developed by the Basel Committee on Banking Supervision (BCBS), the committee of Payments and market infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) in order to ensure a regulatory level playing field with other major jurisdictions.

4. Promote the continued sharing of relevant information by authorities, within their mandate and respecting confidentiality, and jointly develop analytical tools to enhance the ESRB analytical toolkit.

Finally, this report conveys the message that CCPs limit dividend payments to shareholders and earnings distributions to parent companies, or take equivalent action to build up their own funds. This would help ensure that CCPs maintain adequate prefunded own resources, in addition to initial margins and default funds, not least in view of increased operational risks.

[1] The ISDA Standard Initial Margin Model (SIMM) is an industry-led standardised methodology for calculating initial margin requirements for non-centrally cleared OTC derivatives.

1 Key issues identified

Central clearing and margin requirements in the bilateral sphere bring high benefits to financial stability and more particularly in terms of management of counterparty credit risk. Greater central clearing of derivatives and collateralisation of non-centrally cleared derivatives positions have significantly strengthened the resilience of derivatives markets since the aftermath of the 2008 financial crisis. These reforms – led by the G20/Financial Stability Board – helped to ensure that recent market stress has not resulted in widespread concern about counterparty credit risk. Central clearing also maximises netting opportunities that achieve greater capital and collateral efficiency, including in respect of variation margin payments that mechanically reflect movements in market prices.

This report considers the implications of significant margin calls from cash and derivative positions across the financial system. As the COVID-19 and oil market crisis caused a sharp drop in asset prices and high levels of market volatility, these developments also resulted in a significant increase in margin calls from cash and derivative positions.[2] Going forward, these could have major implications for the liquidity management and funding needs of counterparties, and possibly even their solvency in a scenario where liquidity stress leads to systematic fire sales of assets. This report considers the implications for the financial system, in particular focusing on financial stability risks that could emerge from large margin calls and how these risks could be mitigated. The report acknowledges that central clearing and margin requirements in the bilateral sphere bring high benefits to financial stability and that policy action on margins must not jeopardise protection against counterparty credit risk. Derivatives counterparties, including CCP clearing members and their clients, should ensure they maintain sufficient liquidity to meet margin calls in timely fashion. It is though also beneficial, from a financial stability perspective, to ensure that CCPs' risk management decisions do not overburden clearing members, their clients and counterparties because of excessively procyclical features, thus creating unwelcome liquidity strains, possibly developing into solvency issues.

Recent episodes of high market volatility have led to a substantial increase in margins. Margin increases have taken place through several channels embedded in the risk management framework of CCPs (serving the derivative and cash markets) and bilateral OTC derivatives: (i) initial margin (collateral covering potential future portfolio losses originating from the default of the counterparty); (ii) variation margin (payments to settle the mark-to-market moves on open positions); and (iii) intraday margin calls (which cover both mark-to-market moves and the recalibration of initial margins on account of heightened volatility, leading to greater potential future losses). In particular, from mid-February to mid-April, initial margins have increased in the wake of higher transaction volumes, but also because of the response of margin models to higher potential future losses due to higher market volatility and tail risks.[3] For example, for the cleared segment of derivative transactions, the total initial margin posted by EU clearing members at the four largest

[2] Data in this report rely on EMIR data and thus relate to derivatives transactions. However, anecdotal evidence shows that FX swap and cash market segments, such as equities, have behaved in a similar fashion.

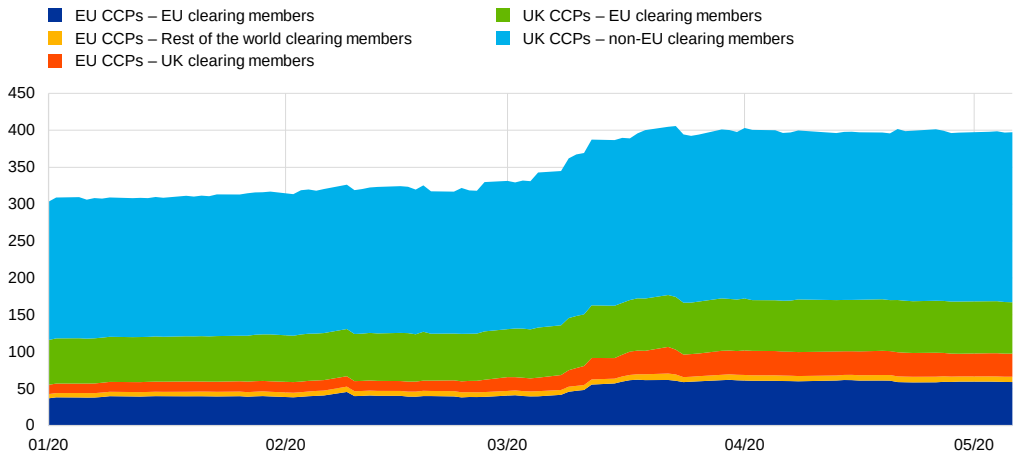
[3] For further details on margining types and factors behind recent margin increases, see item B.1 in Annex B.

CCPs in the EU and in the United Kingdom had increased by ca. €34 billion by the end of March,[4] i.e. by more than one-third of the pre-crisis level (see Chart 1, as well as Charts A.1 and A.2 in Annex A). Margins are fundamental to how a CCP manages counterparty credit risk and are an integral part of the risk management of counterparties and support systemic resilience.

Chart 1

Initial margins posted in EU and UK CCPs by area of the CCP and the clearing member

(EUR billions)



Sources: European Systemic Risk Board trade repository data[5] and ESRB Secretariat calculations based on joint work with the ECB.
Note: The chart includes data for the largest four CCPs (in terms of initial margins) in the EU and the United Kingdom vis-à-vis their respective clearing members. The latest observation is for 7 May 2020.

Since the outbreak of the COVID-19 pandemic, CCPs have called large amounts of intraday margin to cover market movements, with the corresponding variation margin payout often occurring only the next morning, causing liquidity to be temporarily trapped on the accounts of the CCPs. As highlighted by the ESRB [6], in some markets CCPs call and collect intraday margins to cover market movements from loss-making positions together with margin to cover potential exposures on existing and newly novated positions. As a result, while clearing members with loss-making positions provide margin to the CCPs to cover this exposure, clearing members with profit-making positions do not receive the corresponding variation margin payout until the next day, resulting in the liquidity being held at CCPs overnight during times when it could be most needed in other areas of the system. During recent weeks, the total amounts of variation margins have increased substantially (see Chart 2). For one country, the trading data have been cross-checked with supervisory data on the CCP's intraday margin calls, which showed that intraday

4 Overall, in the cleared segment of derivatives transactions, initial margins at the four largest CCPs in the EU and in the United Kingdom increased from ca. €300 billion to ca. €400 billion between January 2020 and end-March 2020. This refers to the total across all clearing members at any of the four CCPs, including legal entities outside the EU. Of this, €34 billion was called from EU clearing members, with a surge of €28 billion (80%) in March alone.

5 Trade repository data (or EMIR data) refers to the data accessed by the European Systemic Risk Board based on the European Market Infrastructure Regulation (EMIR).

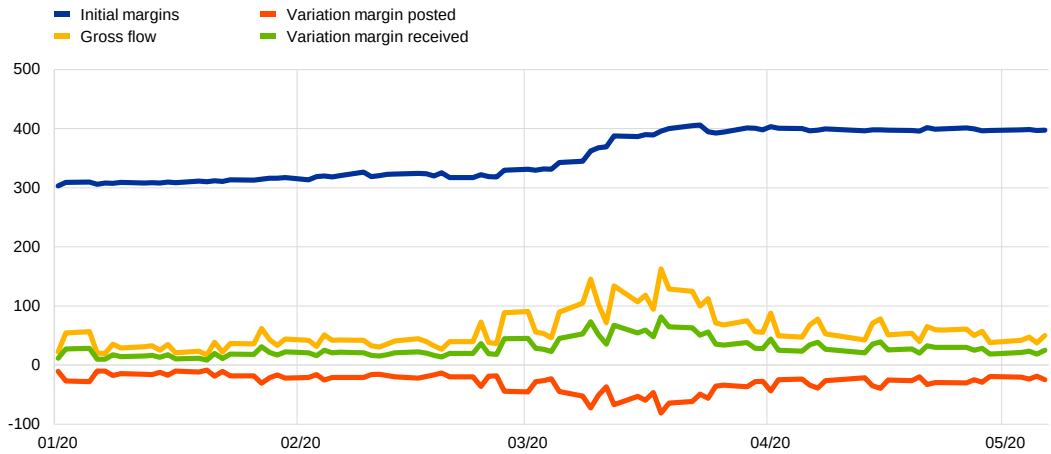
6 European Systemic Risk Board (2020b), **Mitigating the procyclicality of margins and haircuts in derivatives markets and securities financing transactions**, January 2020.

margin calls mainly resulted from market movements (i.e. variation margins) on days of high volatility, and that variation margin gains were not paid out intraday but on the following morning. Currently intraday margin calls are not passed on in many CCPs for several reasons, e.g. because these calls cover both mark-to-market changes and top-ups for initial margins on an intraday basis, or because some CCPs accept non-cash collateral for meeting intraday margin calls, which would make it challenging to pass on the same day.

Chart 2

Initial and variation margins posted in four EU and UK CCPs

(EUR billions)



Sources: European Systemic Risk Board EMIR data. ESRB Secretariat calculations based on joint work with the ECB.
Note: The chart includes data for the largest four CCPs (in terms of initial margins) in the EU and United Kingdom vis-à-vis their respective clearing members. The latest observation is for 7 May 2020. The chart shows a comparison of initial and variation margins posted and received at the four largest CCPs in the EU and the United Kingdom by initial margins (clearing members from all jurisdictions are included in the aggregates). Gross flows proxies the total amount of liquidity flowing from clearing members to the CCPs plus the amount from the CCPs to the clearing members until the end of the day. Variation margin received by the CCPs proxies the amount of clearing members' cash liquidity needs. Variation margin posted by the CCPs proxies the amount of cash liquidity received by clearing members. The share of variation margin posted by the CCPs resulting from intraday margin calls reflects the liquidity subject to a delayed pass-through for some CCPs. The results for each CCP have been validated with national sources. The methodology has been developed in cooperation with the Deutsche Bundesbank.

Margin frameworks have responded broadly as expected so far, reflecting the smooth functioning of cleared and bilateral markets and timely payouts by market participants.[7] Market participants have met margin calls in centrally cleared markets with only minor operational delays in some cases, which they promptly solved without putting counterparties at risk. In the bilateral market, the number of disputes has markedly increased, but total amounts have remained stable. Clearing members have also continued to post high levels of excess collateral at CCPs, which could be interpreted as a precaution against future margin calls or, possibly, as a sign that market participants have not so far faced widespread difficulties in sourcing collateral.

[7] See also some evidence on the functioning of the repo market in item B.2 in Annex B.

Some banking entities have seen a particularly marked increase in initial margins and may have experienced increased liquidity constraints (see Chart 3 and Table A.4 in Annex A), in terms of cash and collateral available. Such strains could be problematic, should the situation materially worsen, in view of the high concentration and interconnectedness of the derivatives markets among several large clearing members.[8] However, capital and liquidity requirements are relatively favourable for derivative positions (see also Table A.5 in Annex A) and major banks under the Single Supervisory Mechanism (SSM) have entered this crisis with robust capital and liquidity positions. In addition, authorities have introduced substantial policy support measures to alleviate potential liquidity and solvency strains and have incentivised banks to make prompt use of their buffers. Overall, so far major European clearing members have not reported any significant delays in meeting margin calls. Currently, major euro area clearing members exceed regulatory liquidity requirements, and they now also have access to additional liquidity support (e.g. through the temporary easing of the ECB's collateral requirements), so that they can be expected to have sufficient balance sheet space to support client needs if necessary.

Margin calls have likely affected non-bank entities significantly, in bilateral markets or via client clearing, due to liquidity constraints.[9] According to recent ECB analysis[10], the daily variation margin calls on euro area investment funds' derivative exposures quintupled. For a substantial share of funds with derivative exposures, the variation margin call exceeded their pre-crisis cash positions on at least one day during the turmoil. In addition, 6% of funds did not have a sufficiently large pre-stress liquidity position to cover the cumulative increase in variation margin during the market turmoil.[11] Furthermore, increases in initial margins posted at CCPs during March 2020 stemmed mainly from client portfolios and to a somewhat lesser extent from house portfolios (due to comparatively limited house business).[12] Such developments may be of concern given that most non-banks rely on the services of only one client clearing provider[13] and do not have back-up arrangements in place. Therefore, clearing providers typically have extensive discretion to change clearing conditions for their clients in a short period of time, including changes in initial margin calibrations as well as collateral eligibility. As discussed by the ESRB[14], current client clearing arrangements leave clearing members substantial leeway for counterparty-specific add-ons on initial margins (of up to 50%). While clearing service providers' collateral requirements are typically aligned with those of CCPs, clearing providers' repo desks typically offer (but are not contractually

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8 See also the evidence on interconnectedness and concentration in Figures A.1 and A.2 and Tables A.1-A.3 in Annex A.

9 For a more detailed discussion and further evidence on the concentration of client clearing, the impact on non-bank financial entities and non-financial corporations, as well as on the functioning of the bilaterally cleared FX market, see items B.3-B.5 in Annex B.

10 See Charts A.3-A.5 in Annex A and Fache Rousová, L., Gravanis, M., Jukonis, A. and Letizia, E. (2020), "**Derivatives-related liquidity risk facing investment funds**", European Central Bank Financial Stability Review, Special Feature B, May 2020.

11 For further evidence of possible liquidity constraints in non-bank financial entities, see de Jong, A., Draghiciu, A., Fache Rousová, L., Fontana, A. and Letitia, E. (2019), **Impact of variation margining on insurers' liquidity: An analysis of interest rate swap positions**, EIOPA, 2019, as well as Danmarks Nationalbank (2019), "**Pension companies will have large liquidity needs if interest rates rise**", November 2019.

12 See evidence in Chart A.2 in Annex A. House portfolios mean clearing members' own portfolios, as opposed to the portfolios of clearing members' clients.

13 See also evidence in Table A.3 and Figure A.2 in Annex A.

14 European Systemic Risk Board (2020b), **Mitigating the procyclicality of margins and haircuts in derivatives markets and securities financing transactions**, January 2020.

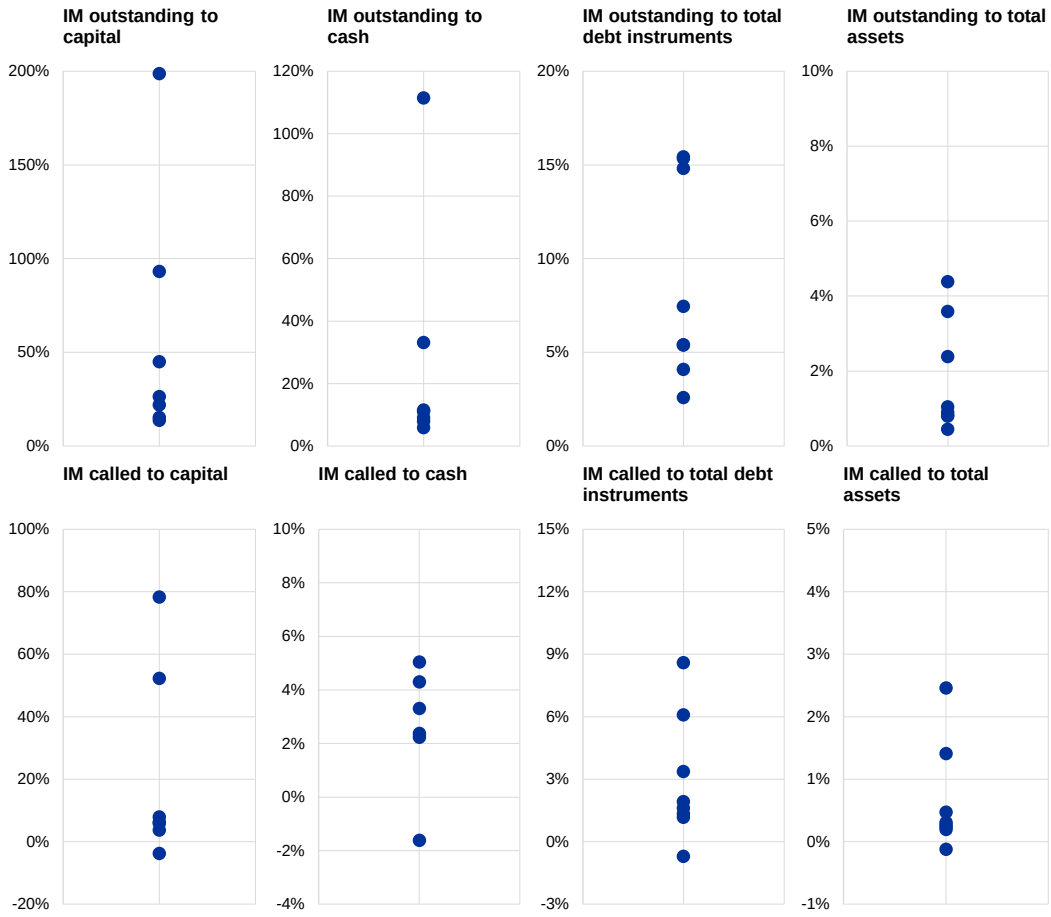
obliged to provide) collateral transformation services to their clients, which increases client dependency on the clearing provider.

Going forward, the ability of market participants to meet margin calls will depend on future levels of volatility and the ongoing resilience of their liquidity management (although solvency risks cannot be excluded). Other important potential channels of liquidity strains include measures taken by CCPs to mitigate credit risk stemming from collateral issuers or clearing members.[15] So far, there is only anecdotal evidence that some CCPs have taken action in this regard. However, CCPs' risk management practices may still reflect downgrades by credit rating agencies (either of collateral issuers or of counterparties), which are also likely to materialise in the future weeks and months. Any downgrade-related changes which are directly reflected in the collateral or counterparty policies might imply that counterparties need to post or substitute large amounts of collateral at short notice (e.g. where a measure affects domestic government bonds which are frequently used as collateral), or even result in them being excluded from both clearing facilities and the bilateral segment of the market. Overall, concentration at CCPs and clearing members and interconnectedness among CCPs through common clearing members, liquidity providers, custodians or investment counterparts may also lead to further cascade effects.

[15] For further background, see items B.6-B.7 in Annex B.

Chart 3

Initial margins (IM) posted as at the end of March and called during Q1 2020 for several European banks relative to their capital, cash holdings, debt securities holdings and total assets



Sources: European Systemic Risk Board EMIR data, SNL and the ESRB Secretariat's calculations.
Notes: The charts present the amount of initial margin outstanding at EU and UK CCPs for several European banks with relatively high initial margins at the end of March 2020 (upper panel) and initial margin called in Q1 2020, as a ratio of CET1 (SNL Table 220292), cash holdings of these banks, defined as cash and balances with central banks (SNL Table 246025), debt securities holdings (SNL Table 224927) and total assets (SNL Table 132264) as at the end of 2019. Banks are presented on an anonymised basis for confidentiality reasons. For one bank, the values of margin called relative to cash (ca. 62%) are not shown in the scatter plot for presentational reasons.

2 Policies to mitigate risks to financial stability

In view of the identified financial stability risks that could emerge from large margin calls, the report proposes that the European Systemic Risk Board should immediately advocate four policies which could be implemented through one recommendation to the relevant Competent Authorities (in the areas of CCPs', banking and other financial market participants). To the extent possible, EU authorities should also promote these policies in international fora, as they may affect EU market participants active in other jurisdictions and to promote a level playing field across the clearing network at global level.

Policy 1. To the extent compatible with the financial resilience of counterparties, limit sudden and significant (hence procyclical) changes and cliff effects in initial margins (including margin add-ons) and in collateral framework: (i) by CCPs vis à vis members; and (ii) by clearing members vis-à-vis their clients; as well as (iii) in the bilateral market, resulting notably from the mechanistic use of external credit ratings and possibly procyclical internal credit scoring methodologies.

The ESRB recommends that national competent authorities (NCAs) of the CCPs:

1. ensure that CCPs' issuer and counterparty credit risk management frameworks (a) use progressive and granular steps, in particular when implementing ratings downgrades, without unduly delaying the feeding of these downgrades in their overall risk management practices and (b) limit procyclical features in internal models, including by considering appropriate margins of conservatism;

2. inform authorities represented in the respective EMIR College, when (and to the extent it does not interfere with the timely implementation of risk management decisions, before) CCPs implement a reduction in the scope of eligible collateral, or any material increase in collateral "haircuts", or any decrease in the concentration limits on the amount of collateral accepted from a single issuer;

3. engage with CCPs (and possibly intermediaries for non-centrally cleared trades) to thoroughly analyse the antiprocyclicality performance of the tools they have used during the most acute periods of stress, and report on these analyses to their supervisory authorities.

Purpose: Limiting sudden and significant (hence procyclical) changes and cliff effects both in the initial margin framework (including margin add-ons) and collateral framework would aim at reducing sharp increases in initial margin requirements and consequently collateral demand. This in turn would alleviate funding pressures for clearing members and clients. When considering margin increases by CCPs, EMIR already addresses the need to maintain antiprocyclicality tools in order to limit procyclicality. Nevertheless, management of (issuer and counterparty) credit risk can also have harmful procyclical effects and lead to liquidity strains. These result from: (i) the use of credit rating agency (CRA) ratings, as downgrades can lead to automatic procyclicality; (ii) internal CCP haircut models and credit scoring methodologies. This is not addressed by EMIR. Concerning the initial margins applied by clearing members to their clients, the current market practice, especially

in equity and listed derivative clearing, is that clearing members increase collateral requirements and collateral haircuts vis-à-vis their clients more than proportionally (by a multiple of more than one) compared with what the CCP actually requires of them for their clients positions. This conservative approach might vary according to: (i) the type of counterparty; as well as (ii) the credit quality of counterparts. This might amplify liquidity drains for CCP end-users. Currently, there is no provision in international standards setting minimum requirements regarding the risk management practices between clearing members and their clients. Therefore there is no provision in the EU framework in this regard, nor does the framework require clearing members to enforce antiprocyclical margin management practices. While the amendments known as the "EMIR Refit" enhance the transparency around margin setting between CCPs and clearing members, the same transparency does not yet extend sufficiently to the relationship between clearing members and their clients, in the absence of an international standard in this regard. Counterparties and in particular CCPs should apply this recommendation in a way which is compatible with their ongoing financial resilience.

Policy 2. Include in CCPs liquidity stress testing any two defaulting entities regardless of their role vis-à-vis a CCP, including liquidity providers to the CCP, to enhance the liquidity resilience of CCPs by taking into account risks from the systemic and macroprudential perspective related to the high degree of interconnectedness among CCPs and their liquidity service providers. The policy also proposes to consider conducting coordinated liquidity stress tests at the EU or global level.

The ESRB recommends that the European Securities and Markets Authority (ESMA) review its draft technical standards under Article 44(2) of Regulation (EU) No 648/2012 so that CCPs include in their liquidity stress test the default of any two entities providing services to a CCP that could affect its liquidity situation. Currently they limit their framework to the default of any two clearing members, as put forward by ESMA in the liquidity stress testing exercise in 2019. For example, the default of any entity acting as an investment and repo counterparty, payment agent, custodian or liquidity provider should be envisaged when selecting the two defaulting entities with the largest impact on the liquidity position of the CCP, even if they are not a clearing member. Any existing back-up arrangement would be taken into account. This will improve the overall market resilience, in view of a large degree of concentration and interconnection among CCPs and their liquidity service providers and, consequently, the fact that prudent liquidity management at individual CCP level might not necessarily cover the risks from the systemic, macroprudential, perspective.

Pending the action taken by ESMA to comply with the above mentioned recommendation and the possible introduction of corresponding EU legislation, it is recommended that competent authorities ensure that the stress scenarios under Article 44 of Regulation (EU) No 648/2012 include the default of any two entities that provide services to the CCP and whose default could materially affect the liquidity position of the CCP. NCAs should encourage CCPs to react to any identified weakness as a result of this enhanced stress test in a way that does not create additional burdens on its members. For example, this could mean encouraging a CCP to find additional liquid resources, but not imposing further limits on the collateral eligibility.

Considering the large concentration in the provision of liquidity services, as well as global interconnections between CCPs and liquidity service providers, competent authorities should engage with CCPs – and to the extent possible with other relevant authorities in third countries – to

conduct coordinated liquidity stress test exercises. These should include the default of any two entities that provide liquidity services to CCPs and whose default could materially affect the liquidity positions of CCPs. This coordinated exercise could take place at the EU level or at a global level.

Purpose: In their liquidity stress testing CCPs should capture comprehensively all the events that may cause them to face a liquidity shortfall.[16] This would incentivise CCPs to mitigate their reliance on a liquidity provider. Since there is a significant degree of concentration in the provision of liquidity and payment services to CCPs, this would enhance overall stability at market infrastructure level. The conduct of coordinated liquidity stress test exercises globally or at the EU level could also increase resilience in the liquidity risk management frameworks of CCPs in the EU.

Policy 3. To the extent compatible with CCPs' operational and financial resilience, limit unnecessary liquidity constraints for clearing members and clients related to operational processes for margin collection

The ESRB recommends that NCAs encourage CCPs to the extent legally possible to ensure that their operational (either variation or initial) margining frameworks (including schedules) do not lead to unsurmountable operational liquidity constraints that may crystallise in default events. This could in particular be achieved by:

1. Where operationally possible and to the extent that it does not materially affect the capacity of the member to use it for the novation of new transactions, CCPs should consider the possibility of offsetting excess collateral against intraday margin calls.

2. Where operationally and legally possible, provided that the risk management framework is not negatively impacted and the capacity of the CCPs to manage their intraday margins and settlements flows is not materially affected, CCPs should identify separately:

   (a) intraday margins covering potential exposures, including exposures due to positions entered into and novated on that day;

   (b) intraday margins covering realised exposures due to market movements on that day, which CCPs should consider paying out to clearing members whose positions have positive mark-to-market values as soon as possible, and possibly on the same settlement day.

Purpose: To the extent operationally and legally feasible, and compatible with their risk management frameworks, CCPs should seek to ensure that their operational processes for the collection of margins are predictable, transparent and limit liquidity strains in the financial system. Limiting the liquidity trapped in CCPs would involve encouraging CCPs to the extent legally possible to limit the asymmetry embedded in the current operational clearing framework. Currently, most CCPs call intraday margins covering both potential future exposures and negative mark-to-market adjustments, and positive mark-to-market adjustments are passed to members only at the end of the day or even the next day. This CCP practice could give rise to cash constraints for clearing members, as well as potential liquidity drains for their clients. However, CCPs would need

[16] This builds up on an **Opinion published by ESMA**.

to consider the suitability of this policy for their operational processes, accounting processes and risk management framework and the impact on their clearing members. In some markets, intraday prices are not fully transparent and intraday margin calls are based on proxies and collected in non-cash.

Policy 4. Recommend to competent authorities to engage in discussions at international level, through their participation in international fora and standard setters bodies, on means to mitigate the procyclicality in margin and haircut practices when providing client clearing services. These discussions should pursue the feasibility assessment, as well as the design and set up of global standards governing minimum requirements for risk management when providing client clearing services – both centrally cleared and non-centrally cleared.

Purpose: The legal framework governing the provision of clearing services in relation to all derivative and cash contracts and for non-cleared repo contracts should aim at explicitly mitigating the procyclicality in margin and "haircut" practices. This would aim at making liquidity planning as predictable and manageable as possible by reducing unexpected and significant cash calls, and providing reasonable and enforceable notice periods for any changes in the initial margin and haircut protocols to ensure that markets participants can adapt smoothly. Discussions should be engaged in the relevant standard setting bodies in order to consider the design and set up of global standards in this regard. This should be pursuant to already existing provisions in regulatory technical standards for risk-mitigation techniques for OTC derivative contracts not cleared by a central counterparty.

The report also proposes further policies to be considered and analyses to be carried out over the short to medium term within the ESRB's structures. Notably, the ESRB could:

1. Recommend that the European Commission considers the possibility of amending Level 1 or Level 2 regulation in order to require CCPs to implement pass-through of intraday variation margins, whenever operationally and legally possible and, provided that the risk management framework is not negatively impacted, and to the extent it does not materially affect the financial resilience of the CCPs.

2. Independently assess the antiprocyclicality performance of the ISDA SIMM model used widely for calibrating margin exchanges in bilateral derivatives transactions.

3. Analyse the structure of the clearing market in Europe from a financial stability perspective and its resilience in times of stress, focusing on interconnectedness and concentration in the provision of clearing services by CCPs and clearing members (also in view of increased market activity).If needed recommend adjustments to prudential requirements for managing concentration risk at the CCP and clearing member level. In this regard, due consideration should be given to the existing global standards developed by the Basel Committee on Banking Supervision (BCBS) and the International Organization of Securities Commissions (IOSCO) in order to ensure a regulatory level playing field with other major jurisdictions.

4. Promote the continued sharing of relevant information by authorities, within their mandate and respecting confidentiality, and jointly develop analytical tools to enhance the ESRB analytical toolkit.

Finally, this report conveys the message that CCPs limit dividend payments to shareholders and earnings distributions to parent companies, or take equivalent action to build up their own funds. This would help ensure that CCPs maintain adequate prefunded own resources in addition to initial margins and default funds, not least in view of operational risks.

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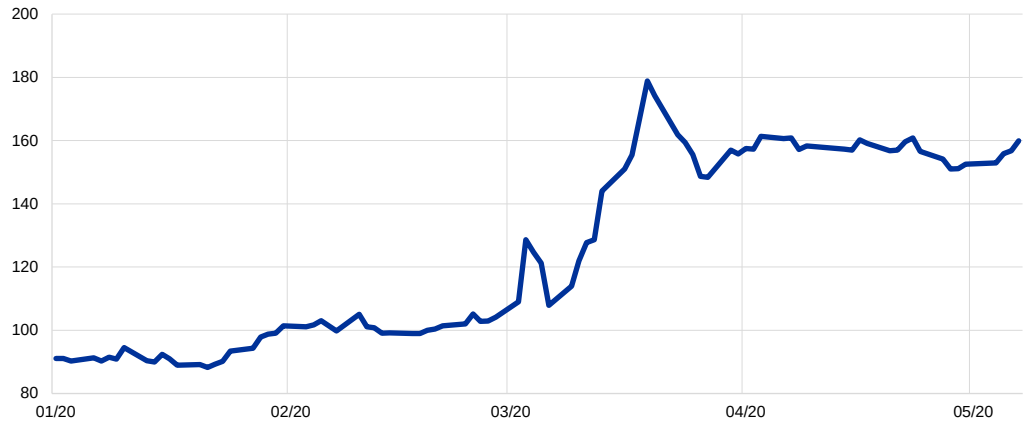
Annex A: Background charts

Chart A.1

Initial margins posted in European CCPs by German market participants

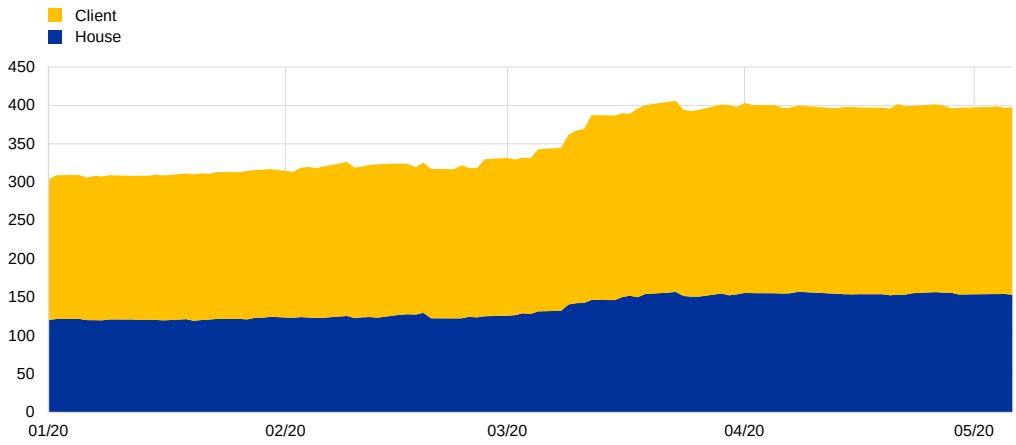
(19 February 2020 = 100)



Sources: EMIR data and Deutsche Bundesbank calculations.
Notes: The chart presents an equally weighted average of initial margin index (19 February 2020 = 100) across six CCPs, as based on the initial margins pledged by German market participants to the CCPs. 19 February 2020 represents the date of the pre-crisis peak for various equity indices (e.g. EURO STOXX 50, DAX, S&P 500) before the coronavirus (COVID-19) crisis. The latest observation is for 7 May 2020.

Chart A.2

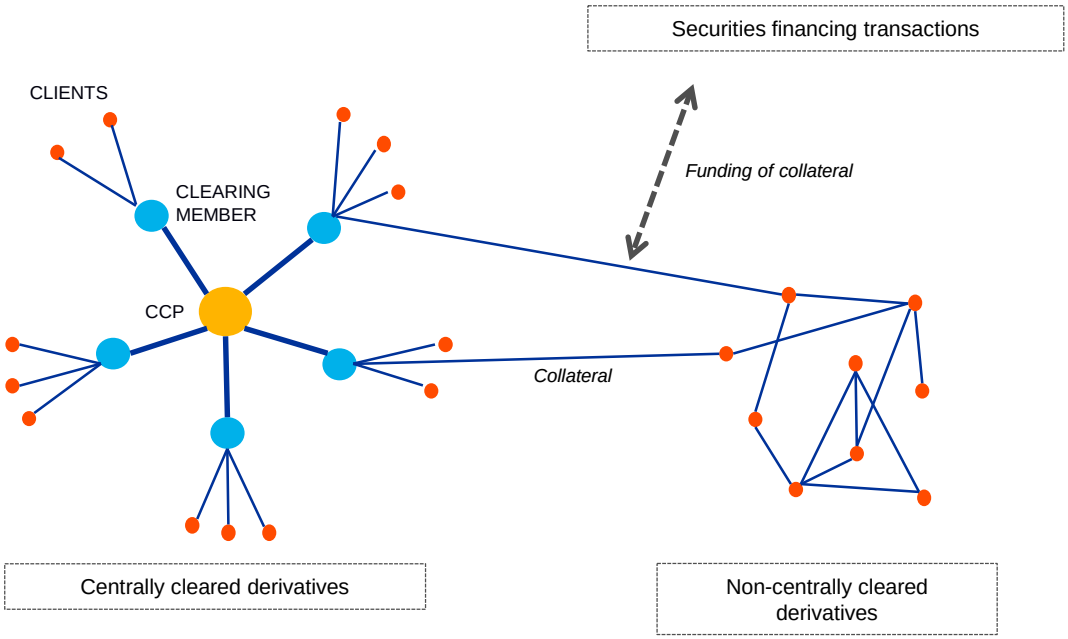
Initial margins posted by house and client accounts



Sources: European Systemic Risk Board EMIR data and ESRB Secretariat calculations based on joint work with ECB.
Note: The chart includes data for the largest four CCPs (in terms of initial margins) in the EU and United Kingdom vis-à-vis their respective clearing members. The fraction of client initial margins is an upper bound estimate produced by combining CCP data from the Public Quantitative Disclosure framework for Central Counterparties and (where available) EMIR data. The latest observation is for 7 May 2020.

Figure A.1

Schematic overview of margining in derivative markets



Source: European Systemic Risk Board.
Note: The chart presents a schematic overview of margining interdependencies in the cleared and bilateral derivatives markets.

Table A.1

Interconnectedness among CCPs: number of common clearing members (CMs) on 30 March 2020

	LCH Ltd	Eurex Clearing AG	ICE Clear Europe	LCH SA
LCH Ltd	127	60	57	41
Eurex Clearing AG	60	127	42	45
ICE Clear Europe	57	42	91	35
LCH SA	41	45	35	53

Sources: European Systemic Risk Board EMIR data and ESRB Secretariat calculations based on joint work with the ECB.
Note: Number of CMs in common where the higher the number the darker the shade of blue.

Table A.2

Concentration of initial margins posted to EU and UK CCPs on 30 March 2020

Number of CMs	Percentage of IM posted
Top 5	20.41%
Top 10	35.03%
Top 15	46.43%
Top 20	55.98%
Top 30	69.95%
Top 50	83.97%
Top 100	96.21%

Sources: European Systemic Risk Board EMIR data and ESRB Secretariat calculations based on joint work with the ECB.
Note: The top four EU and UK CCPs by initial margins are included in the sample, with a total of 230 clearing members.

Table A.3

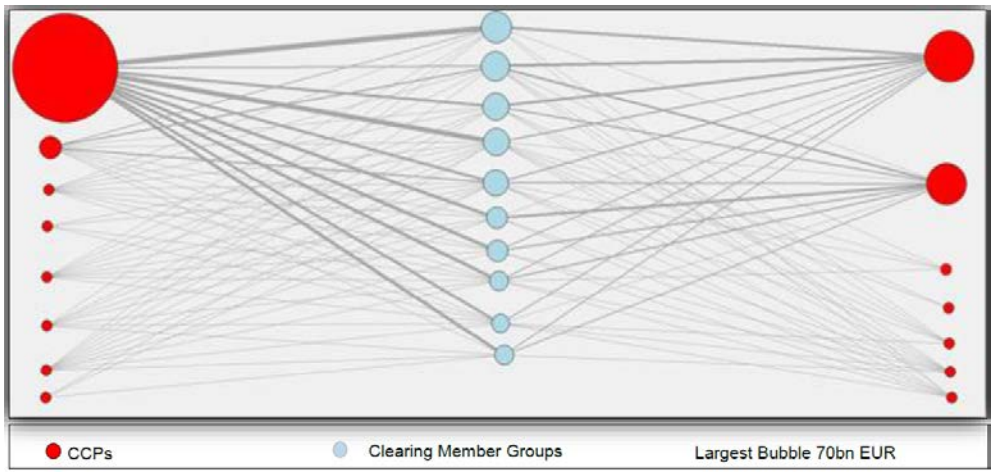
Number of clearing members active in several asset classes

	Interest rates	Credit	Currency	Equity	Commodities
Interest rates	189	32	32	92	59
Credit		32	17	25	20
Currency			38	25	21
Equity				708	50
Commodities					245

Sources: European Systemic Risk Board, EMIR data and ESRB Secretariat calculations.
Notes: The table shows the number of clearing members that are simultaneously active in combinations of derivative classes. Data are as of May 2019. See El-Omari, Y., Fiedor, P., Lapschies, S., Schaanning, E., Seidel, M. and Vacirca, F. (2020), "Interdependencies in central clearing in the EU derivatives market", European Systemic Risk Board Occasional Paper, forthcoming.

Figure A.2

Network of top 10 clearing member groups by default fund contributions and margins



*Source: European Securities and Markets Authority (2018), **EU-Wide CCP Stress Test 2017**, February 2018, Figure 22.*
Note: The results of the more recent stress test are currently under production.

Table A.4

Margins posted to CCP and available collateral of euro area (EA) banks

(EUR billions)

	EA	DE	FR	IT	ES
Initial Margins posted to EU and UK CCPs by					
EA clearing member banks					
03/01/2020	95.58	38.363	33.792	8.613*	
26/03/2020	125.058	55.039	38.934	13.389*	
Bank balance sheet items					
Cash, cash balances at central banks, other demand deposits	1807.1	402.2	614.4	92.3	215.5
Debt securities	2848.6	510.8	780.5	480.2	448.5
Encumbered assets	4274.6	975.8	1198.8	635.3	694.1
Unencumbered assets	17908.2	2755.9	6265.6	1811	2646.2
Value of derivatives on bank balance sheets					
Derivatives – Trading (asset side)	1412.6	470.1	580.6	70.1	120.5
Derivatives – Other (asset side)	139.7	13.1	69.1	9.9	15.4
Derivatives – Trading (liabilities side)	1379.5	447	572.4	70.6	116.1
Derivatives – Other (liabilities side)	202.7	19.8	71.3	20.3	11.7

*Sources: **SSM supervisory banking statistics**, EMIR data, ESRB Secretariat calculations.*
*Notes: The balance sheet data cover 113 significant euro area banks as at the end of 2019 at the highest level of consolidation. Not all significant banks are clearing members. Balance sheet values of derivatives are reported, e.g. market values rather than notional values. * The items on initial margins posted by IT and ES clearing member banks are shown as a sum for both countries due to trade repository data confidentiality requirements.*

Table A.5a

Comparison of capital charges for credit risk for banks

Risk-weighted framework for credit risk			
	Risk weight	**Basis**	**Legal reference**
CCP exposures			
Trade exposures to CCP (margins)	2%*	Small fraction of notional amount (Current exposure + Potential future exposure)	CRR Art. 306
Trade exposures of CCP members to clients	20%-150% (risk weight of the counterparty)	Small fraction of notional amount (Current exposure + Potential future exposure)	CRR Art. 304
Default fund contribution	2% (theoretical limit) – 1250% (worst case scenario) *****	Nominal amount	CRR Art. 307
Other exposures under standardized approach (for comparison)			
Central banks and central governments	0%**	Nominal amount	CRR Art. 114
Repos (fully collateralized)	0%***	Nominal amount	CRR Art. 222, Art. 223 in conjunction with Art. 227CRR
Covered bonds	10-100%	Nominal amount	CRR Art. 129
Banks and corporates (unsecured)	20-150% (depending on credit quality)	Nominal amount	CRR Art. 120-123
Residential mortgages (fully secured)	35%	Nominal amount	CRR Art. 125
Leverage ratio framework**			
	Capital charge	Basis	Legal reference
CCP exposures			
Trade exposures (margins)	3%	Small fraction of notional amount (Current exposure net of variation margin received + Potential future exposure)	CRR Art. 429a
Default fund contribution	3%	Nominal amount	CRR Art. 429
Other exposures (for comparison)			
Assets	3%	Nominal amount	CRR Art. 429
Repos	3%	Nominal amount + Uncollateralized part (counterparty risk add-on)	CRR Art. 429b

*Sources: European Systemic Risk Board, **EBA Interactive single rulebook**, Bank for International Settlements (BIS; **2019a-e**).*
Note: Treatment might differ depending on specific circumstances.
** 0% if the collateral posted is bankruptcy remote in the event of the CCP or any of its members defaulting.*
*** Applies to exposures with highest credit quality and also to other exposures to EU central governments and central banks denominated and funded in the domestic currency of that central government and central bank.*
**** Applies to repurchase agreements (repos) with a core market participant (including inter alia central banks, banks, insurance companies and pension funds) collateralised by exposures to central banks or central governments to which a 0% risk weight applies and where there is no currency or maturity mismatch.*
***** Binding from June 2021 onwards for EU banks.*
****** Depending on the size and distribution of clearing members' exposures and the CCP's own funds.*

Table A.5b

Liquidity and funding requirements for derivatives

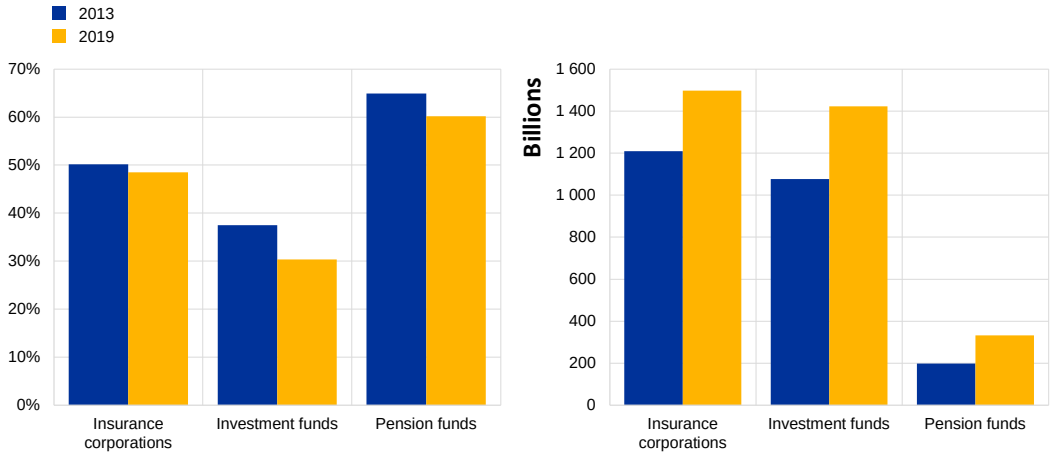
Framework	Definition	Numerator for derivatives	Denominator for derivatives	Legal references and notes
LCR	Unencumbered liquid assets / (Stressed outflows – inflows)	Posted margins decreases stock of available unencumbered assets	No effect, If collateralized by high quality liquid assets.	CRR Art. 412, 415-425
NSFR	Available stable funding/Required stable funding	0%	100% of derivative assets net of VM received minus derivative liabilities (if positive)	**Basel III: the net stable funding ratio, Table 1 and Table 2**
			+ 20% of derivative liabilities (gross of VM)	
				In EU applicable since June 2021
			85% of initial margins posted and contributions to default funds of CCPs	

*Sources: European Systemic Risk Board, **EBA Interactive single rulebook**, BIS (**2019a-e**).*
Note: Treatment might differ depending on specific circumstances.

Chart A.3

Liquid asset holdings of euro area non-bank financial institutions

(left panel: percentage of highly liquid securities in total securities holdings; right panel: EUR billions)

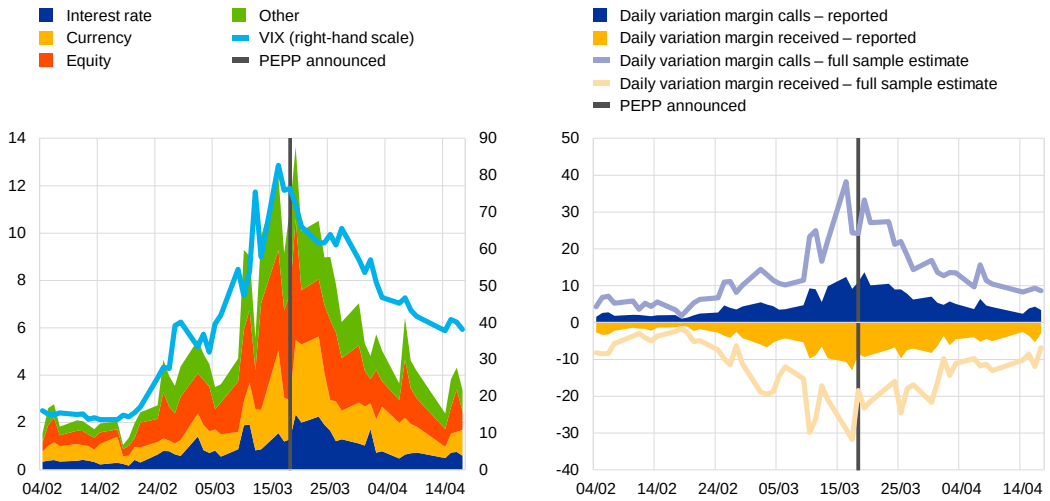


Sources: ECB Securities Holdings Statistics and ECB calculations.
Notes: Highly liquid securities are classified according to the Basel Liquidity Coverage Ratio requirements for high-quality liquid assets. Liquid bonds comprise Level 1 euro-denominated bonds issued by European governments and non-euro-denominated government bonds rated at least AA.

Chart A.4

The size and composition of variation margin calls on funds' derivative portfolios during the coronavirus market turmoil

(left panel: left-hand scale: EUR billions; right-hand scale: percentage points; right panel: EUR billions)

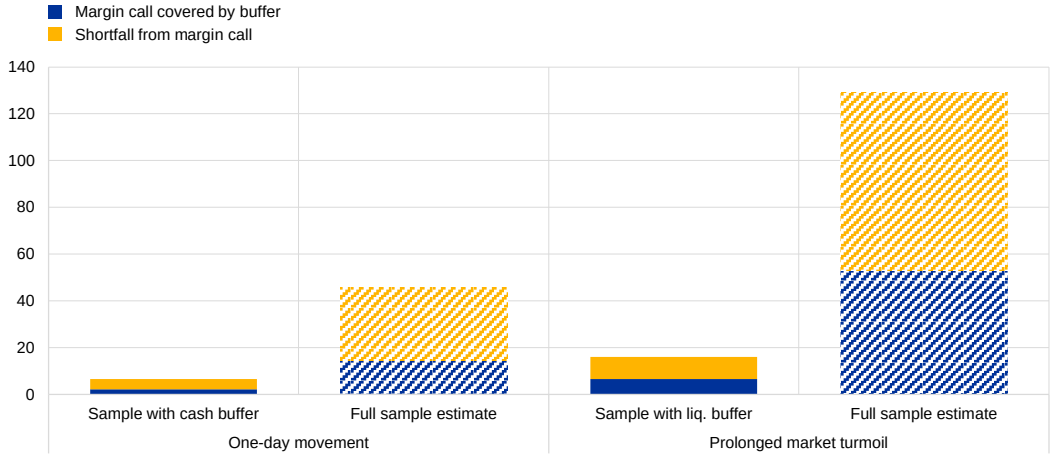


*Sources: Fache Rousová, L., Gravanis, M., Jukonis, A. and Letizia, E. (2020), "**Derivatives-related liquidity risk facing investment funds**", European Central Bank Financial Stability Review, Special Feature B, May 2020, Chart B.2, as based on EMIR data, sector classification from Lenoci and Letizia (2020), Bloomberg and authors' calculations.*
Notes: Left panel: calculated as the sum of all positive margin calls on euro area investment funds, where a positive margin call occurs if either variation margin posted increases or variation margin received decreases from one day to another. The classification of derivative portfolios into asset classes is based on notional amounts using an 80% threshold: if more than 80% of the notional value of contracts in the portfolio belongs to one asset class, the portfolio is classified in this asset class. Right panel: estimates are computed by rescaling the variation margin calls proportionally to the notional amount that they represent for a specific asset class, in order to take into account the fact that some trades are reported as collateralised by variation margin (in the field 'collateralisation' in EMIR reporting), but the size of the margin (in the fields 'variation margins posted' and 'variation margin received') is either not reported at all or not updated on a daily basis. PEPP stands for pandemic emergency purchase programme. The latest observation is for 17 April 2020.

Chart A.5

Margin calls, liquidity shortfalls and share of funds with shortfalls under two stress scenarios

	Scenario 1: Extreme one-day movement	Scenario 2: Prolonged market turmoil
Shocks on:		
interest rate curves	-25bps parallel shift	-75bps parallel shift
USD-EUR exchange rate	2% USD depreciation	5% USD depreciation
major equity indices	5% decline	15% decline
Rationale	Shocks similar to extreme market movements observed during September and October 2008 and March 2020	
Liquidity buffer	Cash	Cash and high-quality government bonds
Rationale	Daily variation markgins are typically required only in cash and there could be limited possibilities for collateral transformation under scenario 1	
Netting of collateral in- and out-flows among derivative portfolios	No	Yes
Rationale	Netting of collateral inflows and outflows among derive portfolios may not be possible under scenario 1 because the timing of collateral in- and outflows may not coincide under scenario 1. Instead, collateral inflows and outflows can offset each other under scenario 2	

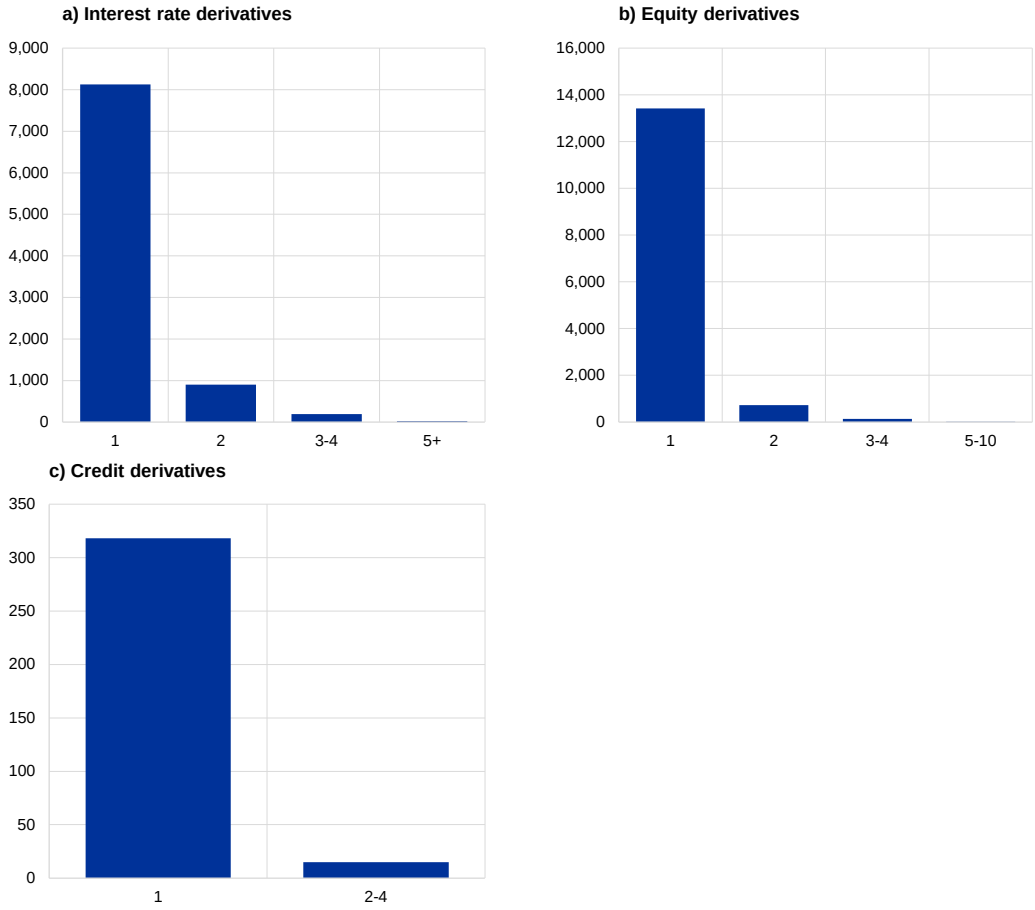


*Sources: Fache Rousová, L., Gravanis, M., Jukonis, A. and Letizia, E. (2020), "**Derivatives-related liquidity risk facing investment funds**", European Central Bank Financial Stability Review, Special Feature B, May 2020, Chart B.3, as based on EMIR data, sector classification from Lenoci and Letizia (2020), Refinitiv and authors' calculations.*
Notes: Based on data at the end of 2018. Sample with cash and liquidity buffers includes 3,523 funds, for which liquidity buffers are available. The full sample includes 13,969 funds, for which EMIR data indicate a holding of a derivative portfolio and variation margin can be calculated. The rescaling to the full sample assumes that the ratio of the cash shortfall to the size of the variation margin call is the same in the two samples. It is assumed that all derivative holdings are collateralised by variation margin.

Chart A.6

Number of dealers per client in derivatives markets

(x-axis: number of dealers; y-axis: frequency)



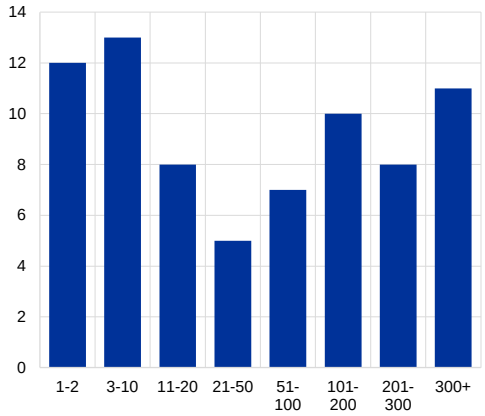
Sources: European Systemic Risk Board, EMIR data and ESRB Secretariat calculations.
Notes: Data are as of May 2019. See El-Omari, Y., Fiedor, P., Lapschies, S., Schaanning, E., Seidel, M. and Vacirca, F. (2020), "Interdependencies in central clearing in the EU derivatives market", European Systemic Risk Board Occasional Paper, forthcoming. The upper panel shows that approximatively 8,000 clients are using a single dealer to clear interest rate derivatives (albeit this may involve different dealers for different clients), while about 1,000 use two dealers and a negligible fraction of clients use more than three dealers to clear their interest rate derivatives.

Chart A.7

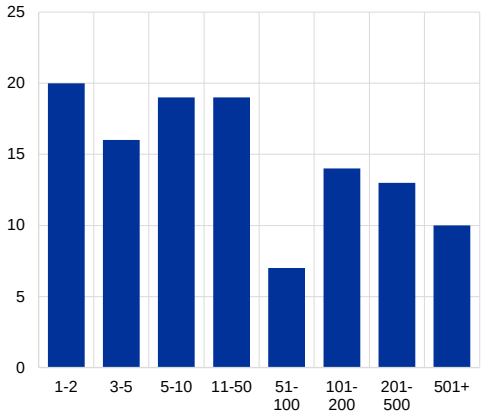
Number of clients per dealer in derivatives markets

(x-axis: number of clients; y-axis: frequency)

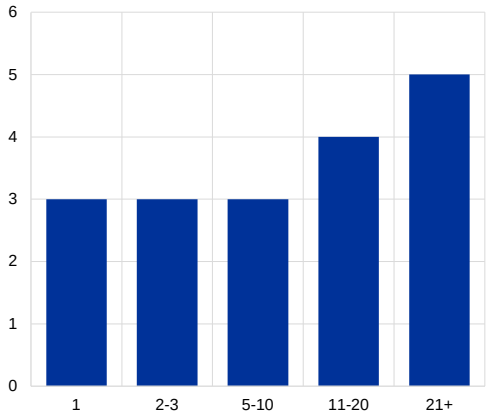
a) Number of clients per dealer – interest rate



b) Number of clients per dealer – equity



c) Number of clients per dealer – credit

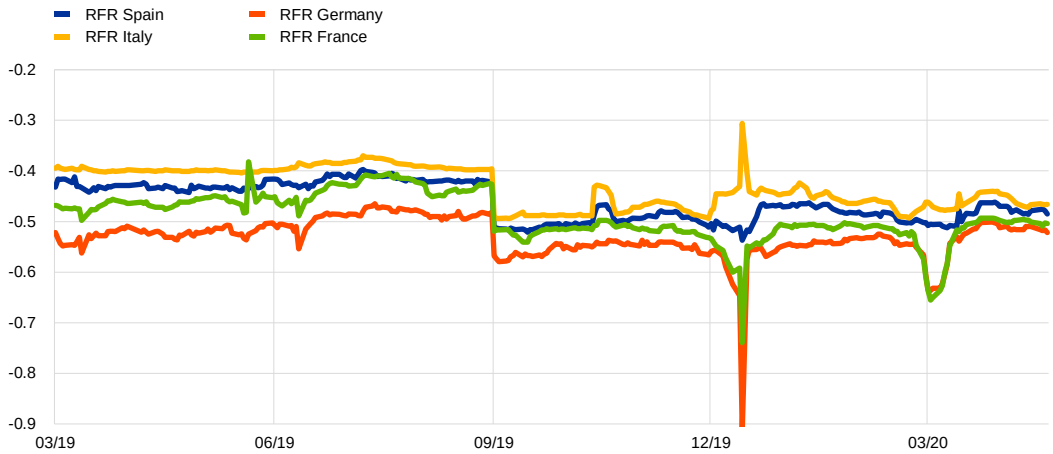


Sources: European Systemic Risk Board, EMIR data and ESRB Secretariat calculations.
Notes: Data are as of May 2019. See El-Omari, Y., Fiedor, P., Lapschies, S., Schaanning, E., Seidel, M. and Vacirca, F. (2020), "Interdependencies in central clearing in the EU derivatives market", European Systemic Risk Board Occasional Paper, forthcoming. The upper panel shows, for instance, that there are 11 clearing members that have more than 300 clients for whom they clear interest rate derivatives. Another 8 dealers are clearing members for between 201 and 300 clients, while 10 dealers clear for between 101-200 clients. About 25 dealers also clear for only 1-10 clients. The ranges are established for data confidentiality reasons.

Chart A.8

Repo funds rate

(percentage per annum)

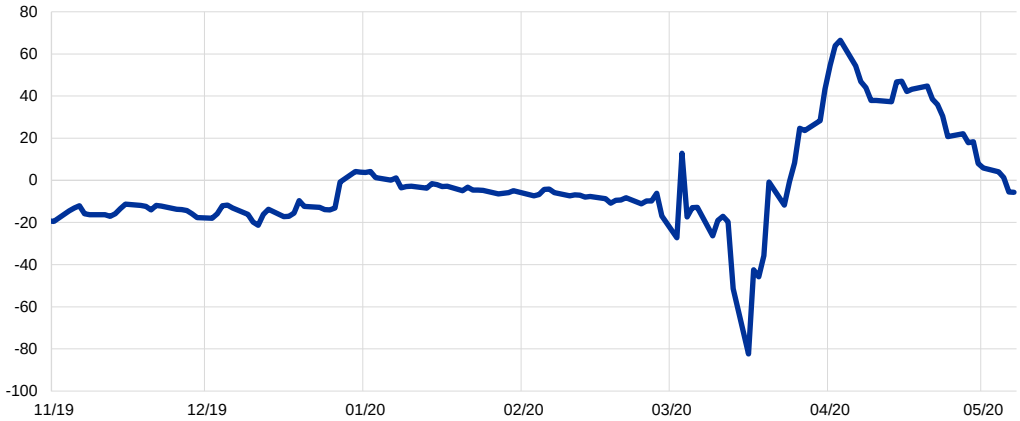


*Source: **Repo Funds Rate**.*
Note: The latest observation is for 7 May 2020.

Chart A.9

Cross-currency basis swap between USD and EUR

(basis points)



Source: Bloomberg.
Note: The latest observation is for 7 May 2020.

Annex B: Background information

B.1: Margining types and factors behind margin developments

Variation margins (VM): Positions are marked-to-market and changes in valuations due to price moves are exchanged on a daily basis in the form of variation margin between CCPs and other counterparties. Higher market volatility leads mechanically to higher VM flows.

Initial margins (IM): CCPs collect collateral to cover potential future losses on a defaulting participant's portfolio over the period where they manage the default and reallocate the portfolio to surviving participants (other counterparties also do so for bilateral OTC derivatives).

Intraday margin calls (IDMC): CCPs collect margins intraday, either on a business-as-usual basis or specifically in high volatility conditions. Such margin calls cover both mark-to-market changes (VM) and potential future losses (increases in IM). Increases in IDMCs were also observed over the recent period of market stress.

Potential future losses have increased sharply due to the higher volatility since the outbreak of the COVID-19 pandemic. As a result, initial margins increased sharply in some market segments. This was most visible in equity and commodity markets, where volatility has been particularly high.[17] Credit derivative markets have also seen large increases in initial margin requirements.[18] In other markets, such as interest rate derivatives, margin increases have been smaller due to less acute increases in volatility. There is evidence that some markets, in particular equities, experienced significantly higher trading volumes. The increase in the size of positions was one important factor in the increase in initial margin requirements. However, the main driver of the increase in initial margins was the response of margin models to increased volatility and tail risks. A number of CCPs have also increased initial margin parameters, in particular on equity instruments, which also led to higher initial margins.

B.2: Developments in repo markets

Until now, European money market statistical reporting (MMSR) data reported by the 50 largest banks suggests that the European repo market has remained remarkably stable during the COVID-19 crisis. Transaction volumes did not contract much, although the end-of-quarter effect in March was slightly more pronounced. However, trading volumes with investment funds, the second largest counterparty sector after banks, decreased quite sharply at the end of March. As volumes recovered again – to some extent – this pattern was at least partly driven by an end-of-quarter effect. After a temporary decrease in repo interest rates, possibly due to the ECB

[17] In respect of commodities, this may be due to factors other than the COVID-19 crisis, in particular oil production decisions and the resulting volatility.

[18] In the case of credit default swaps (CDS), a part of the margin model calculation is proportional to the level of the spread. Since spreads increased massively and remained at a higher level, this contributed to the sustained increase in initial margin for these asset classes.

intervention, rates are back to their normal levels (see also Chart A.8 in Annex A). In the bilateral market, the proportion of repos carrying zero, negative and positive haircuts has stayed broadly constant.[19] However, the absolute value of non-zero haircuts is becoming slightly larger (larger positive and negative haircuts, respectively), which may indicate that market participants are becoming slightly more risk-conscious.

While the repo market appears to be quite stable, a number of vulnerabilities are still present. While the bulk of the transactions are cleared by CCPs, as measured by the stock of outstanding repos, the bilateral repo market is very significant. As argued in the recent ESRB report[20], an increase in risk-aversion towards counterparty credit risk could result in lower capacity or even a breakdown in this market segment. Furthermore, a significant proportion of bilateral repos are backed by bonds issued by banks and financial institutions. Finally, there is a tendency for banks to use collateral issued in their own country.

B.3: Concentration and client clearing

The concentration of clearing services among a few CCPs and clearing members is a well-known issue, already clearly identified by a number of analyses carried out both at international and European level.[21] At the global level, for some asset classes most of the exposure in the market is concentrated among a handful of major CCPs[22] and a small number of G-SIBS are the top clearing members in the largest CCPs. At the European level, the situation is similar[23] even though the level of concentration seems lower; the 2018 ESMA report on the second CCP stress test exercise shows that the top clearing member groups have simultaneous exposures to multiple European CCPs even though "… *keeping in mind the limitations of the exercise, the interconnectedness analysis has indicated that these exposures would generally not hit simultaneously the default fund waterfall of all these CCPs under one of the common, internally consistent stress scenarios considered*." With regard to concentration, the analysis of the level of concentration at individual clearing participants, assessed using the Herfindahl-Hirschmann Index (HHI) methodology and thresholds, has not shown systemically critical concentrations at single clearing members or groups at EU-wide level.

Current client clearing arrangements can be characterised as follows: i) they are mostly based on Futures Industry Association documentation, but typically entail bespoke elements; ii) initial margin requirements are typically set using internal models of the clearing member, with CCP margin requirements as a floor; iii) counterparty-specific add-ons to those initial margin requirements can be quite high (up to 50%); iv) collateral schedules themselves are rather strict – typically only collateral accepted at CCPs is eligible, however, the repo desks of clearing providers

[19] Under the MMSR haircuts in the CCP-cleared segment are not reported.

[20] European Systemic Risk Board (2020a), **Mitigating the procyclicality of margins and haircuts in derivatives markets and securities financing transactions**, January 2020.

[21] Such analyses have been carried out at the international level by the Financial Stability Board (FSB) and Standard-Setting Bodies (SSBs) and at the European level by the European Securities Markets Association (ESMA) and the ESRB.

[22] For example, The SWAPClear service of LCH Ltd handles approximately 80% of the amount of cleared interest rate swaps; similarly, the ICE CCPs (US and Europe) clear the majority of CDS, both on indexes and single names.

[23] See ESMA's **EU-wide CCP Stress Test 2017**.

typically offer (but are not contractually obliged to provide) collateral transformation services to their clients; v) clearing providers typically have the contractual right to call for variation margin intraday, but will normally refrain from doing so and usually pre-fund variation margins that the CCP calls intraday; vi) the clearing member generally has the right to terminate the client clearing contract at short notice (typically, 1-3 months, which could be longer than it would take for clients to negotiate new contracts).

Concentration at CCPs and clearing members, combined with interconnectedness among CCPs through common clearing members, liquidity providers, custodians or investment counterparts, may also give rise to further cascade effects. The concentration of clearing services at a few CCPs and in a few clearing members active in several markets is a well-known issue, already clearly identified by a number of analyses carried out both at the international and at the European levels, as well as being documented in this report (see Tables A.1-A.3 and Figure A.2 in Annex A). The implications of a default increase with concentration and interconnectedness. Concentration at a CCP means that any material margin calls, non-pass-through of intraday variation margins, changes in haircuts, etc. would affect several major entities at the same time – or even the whole financial system. Likewise, concentration at clearing provider level means that material changes in client clearing conditions would affect many clients at the same time, possibly amplifying liquidity stress at the level of the market. However, the current framework for CCPs' liquidity stress testing only accounts for interconnectedness to a very limited extent, as there is no requirement to address concerns related to the concentration in the provision of different services to or by the CCPs. For example, a bank can be a clearing member at one CCP, but also at the same time play an important role at another CCP by providing liquidity to that CCP. Currently, liquidity stress tests of CCPs only partially account for such liquidity providing service relationships.

B.4: The impact on non-bank financial entities and non-financial corporations

Non-banks can be vulnerable to liquidity risks stemming from margin calls. Non-bank financial intermediaries and non-financial corporations (in the following grouped together as "non-banks") can have sizeable derivatives exposures. Because of this, as shown in simulations referenced in the recent ESRB report[24], non-banks such as some investment funds, pension funds and insurance companies could face potentially large margin calls. Since they do not have access to central bank refinancing operations, non-banks that choose to hold low cash buffers and low amounts of high quality collateral – which is typically accepted for margin calls – have to rely on funding and collateral transformation services provided by large banks and broker-dealers and may otherwise be forced to close positions.

Non-banks are particularly exposed to margin calls from counterparties in bilateral derivatives markets and from their client clearing provider. Non-banks typically use bilaterally cleared derivatives and/or access CCP-cleared derivative markets through a client clearing

[24] European Systemic Risk Board (2020a), **Mitigating the procyclicality of margins and haircuts in derivatives markets and securities financing transactions**, January 2020.

provider. Most non-banks thereby rely on the services of only one client clearing provider and do not have backup arrangements in place.

To date, there is little precise information available for assessing the severity of margin calls faced by non-banks during the crisis period since February 2020. Anecdotal evidence points to increasing margin calls also for non-banks such as funds, but most "severe" cases reported were linked to the United States rather than Europe.[25] On the funding side, MMSR transaction data show a large decrease in repo funding extended by EU banks to investment funds in March 2020, in particular to funds domiciled in tax havens such as the Cayman Islands. However, the drivers of the latter development are not clear at this point in time.

Going forward, non-banks could be particularly vulnerable in the event that client clearing providers impose less favourable conditions on them. If volatility in financial market segments picks up again, a situation might arise where client clearing providers impose less favourable conditions on clients. This could be prompted, for example, by less "comfortable" liquidity conditions at clearing providers. Such less favourable conditions might include: i) increased intraday margin calls to clients; ii) restricted funding of clients by repo desks; iii) higher total initial margin requirements, e.g. because of add-ons. Clearing providers might even be tempted to terminate client clearing contracts.

B.5: Examples of developments in bilaterally cleared markets

During recent weeks, there have also been some issues caused by margin calls in foreign currency swaps that were cleared bilaterally.[26] For example, in Norway this caused the banks' funding situation to deteriorate during the most turbulent days in March. Fund managers, insurance and pension funds hedge the NOK value of their foreign investments. When the NOK depreciated, they had to pay margin calls to their counterparties in currency swap agreements. They mostly sold liquid securities denominated in NOK to meet the margin calls, which led to a fall in the price of Norwegian bonds. The sale of bonds by fund managers to meet margin calls amplified the sharp fall in the prices of banks' bonds and worsened the financing market. Fund managers also reduced their currency hedges due to falling asset prices on foreign investments. This resulted in a further weakening of the NOK and in turn increased margin calls. The significant effect this had on banks and financial markets was due to the NOK weakening more than many other currencies and Norwegian fund managers having a large proportion of their foreign investment hedged in foreign currency. Banks' liquidity was not directly affected by the significant weakening of the NOK, since their foreign currency debt is hedged by currency swaps.

[25] According to US newspaper reports, it seems to be mainly Real Estate Investment Trusts (REITs) that have been affected by margin calls. Noteworthy developments in Europe include: UBS as one of the world's largest wealth managers reporting that investors are adjusting their portfolios in order to meet margin calls and ABN Amro confirming that it will incur a USD 200 million loss after a single client failed to meet margin calls.

[26] See also an example of pricing developments in currency swaps in Chart A.9 in Annex A.

B.6: Future risks including new channels

Possible channels of liquidity strain include measures taken by CCPs to mitigate credit risk stemming from collateral issuers or clearing members. So far, there is only anecdotal evidence that some CCPs have moderately increased haircuts on certain types of collateral. CCPs have not restricted collateral eligibility criteria or reduced issuer concentration limits. However, the crisis effect on collateral may materialise in the future, e.g. if government bonds or other bonds that are currently accepted as collateral were downgraded. CCPs may adjust their government and corporate bond haircuts or eligibility criteria in line with these developments. If such measures were taken in the future, clearing members would have to provide additional collateral or – in extreme scenarios, if some government bonds are excluded from the pool of eligible collateral – this could lead to clearing members having to substitute large amounts of collateral at short notice. Furthermore, there is so far no sign that CCPs are downgrading their internal credit assessment of their clearing members, a move which could in turn lead to additional margin calls (credit risk add-ons) on less resilient members. These measures are, however, more likely to become common in future weeks and months, as the implications of the macroeconomic context for counterparty credit risk become more evident.

It is reasonable to expect concentration and interconnectedness to increase in the short and medium term. Given the high fixed costs involved in providing clearing services and the low profitability of this line of business the number of institutions offering client clearing services might be expected to decrease over time. Anecdotal evidence already suggests that in previous years an increase in concentration has been observed following the exit of certain client clearing service providers.

At the current juncture, it is unclear whether the current stressed circumstances have further increased the concentration among CCPs/clearing members or interconnectedness. From the preliminary market intelligence carried out so far, no apparent major and new pinch point has emerged yet for the provision of clearing services; nor has any major player announced their intention to withdraw from this line of business.

As the Financial Stability Board (FSB) report of November 2018 has shown, the provision of client clearing services is usually carried out by clearing members as part of a package of services. Reportedly, such services when provided on a stand-alone basis do not offer an adequate return on the necessary investments. However, this trend does not seem specific only to central clearing services; it is common also to other post-trading services, such as custodial services which, likewise, entail significant fixed costs.

From this perspective, it can be assumed that the current risks linked to the increasing concentration and interconnectedness will remain, possibly increasing as the crisis evolves. Overall, the most significant risks linked to concentration and interconnectedness are related to likely cascade effects in the event of a major default. Such risks are likely to remain or even increase as the volatile market developments prevail.

B.7: Monitoring needs

As regards increases in margin levels, there is still a need for more granular evidence, most importantly to assess the performance of IM models in terms of procyclicality. The ESRB Expert Group on Margins and Haircuts should assess key aspects of this. First, they should analyse whether the changes in initial margins are significant or not when compared to variation margin flows. Second, they should examine whether initial margin models have responded as expected to the recent volatility episodes, or whether they have overshot and/or whether embedded anti-procyclicality has sufficiently mitigated initial margin increases. Another aspect of this monitoring is to further examine which types of financial instruments and market participants have been most affected by the crisis, in order to further tailor the ESRB's policy response.

Monitoring will also need to turn to potential problems resulting from collateral haircuts, eligibility or issuer caps, and from credit risk add-ons set by CCPs. As there is a greater than normal chance of these effects materialising in the weeks and months to come, the ESRB should conduct a fact-finding exercise to monitor whether mitigating measures taken by CCPs lead to temporary liquidity strains or difficulties in sourcing collateral, or to a widespread procyclical increase in margin levels due to credit risk add-ons.

At the microprudential level, the regulatory framework requires CCPs to play an active role in containing the potential consequences of a concentration of exposures. With regard to clearing members, CCPs are not mandated to impose concentration add-ons but are required to monitor the size of exposures vis-à-vis the depth and liquidity of the relevant market and consider applying such add-ons when appropriate. Moreover, CCPs are required to avoid excessive concentration at certain intermediaries for the provision of investment services or liquidity facilities. CCP supervisors are expected to closely monitor that CCPs have a proactive approach to limit concentration at certain intermediaries.

Imprint and acknowledgements

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This report gratefully acknowledges the comments by the members of:

ESRB General Board, ESRB Steering Committee, ESRB Advisory Technical Committee and ESRB Advisory Scientific Committee

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The cut-off date for the data included in this report was 15 May 2020.

For specific terminology please refer to the **ESRB glossary** (available in English only).

ISBN	978-92-9472-144-0 (pdf)
DOI	10.2849/22615 (pdf)
EU catalogue No	DT-01-20-343-EN-N (pdf)