Assessment of ASX Clearing and Settlement Facilities

October 2020

Contents

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Executive Summary

Purpose

In accordance with its responsibilities under the *Corporations Act 2001*, the Reserve Bank of Australia (the Bank) presents its annual Assessment of the ASX clearing and settlement (CS) facilities. ASX operates four CS facilities: two central counterparties (CCPs) – ASX Clear Pty Limited and ASX Clear (Futures) Pty Limited – and two securities settlement facilities (SSFs) – ASX Settlement Pty Limited and Austraclear Pty Limited. The report details the CCPs' and SSFs' compliance with the Bank's *Financial Stability Standards for Central Counterparties* (CCP Standards) and *Financial Stability Standards for Securities Settlement Facilities* (SSF Standards) (together, the Financial Stability Standards or FSS), as well as the facilities' more general obligation to do all other things necessary to reduce systemic risk. The assessment is as at the end of June 2020; however, where relevant, developments after this time are discussed.

Conclusion

It is the Bank's assessment that the CS facilities 'observed' or 'broadly observed' all relevant requirements under the FSS as at 30 June, with the exception of the Margin Standard (CCP Standard 6), which was rated as 'partly observed' in ASX Clear (Futures), and the Operational Risk Standard (CCP Standard 16, SSF Standard 14), which was rated as 'partly observed' in ASX Clear and ASX Settlement. On balance, the Bank has concluded that the facilities have conducted their affairs in a way that causes or promotes overall stability in the Australian financial system. However, ASX will need to place a high priority on addressing recommendations related to margin at ASX Clear (Futures) and operational risk at ASX Clear and ASX Settlement.

Progress towards previous priorities

ASX has made progress against the Bank's regulatory priorities identified in its 2019 Assessment report:

- *General business risk.* ASX has transferred business, operational and investment risk capital to be held directly by the CS facilities to address the risk that the CS facilities are unable to access this capital when required. However, further work is required to mitigate the risk of potential shortfalls in the CCPs' investment risk capital and to formalise the approach to SSF business and operational risk capital.
- *Governance and operational risk management.* ASX has substantively completed implementation of the recommendations of an external review of its operational risk management and technology governance carried out in 2018 at the instigation of the Bank and the Australian Securities and Investments Commission (ASIC).
- *Cover 2 breaches.* The ASX CCPs have formalised their risk appetite for the frequency and magnitude of Cover 2 stress test breaches.
- *Legal basis.* ASX implemented changes to CCP operating rules to enhance the legal certainty of default management actions, and has taken steps to support the repatriation of New Zealand dollar (NZD) collateral in the event of a clearing participant default and seek designation as a settlement system in New Zealand.

Other material developments

Other material developments relevant to the supervision of the ASX CS facilities that occurred during the assessment period include:

- *COVID-19 response.* ASX has responded to the significant operational and financial risk management challenges presented by the COVID-19 pandemic. The facilities performed very well in most respects during a time of heightened volatility, although some areas of vulnerability in more extreme stress scenarios have been identified.
- *Clearing House Electronic Sub-register System (CHESS) replacement.* ASX continued its work on replacing CHESS, its core system for clearing, settlement and other post-trade services for the Australian cash equities market. ASX consulted on an extension of the timeline of the CHESS replacement project to April 2022.

Priorities for the next assessment period

The Assessment includes recommendations aimed at enabling the ASX CS facilities to either observe or continue to observe the requirements under particular FSS. These recommendations relate to areas such as :

- addressing constraints to the processing capacity of CHESS and implementing the CHESS replacement system
- managing the risks associated with large, late-in-day price movements
- developing a systematic framework to address the risk of destabilising increases in margin and other financial risk requirements during volatile periods
- enhancing default management and recovery arrangements
- aligning financial risk management practices and governance arrangements with international guidance on CCP resilience.

The Assessment also identifies areas that will be an important part of the Bank's supervisory engagement with ASX over the next assessment period. These include:

- a deep-dive assessment by the Bank of the governance arrangements of the ASX CS facilities
- discussing with ASX whether its CCP stress test scenarios are appropriately calibrated to cover losses in 'extreme but plausible' market conditions.

1. Summary of Regulatory Priorities

This section summarises actions taken by the ASX CS facilities during the 12 months to June 2020 (the assessment period) in relation to recommendations identified in the Bank's 2019 *Assessment of ASX Clearing and Settlement Facilities* (the 2019 Assessment), and summarises the recommendations identified by the Bank in its 2020 Assessment of the facilities against the FSS. Further detail is provided in section 2, which describes the response of the ASX CS facilities to COVID-19; section 3, which describes other material developments in the CS facilities relevant to the FSS; and section 4, which provides the results of a detailed assessment conducted by the Bank of the facilities' default management and recovery arrangements. This year's Assessment does not include a detailed assessment of how the ASX CCPs met each of the FSS at the end of 2019/20; this reflects the significant other demands on both the ASX CS facilities and the supervisory team at the Bank stemming from operational and risk management responses to the COVID-19 pandemic.[1]

1.1 Progress against 2019 Recommendations

In the Bank's 2019 Assessment, the ASX CS facilities were rated 'observed' or 'broadly observed' for all FSS, with the exception of the General Business Risk Standard (CCP Standard 14, SSF Standard 12), which was rated as 'partly observed' in each facility. The 2019 Assessment made recommendations for steps to be taken for the CS facilities to observe or to continue to observe various standards. Table 1 summarises actions taken by the facilities in relation to these recommendations during the assessment period.

The Bank's 2019 Assessment also identified a number of areas of supervisory focus for the current assessment period. Material developments in each of these areas are described in section 3 (see Appendix A for a mapping of these sections to each area of supervisory focus).

1.2 2020 Assessment and Regulatory Priorities

It is the Bank's assessment that the CS facilities 'observed' or 'broadly observed' all relevant requirements under the FSS as at 30 June 2020, with the exception of the Margin Standard (CCP Standard 6), which was rated as 'partly observed' in ASX Clear (Futures), and the Operational Risk Standard (CCP Standard 16, SSF Standard 14), which was rated as 'partly observed' in ASX Clear and ASX Settlement (Table 2).[2] On balance, the Bank has concluded that the facilities have conducted their affairs in a way that causes or promotes overall stability in the Australian financial system.[3] However, the facilities will need to place a high priority on addressing the recommendations related to margin

1 Under *The Reserve Bank's Approach to Supervising and Assessing Clearing and Settlement Facility Licensees*, the Bank was not due to conduct its next detailed assessment of the ASX SSFs until the end of 2020/21.

2 In undertaking its Assessment, the Bank has applied the rating system used in the *Principles for Financial Market Infrastructures: Disclosure Framework and Assessment Methodology* produced by the Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions in December 2012. See Appendix C for more detail on this system.

3 Section 821A(aa) of the Corporations Act requires that a CS facility licensee, to the extent reasonably practicable to do so, comply with the FSS and do all other things necessary to reduce systemic risk.

and operational risk. Compared to the 2019 Assessment, the Bank has raised each of the CS facilities' ratings for Governance (CCP and SSF Standard 2) to 'observed', reflecting enhancements made under the Building Stronger Foundations program and has raised the CS facilities' ratings for General Business Risk (CCP Standard 14, SSF Standard 12) to 'broadly observed', reflecting changes to ASX's arrangements for holding business, operational and investment risk capital (see section 3). The rating for ASX Clear (Futures) for Margin (CCP Standard 6), and ASX Clear and ASX Settlement for Operational Risk (CCP Standard 16, SSF Standard 14) have been lowered to 'partly observed', reflecting issues identified as part of the Bank's detailed review of ASX's response to COVID-19 (see section 2). The rating for ASX Clear for margin (CCP Standard 6) has been lowered to 'broadly observed'.

Table 1: Summary of Progress against 2019 Recommendations to Observe or Continue Observing the FSS

Recommendation	Standard	Facility	Actions
Legal Basis. The ASX CS facilities should take the following steps to strengthen their legal basis: • ASX Clear (Futures) should take all possible steps to achieve designation as a settlement system in New Zealand and develop a procedure supporting the repatriation of NZD collateral • the ASX CCPs should implement changes to their operating rules to enhance the legal certainty of default management actions • the ASX CS facilities should review and update processes and procedures governing the commissioning, reviewing and updating of legal opinions • the ASX CS facilities should establish a periodic review, to be carried out at least every five years, of operating rules and procedures for all CS facilities to ensure they are clear and understandable and are consistent with industry standards and market protocols.	CCP and SSF Standard 1	All facilities	*Partly addressed.* ASX Clear (Futures) achieved designation as a settlement system in New Zealand on 14 August. ASX established a policy and processes supporting the repatriation of NZD collateral. On 6 July, ASX implemented changes to CCP operating rules to enhance the legal certainty of default management actions. ASX established guidelines governing the commissioning, reviewing and updating of legal opinions. ASX plans to finalise enhancements to these guidelines in the coming assessment period taking into account recent feedback from the Bank. ASX plans to commence work on a process to establish a periodic review of operating rules and procedures for all CS facilities in the coming assessment period.

Recommendation	Standard	Facility	Actions
Governance. The ASX CS facilities should continue to implement plans to strengthen their governance arrangements in line with the FSS and consistent with the CCP Resilience Guidance: • as part of ASX's Building Stronger Foundations program, the facilities should complete implementation of plans to embed their risk appetite in business processes and decision-making throughout the organisation • as part of ASX's Building Stronger Foundations program, the facilities should complete implementation of plans to improve first-line risk ownership • ASX Clear and ASX Clear (Futures) should ensure that roles and processes in relation to the governance of financial risk management are appropriately formalised and documented in order to ensure that the CS Boards have sufficient information to effectively oversee the CCPs • ASX Clear and ASX Clear (Futures) should ensure that their arrangements for disclosure to, and soliciting feedback from, stakeholders cover all relevant aspects of the CCPs' risk management frameworks, including margin sensitivity analysis, reverse stress testing and management of procyclicality.	CCP and SSF Standard 2	All facilities	*Partly addressed.* ASX completed the development of business unit level key risk indicators (KRIs) that provide a more detailed breakdown of the Board-level KRIs established in November 2018. These embed the Board-defined risk appetite in day-to-day operations. ASX also implemented a framework for capturing observations and challenges from its central risk oversight function (second-line risk) across its key projects to strengthen its consideration of risk in business processes and decision-making. ASX established risk forums for both first-line (i.e. business and operational areas) and second-line risk to promote improved risk reporting and present first-line considerations of current and emerging risks, controls and updates on ASX culture to ASX's leadership. ASX implemented some measures to formalise and document roles and processes in relation to the governance of risk management. This work will continue over the coming assessment period. Work to update ASX's policy to include the disclosure and feedback requirements set out in the CCP Resilience Guidance was reprioritised. ASX plans to update its policy in the coming assessment period.
CCP Resilience Guidance. To align financial risk management practices with the CCP Resilience Guidance the ASX CCPs should continue to implement plans to: • enhance the comprehensiveness of stress testing to ensure risks are appropriately identified, captured and stressed • enhance analysis and justification of assumptions used in stress testing models so that risks are adequately captured • remove the assumption made by ASX Clear that excess collateral will not be withdrawn or decreased during periods of stress to more accurately reflect the extreme but plausible conditions appropriate for stress testing.	CCP Standards 4 and 7	Both CCPs	*Partly addressed.* The ASX CCPs are in the process of implementing a multi-year work program to address this recommendation. Key enhancements over the assessment period include the approval of new stress test scenarios and revisions to ASX's stress testing methodology to better incorporate intraday price movements. ASX also established a formal process that aims to ensure assumptions in stress tests remain consistent with the legal framework under which ASX operates. ASX enhanced its model validation process, including by introducing a benchmarking exercise by which alternative models will be considered.
Cover 2 breaches. ASX Clear and ASX Clear (Futures) should formalise thresholds for the frequency and magnitude of Cover 2 stress test breaches that would result in a recalibration of the overall default fund or additional initial margin (AIM) buffer.	CCP Standard 4	Both CCPs	*Fully addressed.* CS Boards approved KRIs that establish a revised risk appetite for credit and liquidity Cover 2 stress test breaches. The new framework requires ASX staff to report to CS Boards on the cause of any Cover 2 breach and to propose mitigating actions if ASX's risk appetite is breached.

Recommendation	Standard	Facility	Actions
Intraday exposures. By 30 June 2020, ASX Clear (Futures) should embed, review and refine its arrangements to monitor and manage intraday exposures created during ASX 24's Night Session on a near real-time basis, or take other steps to ensure comprehensive management of intraday exposures created during ASX 24's Night Session.	CCP Standard 6	ASX Clear (Futures)	*Partly addressed.* ASX implemented an automated alert at 2 am to identify participants that should be subject to an intraday margin call. ASX also revised the calibration of its overnight buffer margin to be more responsive to increases in market volatility. The remaining elements of this recommendation will be addressed as part of work on late-in-day price movements (see Table 3).
Liquidity add-ons. ASX Clear should complete the implementation of add-ons to manage liquidity risk for cash market products and products margined using the CME Standard Portfolio Analysis of Risk (SPAN) model.	CCP Standard 6	ASX Clear	*Not addressed.* ASX intends to conduct analysis in the coming assessment period to determine whether there is a need to implement liquidity add-ons for cash market products and products margined using the CME SPAN model.
Inter-commodity spread concessions (ICCs). ASX Clear (Futures) should complete the review of its methodology for calibrating ICCs used in its margining model and resume reviews of ICCs on a regular basis.	CCP Standard 6	ASX Clear (Futures)	*Partly addressed.* ASX conducted a review that determined that enhancements to its ICC methodology would lead to an immaterial change in initial margin and so were not necessary. ASX intends to conduct analysis to verify this conclusion and review its ICCs for ASX Clear (Futures) under its existing methodology on a quarterly basis from September 2020.
Segregation and portability. ASX Clear should conduct an assessment of whether the protections from arrangements utilising a commingled house/client account structure remain materially equivalent to those provided by omnibus or individual client segregation. ASX should consult with the Bank on the outcome of this assessment within 12 months of the CHESS replacement system going live.	CCP Standard 13	ASX Clear	*Not addressed*. No action is required until the CHESS replacement system has gone live. The go-live date has been delayed until April 2022.
General business risk. The ASX CS facilities should implement changes to the ASX Group Support Agreement to ensure that business, operational and investment risk capital is available to the CS facilities when required, including in circumstances where the financial standing of the CS facilities or the ASX Group entities holding the capital is in doubt.	CCP Standard 14, SSF Standard 12	All facilities	*Partly addressed.* ASX has transferred business, operational and investment risk capital to be held directly by the CS facilities. However, further work is required to mitigate the risk of potential shortfalls in the CCPs' investment risk capital under the new arrangements, and to formalise changes to ASX's approach to business and operational risk capital requirements for the SSFs.

Recommendation	Standard	Facility	Actions
Operational risk management. The ASX CS facilities should complete implementation of plans under ASX's Building Stronger Foundations program to: • consolidate and develop a consistent enterprise-wide view of systems, policies, procedures and controls to identify, monitor and manage operational risks • improve systems and processes supporting change management and incident management • enhance knowledge management in order to reduce reliance on key individuals.	CCP Standard 16, SSF Standard 14	All facilities	*Mostly addressed.* ASX completed the build and rollout of its Enterprise Risk, Internal Audit & Compliance Application that allows it to capture, consolidate and analyse risk, compliance and audit data across dashboards and achieve consistent reporting and management of enterprise risks. ASX also completed the build and rollout of its IT Service Management tool to support its management of incidents and problems. The tool acts as a single source of truth by providing an end-to-end view for a majority of its infrastructure assets and systems, and lessening the reliance on its subject matter experts. Further work is required to fully achieve the benefits of these tools, as a richer history of incidents, risk and compliance data is built up and used over a longer period.
Risk management systems. ASX should establish a long-term plan to ensure that its core systems have the functionality to fully support its risk management approach, including migrating risk management systems currently operated on non-core systems to core systems.	CCP Standard 16	Both CCPs	*Partly addressed.* ASX has established a five-year risk IT strategic roadmap that includes actions to address this recommendation. Under this plan, a rebuild of ASX's credit stress testing systems is due to complete in 2021. Other enhancements to address this recommendation are planned for later years.

Table 2: 2020 Ratings of FSS Observance[(a),(b)]

Standard	ASX Clear	ASX Clear (Futures)	ASX Settlement	Austraclear
CCP and SSF Standard 1: Legal Basis	Observed (→)	Observed (→)	Observed (→)	Observed (→)
CCP and SSF Standard 2: Governance	Observed (↑)	Observed (↑)	Observed (↑)	Observed (↑)
CCP and SSF Standard 3: Framework for the Comprehensive Management of Risks	Observed (→)	Observed (→)	Observed (→)	Observed (→)
CCP and SSF Standard 4: Credit Risk	Broadly observed (→)	Broadly observed (→)	N/A	N/A
CCP and SSF Standard 5: Collateral	Observed (→)	Observed (→)	N/A	N/A
CCP Standard 6: Margin	Broadly Observed (↓)	Partly observed (↓)	---	---
CCP Standard 7 and SSF Standard 6: Liquidity Risk	Broadly observed (→)	Broadly observed (→)	Observed (→)	Observed (→)
CCP Standard 8 and SSF Standard 7: Settlement Finality	Observed (→)	Observed (→)	Observed (→)	Observed (→)
CCP Standard 9 and SSF Standard 8: Money Settlements	Observed (→)	Observed (→)	Observed (→)	Observed (→)
SSF Standard 9: Central Securities Depositories	---	---	Observed (→)	Observed (→)
CCP Standard 10: Physical Deliveries	N/A	Observed (→)	---	---
SSF Standard 10: Exchange-of-value Settlement Systems	---	---	Observed (→)	Observed (→)
CCP Standard 11: Exchange-of-value Settlements	Observed (→)	Observed (→)	---	---
CCP Standard 12 and SSF Standard 11: Participant Default Rules and Procedures	Observed (→)	Observed (→)	Observed (→)	Observed (→)
CCP Standard 13: Segregation and Portability	Observed (→)	Observed (→)	---	---
CCP Standard 14 and SSF Standard 12: General Business Risk	Broadly observed (↑)	Broadly observed (↑)	Broadly observed (↑)	Broadly observed (↑)
CCP Standard 15 and SSF Standard 13: Custody and Investment Risks	Observed (→)	Observed (→)	N/A	Observed (→)
CCP Standard 16 and SSF Standard 14: Operational Risk	Partly observed (↓)	Broadly observed (→)	Partly observed (↓)	Broadly observed (→)
CCP Standard 17 and SSF Standard 15: Access and Participation Requirements	Observed (→)	Observed (→)	Observed (→)	Observed (→)
CCP Standard 18 and SSF Standard 16: Tiered Participation Arrangements	Observed (→)	Observed (→)	Observed (→)	Observed (→)
CCP Standard 19 and SSF Standard 17: FMI Links	Observed (→)	Observed (→)	Observed (→)	Observed (→)
CCP Standard 20 and SSF Standard 18: Disclosure of Rules, Key Policies and Procedures, and Market Data	Observed (→)	Observed (→)	Observed (→)	Observed (→)
CCP Standard 21 and SSF Standard 19: Regulatory Reporting	Observed (→)	Observed (→)	Observed (→)	Observed (→)

(a) The arrows in brackets indicate the change in ratings from last year: a horizontal arrow indicates no change; a single vertical up arrow indicates a single upgrade (e.g. from 'broadly observed' to 'observed'); a single vertical down arrow indicates a single downgrade (e.g. from 'observed' to 'broadly observed'); and a double vertical down arrow indicates a downgrade by two grades (e.g. from 'observed' to 'partly observed'). Green text is used for upgraded ratings and red text for downgraded ratings.

(b) 'N/A' means that the Bank has determined that the standard is not applicable to the ASX facility; '---' means that an equivalent standard does not exist for the type of facility (e.g. for CCP Standard 6: Margin, there is no equivalent standard for SSFs).

The Bank has made recommendations that the CS facilities should address to observe or continue to observe relevant requirements in the FSS. This includes recommendations to strengthen financial and operational risk management arrangements in light of issues identified in ASX's response to COVID-19, strengthen default management and recovery arrangements, and implement the CHESS replacement system in a timely manner. These recommendations are set out in Table 3 and will be a key part of the Bank's regulatory priorities in the next assessment period.

Table 3: 2020 Recommendations to Observe or Continue Observing the FSS

Recommendation	Standard	Facility
Legal Basis. The ASX CS facilities should take the following steps to strengthen their legal basis: • the ASX CS facilities should review and update processes and procedures governing the commissioning, reviewing and updating of legal opinions • the ASX CS facilities should establish a periodic review, to be carried out at least every five years, of operating rules and procedures for all CS facilities to ensure they are clear and understandable and are consistent with industry standards and market protocols. For more information, see section 3.1.	CCP and SSF Standard 1	All facilities
CCP Resilience Guidance. To align financial risk management practices and governance arrangements with the CCP Resilience Guidance the ASX CCPs should continue to implement plans to: • enhance the comprehensiveness of stress testing to ensure risks are appropriately identified, captured and stressed • enhance analysis and justification of assumptions used in stress testing models so that risks are adequately captured • remove the assumption made by ASX Clear that excess collateral will not be withdrawn or decreased during periods of stress to more accurately reflect the extreme but plausible conditions appropriate for stress testing • ensure that roles and processes in relation to the governance of financial risk management are appropriately formalised and documented in order to ensure that the CS Boards have sufficient information to effectively oversee the CCPs • ensure that their arrangements for disclosure to, and soliciting feedback from, stakeholders cover all relevant aspects of the CCPs' risk management frameworks, including margin sensitivity analysis, reverse stress testing and management of procyclicality. For more information, see Box B.	CCP Standards 2, 4 and 7	Both CCPs
Recovery and replenishment arrangements. ASX should assess the risk that participants may default on their obligations or choose to resign from ASX Clear due to difficulty in meeting recovery or replenishment obligations. For more information, see section 4.3.4.	CCP Standards 3 and 12	ASX Clear
Procyclicality. Consistent with the CCP Resilience Guidance, the ASX CCPs should develop a systematic procyclicality framework designed to avoid destabilising increases in margin and other financial risk requirements during periods of heightened market volatility. For more information, see section 2.2.3.	CCP Standards 5 and 6	Both CCPs
Margin period of risk. The ASX CCPs should review whether their calibration of margin period of risk (MPOR) assumptions and margin add-ons is consistent with the time it would take to liquidate large and diverse portfolios, taking into account the sequencing of liquidation in a default scenario. For more information, see section 4.3.6.	CCP Standards 6 and 12	Both CCPs

Recommendation	Standard	Facility
Late-in-day price movements. The ASX CCPs should put in place arrangements that allow them to monitor and manage exposures arising from large late-in-day price movements, including movements that exceed the coverage provided by initial and additional margin. For ASX Clear (Futures), this also applies to price movements during the overnight trading session. For more information, see section 2.2.3.	CCP Standard 6	Both CCPs
Liquidity add-ons. ASX Clear should complete its review of add-ons to manage liquidity risk for cash market products and products margined using the CME SPAN model. ASX Clear should implement these add-ons if the review concludes they are needed. For more information, see section 3.4.2.	CCP Standard 6	ASX Clear
Inter-commodity spread concessions. ASX Clear (Futures) should complete its analysis of the costs and benefits of changing its ICC methodology and, if no change is justified, resume regular reviews of ICCs under its current ICC methodology. For more information, see section 3.4.2.	CCP Standard 6	ASX Clear (Futures)
Liquidity risk. ASX Clear (Futures) should take all necessary steps to establish an ability to access liquidity from the Bank in respect of a defaulting participant's non-cash collateral. For more information, see section 4.3.3.	CCP Standard 7	ASX Clear (Futures)
Deferral of the CHESS batch. ASX should test the process of deferring the CHESS batch overnight and review the implications of this approach for default management. For more information, see section 4.3.6.	CCP Standard 12, SSF Standard 11	ASX Clear and ASX Settlement
Segregation and portability. ASX Clear should conduct an assessment of whether the protections from arrangements utilising a commingled house/client account structure remain materially equivalent to those provided by omnibus or individual client segregation. ASX should consult with the Bank on the outcome of this assessment within 12 months of the CHESS replacement system going live. For more information, see section 3.3.1.	CCP Standard 13	ASX Clear
Business and operational risk capital. The Boards of the ASX SSFs should formally establish an appropriate methodology for determining the level of business and operational risk capital held at each SSF and ensuring the level of capital remains appropriate over time. For more information, see section 3.1.1.	SSF Standard 12	Both SSFs
Investment risk capital. The ASX CCPs should hold an additional capital buffer to cover potential shortfalls in investment risk capital at each CCP. ASX should establish a process to periodically recalibrate the split of capital held by each CCP and make any necessary adjustments to the buffer. For more information, see section 3.1.1.	CCP Standard 14	Both CCPs
CHESS capacity and system replacement. ASX should implement the new clearing and settlement system for cash market transactions as soon as this can be safely achieved by ASX and users of CHESS. In the short term, ASX should carry out plans to increase the capacity of the current CHESS system and develop contingency arrangements to address future extreme increases in volumes that exceed current processing capacity. For more information, see section 3.3.1.	CCP Standard 16, SSF Standard 14	ASX Clear and ASX Settlement
Operational risk management. The ASX CS facilities should continue to embed the use of new systems and processes supporting change management, incident management and knowledge management, and use these systems to identify, monitor and manage operational risks at an enterprise-wide level. ASX internal audit should independently review the effectiveness of these systems and processes in practice. For more information, see section 3.2.	CCP Standard 16, SSF Standard 14	All facilities

Recommendation	Standard	Facility
Risk management systems. The ASX CCPs should implement plans to ensure that their core systems have the functionality to fully support their risk management approach, including by migrating processes currently operated on non-core systems to core systems. For more information, see section 3.3.2.	CCP Standard 16	Both CCPs

In addition to recommendations to enable the facilities to observe or continue to observe the FSS, the Bank has identified several areas that will be an important part of its supervisory engagement with ASX in the next assessment period. These include the 2020/21 special topic assessment of governance, and are summarised in Table 4.

Table 4: 2020/21 Areas of Supervisory Focus

Development	Standard	Facility
Special topic		
Governance special topic. The Bank will carry out a special topic assessment of the ASX CS facilities' governance, with a secondary focus on the facilities' framework for the comprehensive management of risks and their arrangements for identifying, monitoring and managing general business risk.	CCP Standards 2, 3 and 14, SSF Standards 2, 3 and 12	All facilities
Default management and recovery. The Bank will discuss with ASX the establishment of a workplan to enhance its default management and recovery frameworks, taking into account potential gaps identified in the special topic assessment. These include: • a review of the legal certainty of arrangements for ASX Limited to replenish ASX contributions to the CCPs' default funds • the implementation of planned enhancements to fire drills, lessons learned from the Nasdaq default and benchmarking to the Committee on Payments and Market Infrastructures-International Organization of Securities Commissions (CPMI-IOSCO) paper on *Central Counterparty default management auctions – Issues for consideration* • the continued enhancement of its recovery plan via benchmarking it to the CPMI-IOSCO *Recovery of financial market infrastructures – Revised report* and updating it for the gaps identified • the implementation of enhancements to the default management framework including more frequent audits, an updated approach to default loss estimates and improved documentation. For more information see section 4.	CCP Standards 12, 2,3, 4 7 and 14, SSF Standards 11, 2 and 3	All facilities
Planned work by the ASX CS facilities		
Legal basis. Completion of work to enhance, formalise and document business-as-usual (BAU) controls for legal risks. For more information, see section 3.1.2.	CCP Standard 1 and SSF Standard 1	All facilities
CCP Resilience Guidance. Implementation of ASX's plans to address gaps against the CCP Resilience Guidance that are minor but indicative of good practice in financial risk management. For more information, see Box B.	CCP Standards 2, 4, 5, 6, 7 and 15	Both CCPs
Cyber resilience. Continued enhancement of ASX's cyber resilience via: • the implementation of actions identified in ASX's Cyber Strategy • ASX's evaluation of current and emerging technology that could lead to further enhancements to the abilities of ASX to recover from cyber attacks in a timely manner. For more information, see section 3.3.4.	CCP Standard 16, SSF Standard 14	All facilities
Other		

Stress test severity. The Bank will continue to discuss with ASX whether its CCP stress test scenarios are appropriately calibrated to cover losses in 'extreme but plausible' market conditions. For more information, see section 2.2.4.	CCP Standard 4, 7	Both CCPs
Collateral concentration limits. The Bank will discuss with ASX Clear its conclusion that it is not necessary to impose concentration limits for equity collateral. For more information, see section 3.4.3.	CCP Standard 5	ASX Clear
ASX Group support agreement. The Bank will conduct a broader review of the ASX Group Support Agreement, covering aspects outside the scope of the 2018/19 special topic assessment of the CS facilities' legal basis.	CCP Standard 14 and SSF Standard 12	All facilities

In addition to the recommendations and supervisory focus, the Bank expects ASX to work towards continual strengthening of its risk management arrangements. This is in accordance with the general obligation on CS facilities to do all things necessary to reduce systemic risk. ASX recognises this and has governance arrangements in place to motivate and encourage continuous improvement. As part of its ongoing supervisory engagement, the Bank will continue to discuss with ASX areas where there may be opportunities for improvement.

2. Response to COVID-19

An event such as the COVID-19 pandemic has the potential to cause significant operational disruption for operators of systemically important financial market infrastructures (FMIs) such as the ASX CS facilities. For example, it could affect the ability of the FMI, its participants and service providers to continue operating systems or to recover normal operations in the event of an outage. This section discusses how ASX has responded to these challenges, as well as those posed by the significant increases in trading activity and price movements observed during the pandemic.

2.1 Operational Risk

2.1.1 Pandemic response plan

In mid-January, ASX initiated its pandemic response plan in preparation for moving to increasing levels of preventative controls amid reports of elevated risk of spread of infection. The plan aims to maintain continuity of operations while reducing the risk of infection to key staff and responding to broader social isolation measures. In March, ASX responded to the increased risk to continuity of operations from the spread of COVID-19 by requiring critical staff to work across its two operations sites and transitioned the remainder of its workforce to work-from-home arrangements. The transition to remote working was implemented over the weekend of 14—15 March, after a staff member tested positive to COVID-19. While the transition was sudden, ASX had made significant preparations for such a move since initiating its pandemic response plan.

Critical staff working onsite were segregated across distinct teams and operation sites, so that if an infection were to occur at one site, the team at the other site would not be required to isolate. Backups for critical staff were identified, in case any of the onsite teams became infected. To guard against the possibility that operational sites became unavailable, ASX developed plans allowing it to operate critical systems that support the CS facilities on a remote basis. ASX also implemented risk mitigation measures to protect the health and wellbeing of its staff, including the deferral of international travel and increased cleaning of premises.

While these arrangements were necessary to mitigate the health risks associated with the COVID-19 outbreak, they represented a significant change to normal operations that can carry additional operational risks that must be mitigated. For example, the higher-than-usual reliance on technology to support remote working and connectivity to critical systems was mitigated by the frequent review and update of ASX's pandemic response plan and maintaining a limited number of critical staff onsite. ASX also took steps to ensure that cyber security controls continued to operate largely as they did prior to remote working and it monitored key systems for additional vulnerabilities that may arise from the increased use of technology to support remote working.

ASX continues to review and update its pandemic response plan on an ongoing basis to take into account government directives, external developments and lessons learned from its implementation. To date, there have been no service disruptions caused by the transition to remote working arrangements.

2.1.2 CHESS processing delays

On Friday 13 March, CHESS experienced processing delays due to record volumes and a reduction in system performance. Around 7 million cash equities trades were executed across all markets cleared and settled using CHESS. This was more than twice the pre-February peak trading day of 3.3 million trades. ASX deferred end-of-day processing of trades and worked to improve processing times before completing processing on Saturday 14 March. A combination of factors, including ASX's processing delays and a separate operational incident at Chi-X, meant that approximately 119,000 Chi-X trades could not be processed until Sunday 15 March and were excluded from normal netting processes. The fact that the incident occurred on a Friday and ASX was able to continue processing on the weekend, reduced the risk that the delay could impact the opening of markets on the next trading day.

Immediately following this incident, ASIC consulted with the Bank regarding possible responses to manage the risk that CHESS again experienced similar capacity constraints. ASIC then issued a direction capping the trading volumes of the nine largest equity market participants. It revoked this direction in May, instead writing to ask all participants to ensure that the number of trades they place in the market are consistent with their own operational capacity and support the fair and orderly operation of equity markets.[4] In addition, ASX is exploring options to support the fair and orderly operation of markets if a similar increase in volumes were to happen again. The incident in March highlighted the role that global events and extreme volatility can play in driving trading activity in a market with increasing participation from algorithmic and high frequency market traders, and the need for ASX to have a contingency arrangement in place to address extreme increases in volumes that exceed system capacity. ASIC and the Bank are continuing to discuss this situation with ASX.

ASX has commenced a program of work to improve the capacity of its post-trade systems for cash equities. As part of this, it has continued to make further technical improvements to improve the processing speed of CHESS and is planning to implement a number of other upgrades in the second half of 2020. These are expected to add sufficient additional capacity for CHESS to be able to process on a repeatable basis a volume of cash equities trades similar to that observed on 13 March. ASX is also considering further upgrades in 2021 that would significantly increase the capacity of the current system.

This incident highlights the limitations of the CHESS system in quickly responding to extreme increases in the number of trades. While the identified enhancements will improve capacity in the current system, CHESS is built on technology developed in the 1990s that is not easily scalable. In the medium term, ASX plans to implement a replacement system that is expected to be able to process 15 million trades per day at launch and is designed to be more flexible so that capacity can be increased in the future if needed.

Recommendation. ASX should implement the new clearing and settlement system for cash market transactions as soon as this can be safely achieved by ASX and users of CHESS. In the short term, ASX should carry out plans to increase the capacity of the current CHESS system and develop contingency arrangements to address future extreme increases in volumes that exceed current processing capacity.

4 See <https://download.asic.gov.au/media/5591066/20-116mr-letter-to-all-equity-market-participants.pdf>

2.1.3 Reprioritisation

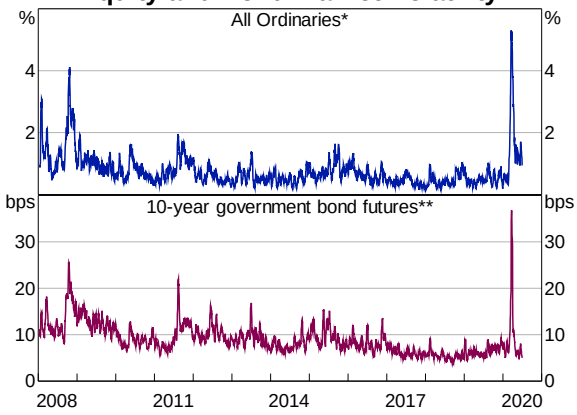
Addressing the operational risk management challenges presented by COVID-19 placed additional demands on the ASX CS facilities. In response, ASX prioritised work to maintain operations and address risks associated with COVID-19, while delaying some work on longer-term projects. In response to market volatility, ASX also prioritised additional analysis and enhancements to key financial risk models (see section 2.2) and re-planned its longer-term roadmap to enhance its clearing risk management systems (see section 3.3.2). ASX will be consulting with its participants on further extending the timelines for its CHESS replacement project (see section 3.3.1).

2.2 Financial Risk

The COVID-19 pandemic presented significant financial risk management challenges for the ASX CCPs. The uncertainty and rapidly evolving information associated with COVID-19 resulted in heightened volatility in financial markets (Graph 1). The 9.5 per cent fall in the All Ordinaries index on 16 March was the highest single-day decline since the index fell 25 per cent on 20 October 1987. Australian dollar interest rate markets have also experienced historically large movements. This extreme market volatility has highlighted the importance of CCPs' financial risk management arrangements (Box B).

Graph 1

Equity and Bond Market Volatility



* 10-day moving average of absolute per cent change
** 10-day moving average of intraday range
Source: Bloomberg

During this time of heightened volatility, the ASX CCPs' financial risk management frameworks generally performed well. The ASX CCPs, both of which have equities as their largest risk exposures, demonstrated resilience and throughout this period of volatility additional steps were taken to strengthen their risk management arrangements. These enhancements were managed successfully by ASX despite the very significant operational challenges presented by remote working; in particular, the very large fall in equities on 16 March occurred on the first day following ASX's transition to work-from-home arrangements. However, some vulnerabilities emerged during the period, including in relation to the CCPs' ability to collect margin in response to late-in-day market price movements, the possible procyclical effects of margin setting changes, and the adequacy of stress test scenarios. These issues are discussed further below.

Box A: CCP financial risk management

In the absence of a participant default, a CCP has no direct exposure to price movements in the products it clears. However, in the event of a default, the CCP would assume the obligations of the defaulting participant – and therefore the risk exposures of its portfolio – until the CCP is able to close out those positions. Heightened market volatility would exacerbate the credit and liquidity risks faced by the CCP in this scenario.

A CCP's first line of defence in managing these risks is to reduce the likelihood of a participant default via stringent participation requirements and ongoing monitoring of capital and liquidity positions.

A second line of defence comes from the collection of margin from clearing participants.

- *Variation margin* is collected to prevent the build-up of exposures as prices move. It is directly linked to current volatility since it reflects changes in the market values of participants' positions.
- *Initial margin* is calibrated to cover possible adverse price changes between the time of a default and when a position could be closed out. Initial margin models are usually calculated using a historical sample of price movements; depending on how this sample is constructed, margin levels may be more or less responsive to the most recent levels of volatility.

Both types of margin are collected either daily or several times per day, depending on the product, either at fixed intervals or in response to significant market movements.

A CCP's third line of defence is its prefunded default fund, which consists of pooled resources contributed by clearing participants and/or the CCP itself. Each CCP operating in Australia seeks to maintain a default fund large enough to cover a default of the two participants (and their affiliates) to which the CCP has the largest exposures in extreme but plausible market conditions – a requirement known as 'Cover 2'. If a CCP's stress tests show that its exposures could breach this requirement then it may collect additional margin as an alternative to increasing its default fund. The Cover 2 requirement is not usually affected by recent levels of market volatility because it is calculated using predefined stress scenarios. However, the scenarios themselves may require adjustment if recent volatility has exceeded these extreme levels.

CCPs may also supplement their prefunded financial resources with other margin requirements – for example, by collecting overnight 'buffer' margin from participants to cover potential overnight price movements if the CCP does not collect variation margin during this period.

If a CCP's losses were to exhaust all of its prefunded resources, the CCP's last line of defence would be to turn to additional recovery tools, which could include allocating residual credit losses and liquidity shortfalls to the CCP's surviving participants.

For specific details on the ASX CCPs' risk management arrangements, see Appendix B.

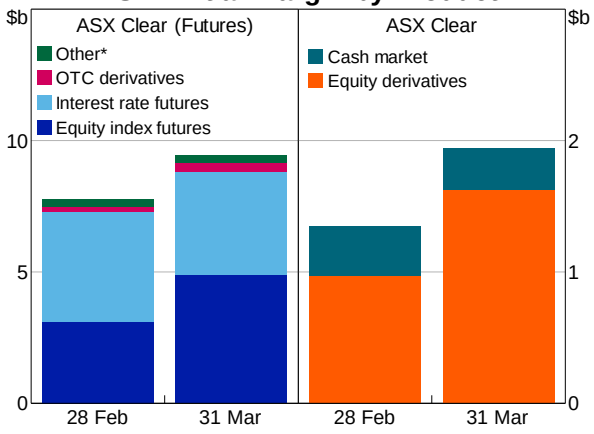
2.2.1 Initial margin

ASX responded to heightened volatility in financial markets by increasing initial margin settings so that the CCPs had additional resources to protect themselves against higher expected future volatility. The largest adjustments were to equities products, with initial margin rates on equity index futures and options increasing from 4.5 per cent to 10 per cent in two stages over March. This was the largest single-month increase ASX has made to equity margin requirements under its current margining approach. The increase was larger than that required by its statistical model, reflecting ASX's judgement that equity market volatility could remain elevated for some time. In May, ASX made further increases to

margin rates for single-stock equity derivatives and to the flat rate applied to less liquid cash equities to reflect the volatility observed over March. In addition, adjustments to the margin settings on over-the-counter (OTC) derivatives resulted in a doubling of margin collected on these products. No changes were made to margin rates for exchange-traded interest rate products following the outbreak of COVID-19. These had already been increased significantly in November to address a low-rate bias in ASX's stress tests (see section 2.2.4) and, unlike equities, yields stabilised quickly after the Bank announced its interventions in the bond market on 19 March.[5]

In aggregate, initial margin collected by ASX Clear (Futures) rose over March from $7.7 to $9.4 billion, while initial margin at ASX Clear rose from $1.3 to $1.9 billion (Graph 2). Nearly all of this increase was due to changes in margin rates for equity derivatives. Despite elevated trading volumes, net participant exposures remained constant or declined across most products. Initial margin subsequently declined to $8.9 billion at ASX Clear (Futures) and $1.5 billion at ASX Clear as at the end of the assessment period.

Graph 2
ASX: Initial Margin by Product



* Includes agriculture and energy futures
Source: ASX

2.2.2 Procyclicality

Increasing margin requirements during periods of market stress can create liquidity challenges for a CCP's participants. Such increases can be considered 'procyclical' if they tend to occur during downturns in the business or credit cycle and may either cause or exacerbate market instability. This risk has been an area of focus among regulators in recent years, and international guidance has encouraged CCPs to put in place measures to maintain higher initial margin requirements 'through the cycle' in order to avoid sudden increases in times of stress. These measures can involve CCPs placing a floor on margin requirements or ensuring – even during periods of low volatility – that their margin calculations always take into account earlier episodes of particular stress.

ASX calculates initial margin requirements for equity index derivatives using a five-year historical sample of price movements; it uses a range of sample periods between 12 months and 12 years for other products. The margin model ASX uses for exchange-traded derivatives requires ASX to regularly review and manually adjust key margin parameters. ASX targets a confidence level of at least

5 See <https://www.rba.gov.au/mkt-operations/government-bond-purchases.html>

99.5 per cent for these parameters. While ASX can choose to keep margin rates at a higher level than the statistical recommendation, it does not have a systematic approach to doing so.

Margin rates for equity derivatives are likely to remain elevated while the latest period of volatility remains in the historical sample and ASX continues to apply a discretionary floor to margin requirements. However, under ASX's current margining approach, margin requirements could again decline following an extended period of low volatility, creating the potential for another sudden increase at the onset of the next period of heightened market volatility. The 2018 Assessment identified ASX's lack of a systematic approach to assessing and mitigating the potential for procyclical changes as a weakness in ASX's risk management framework. ASX has plans in place to implement enhancements to its procyclicality framework in the coming assessment period.

Recommendation. Consistent with the CCP Resilience Guidance, the ASX CCPs should develop a systematic procyclicality framework designed to avoid destabilising increases in margin and other financial risk requirements during periods of heightened market volatility.

2.2.3 Liquidity risk management

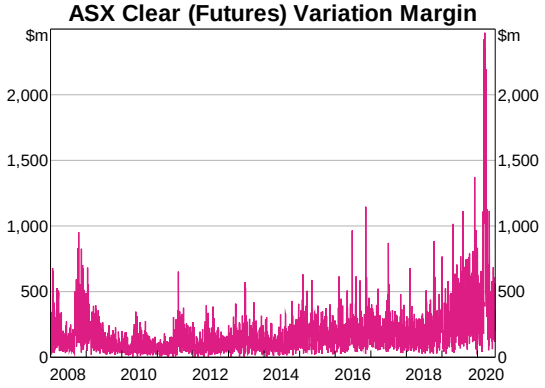
Variation margin calls rose significantly at both ASX CCPs over March and early April due to the elevated market volatility over this period (see Graphs 3 and 4). Daily variation margin calls at ASX Clear (Futures) exceeded the previous historical high of $1.4 billion on 11 occasions, with a maximum of $2.5 billion being called on 16 March. Daily premium margin called from ASX Clear members exceeded the previous historical high of $1.5 billion on four occasions, with a maximum of $1.9 billion called held on 23 March.[6]

While ASX Clear (Futures) calls for margin at a number of points during the day, it does not typically call variation margin between 1.30 pm and 8.05 am the next day.[7] ASX Clear usually only calculates initial and variation margin at 5.00 pm, after market close, for collection at 10.30 am the next day. However, in response to the extreme intraday price moves seen in March, both ASX CCPs made frequent use of an additional, ad hoc intraday margin call at around 2.30 pm. However, the CCPs cannot initiate a margin call that is able to be collected on the same day much later than this; this reflects the time required for ASX to calculate margin requirements and for participants to meet their margin obligations before the closure of Austraclear's day session at 4.28 pm. ASX Clear (Futures) participants that are active during the overnight session are required to post additional collateral to cover potential adverse price movements overnight, in the absence of a variation margin call during this period.

6 'Premium margin' is the term given to margin collected to cover mark-to-market changes in the close-out price of exchange-traded options (ETOs)

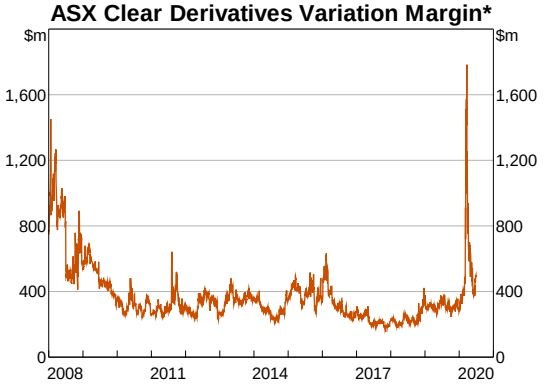
7 ASX Clear (Futures) usually makes three intraday margin calls per day for initial and variation margin at 8.05 am, 11.30 am and 1.30 pm. It also makes an end-of-day call for initial and variation margin at 5.00 pm, which is settled the following morning at 11.00 am. In addition, ASX Clear (Futures) makes an initial margin-only intraday call during the overnight session at 2.00 am and calls AIM between 5.00 and 8.00 am.

Graph 3
ASX Clear (Futures) Variation Margin



Source: ASX

Graph 4
ASX Clear Derivatives Variation Margin*



* ASX refers to margin collected to cover changes in the price of exchange-traded options as 'premium' margin

Source: ASX

Rapid price movements after the last intraday margin run can result in a significant build-up of exposures. In March, ASX Clear (Futures) twice breached its Cover 2 liquidity requirement following large upward movements in equity futures prices between 2.30 pm and 5.00 pm, when ASX calculates its stress test exposures. These price increases generated large variation margin obligations for two participants with sizeable short positions that the CCP would be required to fund if the participants had defaulted prior to the settlement of variation margin the next morning. In addition, ASX's stress test scenarios assume that the CCP would then have experienced further losses from rising equities prices before it could close out the short positions.

Two Cover 2 breaches within a 12-month period exceeds the ASX Board's risk tolerance for the frequency of stress test breaches (see section 3.4.1). ASX's immediate response was to require the two participants that caused the Cover 2 breaches to each post additional overnight liquidity buffer margin of $150 million; this was reduced in early April after increases in initial margin requirements for all participants reduced the likelihood of a further breach. The size of the overnight buffer as applied to all participants was also recalibrated in April with a shorter lookback period to place more weight on the heightened volatility of March and April.

While ASX Clear did not have any Cover 2 breaches, it did have three breaches of its internal cash market liquidity buffer over the assessment period. A breach of this buffer does not indicate an overall shortfall of liquid resources, but it implies that in the event of a Cover 2 scenario there would be a greater reliance on offsetting transaction arrangements (OTAs) as a source of liquidity.[8] The first breach occurred in December, a few days before ASX executed an $80 million committed liquidity facility that would otherwise have prevented the breach. ASX Clear had two subsequent breaches of its internal liquidity buffer in March. In response, ASX Clear initially increased AIM requirements for select participants before introducing a permanent liquidity buffer requirement for participants with large liquidity exposures on derivatives in July.[9]

8 An OTA enables ASX Clear to settle its payment obligations on the intended settlement date with participants due to deliver securities, through an arrangement to offset the underlying settlement obligations to and from those participants via a repurchase agreement with the participants. It provides temporary liquidity until ASX Clear is able to sell the securities subject to the OTA and use these funds to unwind the transaction.

9 ASX Clear's liquidity buffer is calibrated to cover the 75th percentile of changes in the CCP's liquidity exposures from participants' equity derivative positions over a three-month lookback period. It includes a minimum threshold such that it only affects participants with relatively large exposures.

The 2019 Assessment included a recommendation that ASX Clear (Futures) should embed, review and refine its arrangements to monitor and manage intraday exposures during ASX 24's Night Session on a near real-time basis. During the assessment period, ASX implemented an alert at 2 am to identify participants with an initial margin exposure of greater than $100 million. The alert triggers an investigation by ASX to manually validate the size of the initial margin call before it is made on the participant. This complements actions in earlier assessment periods, including the development of a risk-visualisation tool to monitor intraday exposures on a near real-time basis, the implementation of an overnight margin buffer and the introduction of the 2 am overnight margin call.

ASX plans to introduce further enhancements to its management of intraday exposures. These include a project to rebuild its credit stress testing model to enable intraday stress testing and to enhance margin backtesting so that its prefunded resources better capture risks from the potential for rapid price movements late in the day. While these enhancements would reduce the risk that late-in-day or overnight price movements leave the CCPs with an uncovered exposure, the impact of recent market volatility on both CCPs highlights that prefunded resources may not be sufficient if market moves are sufficiently large. ASX does not yet have a developed framework for monitoring variation margin liabilities overnight or to address margin exposures that exceed those covered by initial margin and the overnight margin buffer.

Recommendation. The ASX CCPs should put in place arrangements that allow them to monitor and manage exposures arising from large late-in-day price movements, including movements that exceed the coverage provided by initial and additional margin. For ASX Clear (Futures), this also applies to price movements during the overnight trading session.

2.2.4 Stress tests

The results of a CCP's stress tests directly determine the level of prefunded resources it must hold. Consistent with the FSS, ASX seeks to maintain prefunded resources that would be sufficient to cover its losses from the default of any two clearing participants using a range of 'extreme but plausible' stress test scenarios. It is therefore critical that these scenarios reflect up-to-date information on what may be plausible risks to the CCPs. These scenarios may be based on historical events (e.g. the Lehman Brothers default), hypothetical events (e.g. geopolitical conflict), or theoretical scenarios extrapolated from historical price movements using statistical techniques.

During the assessment period, ASX's historical stress test scenarios for equity index derivatives were calibrated using observed changes in prices at market close over a three-day period.[10] However, this approach does not take into account losses that could arise from more extreme intraday price movements that could occur while a defaulted participant's portfolio is being closed out. In light of this issue, on 6 July ASX revised its calibration of historical stress test scenarios for some key futures contracts so that estimated losses take intraday prices into account.[11]

10 Three days is the maximum amount of time ASX expects it could need to close out a defaulted participant's portfolio in stressed conditions.

11 Under ASX's revised methodology, stress test losses for relevant futures contracts are calculated using the change in price between the worst point of entry (i.e. either the highest or lowest price observed during the day, depending on the direction of the position) and the volume weighted average price observed over either the next two or three days (whichever produces a higher loss).

In response to the volatility observed in March, ASX also reassessed whether the magnitudes of its stress tests remain appropriate. On 6 July, ASX introduced 17 new historical and theoretical stress test scenarios across both CCPs based on price movements observed in March. Several of these scenarios extend the boundary of what ASX had previously considered 'extreme but plausible', including by significantly increasing the largest 'yield-down' shock for 10-year bond futures, increasing the largest upward shock for equity index futures, and introducing more severe combinations of both equity and rates shocks than were previously considered. The Bank is in the process of discussing with ASX how it defines the boundary of 'extreme but plausible', including the governance processes that underpin the determination of this boundary. While ASX has a clear approach to the inclusion of historical scenarios in its suite of stress tests, its approach to formulating hypothetical and theoretical scenarios that are extreme but plausible is less well defined.

The changes outlined above come in addition to a major update to the stress testing methodology for ASX Clear (Futures)' rates products that was implemented in April. The enhancements introduce absolute shocks to interest rates (i.e. assuming interest rates fall by a fixed number of basis points, rather than by a percentage of the current yield). This update was intended to address the low-rate bias in the previous methodology, which implied that the shocks used in stress tests became smaller as rates fell. ASX had planned to make these changes prior to the COVID-19 outbreak and accelerated implementation in light of the decline in yields in early March.

2.3 Participant Risks

ASX did not experience a participant or client default at either CCP during the assessment period. ASX's monitoring of participants across both CCPs indicated that most maintained strong capital positions and adequate liquidity. Most of the risk at ASX Clear (Futures) is concentrated in the large domestic and international banks, while ASX Clear has a greater number of participants (including smaller brokers) and the risk is slightly less concentrated. During the period of market stress brought on by COVID-19, ASX Clear received capital returns from all non-bank participants to check compliance with its capital requirements and received daily liquidity returns from smaller participants to assess their capacity to meet margin calls. ASX Clear (Futures) has also been collecting more frequent data on the liquidity position of some of its larger members, in order to gain more timely insight into the potential build-up of liquidity pressures at those participants.

Participants in the ASX CCPs did not experience any significant operational issues from working-from-home arrangements or fail to make any margin payments.

2.4 Default Management

The risks of a participant default have been heightened during the COVID-19 pandemic: participants have been exposed to additional credit and liquidity stresses arising from volatility in financial markets, and in the medium term may be exposed to the economic impact of a prolonged shutdown. There have also been potential operational complexities arising from the ASX CS facilities and their participants working remotely or operating under business continuity arrangements. These complexities could make it more difficult to liquidate a defaulting participant's portfolio and contain losses if any participants of the ASX CS facilities were to default.

ASX reviewed its preparedness to manage the default of a participant in response to the COVID-19 pandemic, including by testing that key default management systems could be accessed remotely. In addition, ASX tested its arrangements and established that all external dependencies for default

management were unaffected even though a number of default brokers and financial institutions had also activated their business continuity plans. As a result, ASX is confident of its ability to manage a default with all staff working remotely, notwithstanding that such an arrangement would be less efficient in some circumstances and it would therefore seek to bring some additional staff in its office where it could.

A default involving an OTC derivatives portfolio would create an additional challenge. It may not be possible for ASX to follow its standard default management approach, which requires an in-person meeting of its participant Default Management Group (DMG) within two hours. ASX has therefore developed contingency plans allowing it to hedge the defaulter's portfolio and proceed directly to an auction without input from the DMG.

Further information on ASX's default management arrangements is provided in chapter 4.

2.5 Conclusions

The COVID-19 pandemic presented significant operational and financial risk management challenges for the ASX CS facilities, including disruptions to their normal working arrangements, large increases in transaction volumes and heightened volatility on financial markets. Each of these issues in isolation would have represented serious risk management challenges. The combination of these issues and the protracted nature of the crisis further exacerbated the challenge.

Within this context, the ASX CS facilities performed very well in most respects. ASX successfully activated pandemic plans and transitioned to remote working arrangements within a short period of time, without any interruption to its critical operations. The CCPs also demonstrated resilience during a time of heightened volatility, particularly in equity markets, managing the risks associated with the largest single-day decline in equities for over 30 years on the first day following the transition to remote working. The post-GFC regulatory reforms also ensured that CCPs and their participants entered the current crisis better capitalised and with greater liquidity buffers than was the case in 2008. Nevertheless, developments surrounding COVID-19 highlighted some areas of vulnerability for the ASX CS facilities that will inform the Bank's supervisory engagement over 2020/2021.

The Bank will continue to engage closely with ASX on other matters related to the COVID-19 crisis over the coming assessment period. This will include monitoring the arrangements that ASX has in place to address a possible escalation of the situation, its preparations for incident or default management, and the steps it is taking to monitor the credit and liquidity position of its participants.

3. Other Material Developments

This section discusses material developments relevant to the ASX CS facilities that have occurred during 2019/20. Developments between the end of 2019/20 and the finalisation of this report on 2 September are also discussed, where relevant. To complement this section, background information on activity and participation in the facilities, and governance and risk management in the facilities is set out in Appendix B.

3.1 Progress against Recommendations and Areas of Supervisory Focus from the 2018/19 Legal Basis Special Topic

3.1.1 General business risk

As part of the special topic on ASX's legal basis, the 2019 Assessment recommended ASX ensure that business, operational and investment risk capital is available to the ASX CS facilities when required, even when the financial standing of the ASX Group entities holding this capital (ASX Operations Pty Limited and ASX Limited) is in doubt. This was intended to address the gap that the ASX Group Support Agreement included no provision that safeguards the CS facilities' access to this capital if ASX Limited or ASX Operations was to become insolvent. ASX has taken steps to address this recommendation by transferring some of the capital previously held at ASX Operations to be held directly at the CS facilities.

ASX has made two associated changes to its arrangements for holding business, operational and investment risk capital.

- ASX Operations previously held $75 million in capital to cover investment risks across both CCPs. This reflected that the CCPs' cash margin and default fund contributions are invested in a common pool. ASX has transferred $66 million of this capital to ASX Clear (Futures) and $9 million to ASX Clear, reflecting the average contribution of each CCP to the common investment pool since July 2018. ASX has indicated that the CCPs would use their retained earnings to cover a shortfall if the actual proportion of a CCP's contribution to pooled investments differed from this average ratio on the day an investment loss occurred. However, if this approach had been in place prior to June, retained earnings would not always have been sufficient to cover shortfalls in investment risk capital at ASX Clear. While the shortfalls were relatively small, ASX does not currently have a mechanism to minimise the likelihood of a shortfall arising.
- ASX continues to apply its existing methodology in determining the total amount of business risk capital set aside for the SSFs across the group. This methodology applies a percentage charge to the value of securities held at each SSF.[12] As at 30 June 2020, ASX has split the business and operational risk capital that was previously held by ASX Operations in respect of the SSFs between a core amount transferred to each SSF ($25 million to ASX Settlement and $20 million to Austraclear), and a buffer of $143 million that will continue to be held by ASX Operations. The core

12 ASX assumes that the two facilities will not both require their full risk funds at the same time, so applies the 'square root of the sum of squares' formula in calculating the total amount of capital set aside across the group.

business and operational risk capital has been calculated using the same methodology as that used to calculate the CCPs' capital requirements, including provisions for operational and legal risks, business risk and the cost of funding the SSF's recovery or wind-down plans. While the new methodology is consistent with the level of capital that the SSFs are required to hold under SSF Standard 12, the ASX and CS Boards have not yet amended their policy governing the amount of capital that is to be held at the SSFs to reflect the new arrangements. While any transfer of capital back to ASX Operations would require Board approval, such a transfer would be permitted under the current policy. An amended policy would also provide a mechanism for ASX to review whether the level of capital held at the SSFs remains appropriate over time.

The Bank will conduct a more comprehensive review of the ASX Group Support Agreement in the next assessment period.

Recommendations. The ASX CCPs should hold an additional capital buffer to cover potential shortfalls in investment risk capital at each CCP. ASX should establish a process to periodically recalibrate the split of capital held by each CCP and make any necessary adjustments to the buffer.

The Boards of the ASX SSFs should formally establish an appropriate methodology for determining the level of business and operational risk capital held at each SSF and ensuring the level of capital remains appropriate over time.

3.1.2 Other recommendations and areas of supervisory focus

The 2019 special topic also set out four recommendations relating to the Legal Basis Standard.

- *Designation in New Zealand (NZ)/repatriation of NZD collateral*. The 2019 special topic review resulted in ASX identifying an additional legal risk relating to a small number of participants that participate in ASX Clear (Futures) via an Australian branch, but also have a branch in New Zealand. If one of these participants was to enter insolvency, then it is possible that a New Zealand court could take action that interferes with ASX Clear (Futures)' rights over any NZD collateral posted by the participant. In order to mitigate this risk, ASX Clear (Futures) progressed its application for designation as a settlement system, which it was granted on 14 August. Designation provides ASX Clear (Futures) with additional settlement finality protections under the *Reserve Bank of New Zealand Act 1989* (RBNZ Act). ASX has also developed a procedure supporting the repatriation of NZD collateral to Australia upon a participant default, where the stronger protections of the *Payment Systems and Netting Act 1998 (PSNA)* would apply.
- *Enhance legal certainty of default management actions*. On 6 July 2020, ASX implemented changes to CCP operating rules to enhance the legal certainty of default management actions. The CCPs' Operating Rules previously did not explicitly authorise the offsetting of opposing positions held by two or more participants that have defaulted at the same time, which may be a preferred default management strategy in an extreme event such as this.
- *Update procedures governing legal opinions*. The 2019 Assessment identified that ASX's processes and procedures governing the commissioning, reviewing and updating of legal opinions were not sufficiently comprehensive. During the assessment period, ASX established guidelines governing the commissioning, reviewing and updating of legal opinions. ASX plans to finalise enhancements

to these guidelines in the coming assessment period taking recent feedback from the Bank into account.

- *Establish a periodic review of operating rules and procedures*. The 2019 Assessment recommendated that ASX periodically review the CS facilities' operating rules and procedures to ensure these are clear and understandable and consistent with industry standards and market protocols. ASX plans to commence work on this in the coming assessment period.

The 2019 Assessment also set out an area of supervisory focus on ASX's business-as-usual controls for legal risks. During the assessment period ASX has implemented a number of enhancements to its controls, however ASX intends to conduct further work to document requirements for legal input in business processes.

Recommendations. The ASX CS facilities should take the following steps to strengthen their legal basis:

- review and update processes and procedures governing the commissioning, reviewing and updating of legal opinions
- establish a periodic review of operating rules and procedures for all CS facilities to be carried out at least every five years to ensure they are clear and understandable and are consistent with industry standards and market protocols.

3.2 Building Stronger Foundations

In 2018, ASX commenced its Building Stronger Foundations program (the Program) to address the findings of an independent external review of ASX's technology governance, operational risk and control frameworks (the Review). The Program also incorporated ASX initiatives and projects to improve enterprise risk management and governance practices that had been identified prior to the Review. The Review was conducted by KPMG at the instigation of the Bank and ASIC, identifying 36 recommendations to address gaps identified in ASX's risk management, technology governance, enterprise architecture and incident management.

During the assessment period, ASX closed the Program having substantively completed implementation of the Review's 36 recommendations. Residual deliverables will be completed in 2020 outside the Program as part of ASX's three-year Enterprise Risk Management (ERM) plan. ASX Internal Audit commissioned a review (carried out by KPMG) to assess how well the foundational elements that were implemented early on in the Program have been embedded in practice. The review concluded that there has been a clear effort by ASX to support and mature the foundational improvements delivered by the Program. ASX Internal Audit intends to carry out a similar review on additional elements of the Program in the next assessment year.

The 2019 Assessment recommended that the ASX CS facilities complete a number of the actions planned as part of the Program in order to fully observe requirements of the FSS relating to Governance (CCP and SSF Standard 2) and Operational Risk (CCP Standard 16 and SSF Standard 14). Sections 3.2.1 to 3.2.4 summarise the progress made by ASX in addressing the Bank's recommendations.

3.2.1 Risk management

Embedding risk appetite

The 2019 Assessment recommended that ASX CS facilities should complete implementation of plans to embed their risk appetite in business processes and decision-making throughout the organisation. During the assessment period, ASX completed development of business-unit level KRIs that provide a more detailed breakdown of the Board-level KRIs established in the previous assessment period. The relevant KRIs are monitored by business unit management on a quarterly basis and feed into the quarterly reports to the Chief Risk Officer (CRO), Chief Operating Officer and to the executive-level Risk Committee, the CS Boards and the ASX Limited Board Audit and Risk Committee (ARC). ASX also updated its processes to incorporate broader consideration of risk in its decision-making across key projects. For instance, ASX implemented a framework to record and follow up challenges made by the central risk oversight function (second-line risk management) in respect of each business unit's (first-line risk management's) approach to risk management.

During the previous assessment period, ASX updated its risk appetite statement to incorporate its new Board-level KRIs and more detailed categorisation of its risks. As part of its annual review, ASX further refined the descriptions and tolerance thresholds of the Board-level KRIs to incorporate learnings from its implementation of the Program, the implementation of its pandemic response plan and other emerging risks.

Improving first-line risk ownership and risk culture

The 2019 Assessment included a recommendation that the ASX CS facilities should complete implementation of plans to improve first-line risk ownership. During the assessment period, ASX continued the roll out of initiatives to assess and improve ASX's risk culture, including staff surveys on risk culture and a program of seminars inviting external guest speakers to share industry practices on assessment and improvement of risk culture. The Internal Audit review found that these initiatives increased ASX staff awareness of the three lines of defence model and increased discussion of risk and controls.[13] ASX also operates a program of mandatory e-learning for all staff that encompasses a variety of risk topics, including three lines of defence, incident management and fraud. ASX has also instituted a program of risk updates to the ASX executive Risk Committee and ARC from each business unit. These updates capture first-line views of current and emerging risks, risk controls, breaches, incidents and updates on risk culture and leadership. ASX expects to complete these presentations across all business units in the next assessment year.

Operational risk measurement and monitoring

The 2019 Assessment recommended that the ASX CS facilities should complete development of a consistent enterprise-wide view of systems, policies, procedures and controls to identify, monitor and manage operational risks. During the assessment period, ASX completed the build and roll-out of an IT Service Management (ITSM) tool (see section 3.2.4) and an Enterprise Risk, Internal Audit and Compliance Application (ERICA), which allows it to capture, consolidate, analyse and report risk, compliance and audit data on a more consistent basis. Consolidated risk dashboards produced in ERICA

13 Under the three lines of defence model, the first line is risk management within the business functions themselves; the second line is an independent risk management and compliance function that develops risk management policy and oversees risk management in the first line; and the third line is independent assurance (i.e. internal and external audit).

outline ASX's key risk areas across business units and feed into quarterly CRO and COO reports to the ASX Board. The Internal Audit review found that the implementation of ERICA has achieved risk reporting in line with objectives of the Program and that it has been effective in highlighting risk areas.

As part of ASX's three-year ERM plan, ASX will continue to embed the use of ERICA as a tool for risk monitoring, reporting and providing insights and analytics across its business units. ASX expects that the benefits of ERICA will be more fully realised in the coming assessment period as a richer history of risk and compliance data is built up and there is a longer period to assess its use in analysis and reporting key risk metrics.

3.2.2 Technology governance

The Review recommended that ASX define a technology strategy and roadmap that provide an overarching vision of the IT function. ASX refreshed its technology strategy and introduced a new technology operating model during the previous assessment period. During the current period, ASX introduced further improvements focused on project governance, including a framework to monitor the benefits realised from a project post-implementation and to better consider risks across all of ASX's projects.

The Internal Audit review found that governance committees established in recent years to oversee technology and operations matters have clearly defined terms of reference, memberships, responsibilities, and capture the relevant technology risks, risk definitions and supporting data. This includes a process by which relevant KRIs are discussed at technology governance committees, including the Technology Operations and Security Committee, and presented to the ARC for noting.

3.2.3 Enterprise architecture

The Review identified that a contributing factor to ASX's absence of an overarching IT strategy was that ASX lacked a true end-to-end view of its IT architecture (i.e. its enterprise architecture). During the previous assessment period, ASX established an enterprise-level 'Design Authority' intended to ensure that governance and decision-making over IT projects takes into account the broader system architecture. The Internal Audit review assessed the appropriateness and maturity of ASX's enterprise architecture function. It found an increased level of capability in the function and that its scope and influence in planning are well defined and understood in the organisation. The review also found that the introduction of a central Design Authority supported more transparent decisions on architecture issues across the organisation and allowed ASX to better align the implementation of its technology operating model with its enterprise architecture principles and strategy.

3.2.4 Incident management

During the assessment period, ASX implemented the second phase of its new ITSM tool. The tool is intended to support ASX's management of incidents and problems and provide a centralised repository of key system information. It includes a series of well-defined steps with real-time dashboards to manage incident, asset and change management functionality and has now been implemented across all of ASX's business units. The tool is integrated with ASX's crisis management communication system and acts as a single source of truth by providing an end-to-end view for a majority of its infrastructure assets, thereby lessening the reliance on its subject matter experts. ASX is also using the tool to automate the process of mapping its assets and services for identifying issues in related systems and

processes. ASX expects to realise more benefits with the improvement in the quality of incident data as the tool is used over a longer period.

3.2.5 Conclusions and recommendations

The actions described in sections 3.2.1 to 3.2.4 represent significant progress towards addressing the recommendations related to the Review and Program in the 2019 Assessment. The Program has substantially improved ASX's consideration of risk appetite in its business processes and decision-making, and the involvement of the first line in risk management, although ASX will continue to implement improvements in these areas as part of its three-year ERM plan and ongoing strategy. While the Program has put in place the necessary systems (such as ERICA and the ITSM tool) and processes to identify, monitor and manage operational risks, more time is needed to assess the effectiveness of these systems and processes in practice.

Recommendation. The ASX CS facilities should continue to embed the use of new systems and processes supporting change management, incident management and knowledge management, and use these systems to identify, monitor and manage operational risks at an enterprise-wide level. ASX internal audit should independently review the effectiveness of these systems and processes in practice.

3.3 Operations and Technology

3.3.1 CHESS replacement

During the assessment period, ASX continued its work on replacing CHESS, its core system for clearing, settlement and other post-trade services for the Australian cash equity market. Although the current system has generally been performing well, with 100 per cent system availability since early 2018, the software was developed more than 25 years ago and is harder to maintain and less flexible than contemporary software. This was highlighted when a large increase in trading volumes on 13 March resulted in settlement processing being delayed and completed over the subsequent weekend (see section 2.1.2).

ASX commenced a process of evaluating replacement options for CHESS in 2015. In 2017, it selected Digital Asset (DA) as the vendor for the distributed ledger technology-based (DLT-based) platform that will replace CHESS. ASX and DA subsequently partnered with VMware, a large US-based technology firm. Under this arrangement, VMware is responsible for designing the ledger component of the new system, leaving DA to focus on delivery of the application layer.

ASX's use of DLT in the CHESS replacement system differs significantly from the use of such technology in systems such as Bitcoin. It will operate a private, permissioned network application of DLT and will determine access to the network through a trusted network of nodes. ASX will be the only entity that can write to the ledger and it will provide access to users, allowing each to see elements of the ledger relevant to them. Participants will be able to connect to the system either by taking a node or by using an ISO 20022 message-based protocol.

The Bank is working closely with ASIC, the Australian Competition and Consumer Commission (ACCC) and Treasury (the agencies) to oversee the CHESS replacement project.

Go-live delay

During the assessment period, ASX identified the need to extend the timeline of the CHESS replacement project. The decision was influenced by the uncertainty associated with the COVID-19 pandemic, feedback from stakeholders that they had insufficient time to prepare for implementation, and the need for ASX to complete aspects of its own readiness, such as software development and testing. ASX also extended the timeline for consultation on operating rule changes that support the new system.

ASX undertook a detailed re-planning process to develop the new timeline. Early in this process, the agencies discussed with ASX their expectations that the new timeline should incorporate previous stakeholder feedback and lessons learned from the project, adequate contingency for events that may cause a further delay and sufficient time for users to complete readiness activities. The agencies also communicated to ASX that it should consult a broad range of stakeholders on the new timeline.

Consistent with these expectations, in July ASX consulted on a revised plan to launch the new system in April 2022. ASX also commissioned EY to conduct an independent review of the revised plan to provide assurance to its Board and demonstrate how the process has addressed the agencies' expectations. The ASX Limited Board will consider the results of the consultation and the independent review before finalising the new timeline.

The importance of replacing the current system has been highlighted by the processing delays in March associated with increased trading volumes (see section 2.1.2). While it is critical that the new system be delivered in a safe and reliable manner, on a timeline that ASX and the users of CHESS can meet, any unnecessary delay to delivery carries risks to the continued stability of the current system. The Bank and the other agencies are closely monitoring ASX's progress in meeting its revised timeline for CHESS replacement.

Key areas of supervisory engagement

The Bank is closely coordinating its engagement with ASIC, as co-supervisor of ASX, as well as the other agencies overseeing CHESS replacement. The Bank's supervisory engagement is particularly focused on: the operational resiliency of the new system; understanding how the new business requirements align with the requirements in the FSS; how the new system can support ASX's risk management capabilities; and ASX's approach to the transition and cutover to the new system. These are described in more detail below.

Operational resilience

CHESS supports two systemically important CS facilities: ASX Clear and ASX Settlement. Operational resilience of the CHESS replacement system is critical for the functioning of these CS facilities and Australian equity markets more broadly. In light of this, ASX has specified a range of 'non-functional' business requirements that address the operational risk management requirements in the FSS.

- *Availability.* ASX's target is for the new system to be available 99.95 per cent of the time during operating hours. This exceeds the current CHESS target of 99.8 per cent availability.
- *Recovery.* ASX will require that the new system is recoverable (without data loss) within two hours where there has been a serious failure. ASX will target recovery from a single component failure within 5 minutes and recovery within 30 minutes of any interruption to batch settlement.
- *Performance and scalability.* ASX will target the new system to have a minimum of 100 per cent capacity above the peak daily volume in CHESS. The new system is designed so that ASX can

both adjust the performance of the nodes used to process transactions and increase the number of nodes (i.e. it will be vertically and horizontally scalable, although there are limits to scalability in some processes such as netting).

- *Information security.* ASX will require that all messaging and node access channels between ASX and users are protected by strong authentication and encryption so that users only ever receive data they are entitled to receive.

The DLT-based system architecture of the new system incorporates several features that are expected to provide additional resilience compared to the current CHESS system. For example, transactions will be confirmed by a network of seven ASX-controlled nodes across four geographically separated data centres. If one data centre was incapacitated then the remaining nodes could continue confirming transactions with no interruption to operations. If two or three data centres were incapacitated ASX will have the ability to recreate the lost nodes in order to resume operations. Under the current system, the loss of the server supporting the CHESS database would result in an operational outage while the system moves to the back-up sever.

The Bank expects ASX to demonstrate that the CHESS replacement system is operationally resilient before going live. This will include ASX providing external assurance that the 'non-functional' business requirements outlined above have been met.

New functionality

ASX consulted on the new functionality for the replacement system in 2018. Since the original consultation, ASX has removed a number of the more complex new business requirements from the day-one release in response to stakeholder feedback, including the optional early settlement of trades and auto-borrowing of securities to prevent settlement failures. Both of these features would have required the introduction of a securities lending facility that could have required additional risk management actions by ASX. The Bank will continue to assess whether the remaining functionality aligns with the requirements in the FSS.

Risk management enhancements

ASX is designing the replacement for the CHESS system so that it can support enhancements to ASX's risk management capabilities, consistent with the Bank's expectations. For example, the new system will allow ASX Clear to calculate intraday margin requirements for cash equities more easily. The new system will also enable the development of new account structures that segregate a client's cash equities positions and collateral from those of the participant during the period between trade and settlement. Currently all client and house trades are held in a single commingled account during this period. The 2019 Assessment recommended that ASX conduct an assessment of whether the protections from arrangements using the current commingled house/client account structures remain materially equivalent to those provided by omnibus or individual client segregation, and consult with the Bank on this within 12 months of the CHESS replacement going live. As part of this assessment, ASX is expected to consult industry on the impact of different client segregation operating models.

Recommendation. ASX Clear should conduct an assessment of whether the protections from arrangements utilising a commingled house/client account structure remain materially equivalent to those provided by omnibus or individual client segregation. ASX should consult with the Bank on the outcome of this assessment within 12 months of the CHESS replacement system going live.

Transition and cutover

ASX plans to transition to the new system using a single cutover weekend, which it has assessed as the least operationally complex and lowest risk option. ASX believes a phased approach to implementing the new system would introduce additional operational risks and temporarily reduce netting efficiencies because each user would be required to run parallel production systems and separate settlement processes for securities held in each system. The agencies will be closely monitoring how ASX manages the risks associated with its transition and cutover to the new system.

3.3.2 Risk systems

In order to support timely implementation of risk management system enhancements, during the previous assessment period ASX implemented a number of changes in ad hoc systems that sit outside of its core systems. This was done because, in some cases, ASX's core systems lack the capability to implement more sophisticated risk management techniques. At the time, ASX had a longer-term aspiration to ensure that all risk management functionality operated in core systems, but it did not have a defined plan to achieve this. The Bank's 2019 Assessment therefore recommended that ASX should establish a long-term plan to ensure that its core systems have the functionality to fully support its risk management approach, including by migrating risk management systems currently operated on non-core systems to core systems.

ASX has established a five-year strategic roadmap for its risk management systems that includes actions to address this recommendation. Under this plan, a rebuild of ASX's credit stress testing systems is due to be completed in 2021. The enhanced credit stress testing systems will support the introduction of a range of risk management enhancements, such as functionality that would enable intraday stress testing.

Recommendation. The ASX CCPs should implement plans to ensure that their core systems have the functionality to fully support their risk management approach, including by migrating processes currently operated on non-core systems to core systems.

3.3.3 Secondary data centre

During the assessment period, ASX substantially completed the migration of its secondary data centre. The new data centre is fully operational with the majority of ASX's key systems operating out of the new site. All physical and virtual infrastructure and transmission network connectivity has been migrated and the majority of connections to customer sites have also been migrated. ASX expects to complete the relocation exercise in the second half of the year.

3.3.4 Cyber enhancements

During the assessment period, ASX made further enhancements to its cyber security practices in line with actions set out in its Cyber Strategy. This included the implementation of measures to comply with mandatory SWIFT Customer Security Program requirements and participation in industry forums such as the CPMI-IOSCO industry working group on cyber. ASX also obtained independent expert reviews to confirm the effectiveness of key elements of its enhancements. In line with expectations set out in the CPMI-IOSCO *Guidance on Cyber Resilience for Financial Market Infrastructures* (the Cyber Resilience

Guidance), ASX continued to evaluate current and emerging technology that could lead to further enhancements in ASX's capabilities to recover its operations safely within two hours following an extreme cyber attack.[14]

3.4 Clearing Risk Management

3.4.1 Credit and liquidity risk

Cover 2 KRIs

The 2019 Assessment included a recommendation that ASX Clear and ASX Clear (Futures) should formalise thresholds for the frequency and magnitude of Cover 2 stress test breaches that would result in a recalibration of the overall default fund or AIM buffer. In March 2020, the CS Boards approved KRIs that establish an explicit risk appetite for credit and liquidity Cover 2 stress test breaches and formalise reporting arrangements to the CS Boards.[15] The new framework allows for one breach of less than 5 per cent of the default fund over a 12-month rolling period before ASX's risk appetite is exceeded. Any Cover 2 breach larger than 5 per cent of the default fund would also immediately exceed ASX's risk appetite. The KRI framework requires ASX staff to report to CS Boards on the causes of any Cover 2 breach, including a smaller one-off breach, and propose mitigating actions in the event that the number and magnitude of breaches exceeds ASX's risk appetite.

3.4.2 Margin

ASX Clear (Futures) ICC methodology

The 2019 Assessment included a recommendation for ASX Clear (Futures) to review its methodology for calibrating ICCs used in its margining model and resume reviews of ICCs on a regular basis. ICCs allow for a reduction in initial margin requirements where offsetting positions are held in correlated contracts. Margin offsets on electricity products played a role in losses sustained in the default of a clearing participant at Nasdaq Clearing AB, a Scandinavian CCP, in September 2018. Following this default, ASX reduced the range of ICCs available for electricity contracts at ASX Clear (Futures). During the assessment period, ASX completed a review of its ICC methodology across the spectrum of products cleared by ASX Clear (Futures). The review concluded that changes could be made to the methodology, but the impact of the changes was small (in aggregate they implied a less than $25 million change in initial margin). In light of the low materiality of potential changes, reprioritisation of work following the COVID-19 outbreak and potential longer-term changes to its margin methodology that could remove the need to set ICCs, ASX concluded that no action should be taken. ASX plans to review on a quarterly basis whether the impact of implementing a revised methodology remains small.

Recommendation. ASX Clear (Futures) should complete its analysis of the costs and benefits of changing its ICC methodology and, if no change is justified, resume regular reviews of ICCs under its current ICC methodology.

14 The CPMI-IOSCO Guidance on Cyber Resilience for Financial Market Infrastructures is available at < https://www.bis.org/cpmi/publ/d146.pdf>

15 A Cover 2 breach occurs when a CCP's stress tests indicate that its prefunded financial resources would be insufficient to cover the default of the two participants (and affiliates) to which the CCP would have the largest credit or liquidity exposures in extreme but plausible market conditions.

Liquidity add-ons

The 2019 Assessment included a recommendation for ASX Clear to implement a margin add-on that accounts for liquidity risk in cash market products and products margined using the CME SPAN model. ASX is currently assessing whether there is a case for developing a liquidity add-on methodology for ETOs and cash equities.

Recommendation. ASX Clear should complete its review of add-ons to manage liquidity risk for cash market products and products margined using the CME SPAN model. ASX Clear should implement these add-ons if the review concludes they are needed.

Box B: Progress implementing CCP Resilience Guidance

In July 2017, CPMI-IOSCO published the CCP Resilience Guidance, which provides further guidance on the *Principles and Key Considerations in the Principles for Financial Market Infrastructure* (PFMI) regarding financial risk management by CCPs. At the time the CCP Resilience Guidance was published, the Bank noted that it would take this guidance into account in its interpretation of the FSS. In its 2018 Assessment, the Bank reviewed the ASX CCPs' practices against the CCP Resilience Guidance and concluded that they were either consistent or broadly consistent with that guidance.

To achieve full consistency with the CCP Resilience Guidance, the ASX CCPs established a multi-year work program to address recommendations and other minor gaps identified by the Bank in its 2018 Assessment. As part of its reprioritisation in response to the COVID-19 pandemic and the turnover of key staff, ASX has conducted an exercise to re-plan this work program and extend delivery dates. This box summarises the key work ASX completed during the assessment period.

In March 2020, ASX Clear (Futures) implemented a revised methodology for calculating stress test losses for certain futures contracts, including equity index futures, 3-year and 10-year Treasury bond futures, and 90-day bank accepted bill futures (see section 1.2.4). This approach incorporates possible losses from intraday price movements in its historical and theoretical stress scenarios. ASX also introduced 17 new historical and theoretical stress test scenarios across both CCPs based on price movements in equities and rates products observed in March.

ASX established a formal process to review whether assumptions made in stress tests remain consistent with the legal frameworks under which the ASX CCPs operate.

In March 2020, the CS Boards approved KRIs that ensure a review of relevant aspects of the CCPs' risk management framework is initiated immediately after a Cover 2 breach (see section 2.4.1).

In August 2019, ASX introduced a requirement to conduct an annual benchmarking exercise for the ASX CCPs' risk models in which alternative models are evaluated and considered.

ASX made changes to its governance arrangements so that the CS Boards now have ultimate responsibility for ensuring that there is an independent validation of stress testing and margin models on an annual basis. Members of the CS Boards are also given an opportunity to review and challenge ASX's response to findings from independent model validation exercises.

Recommendations. To align financial risk management practices and governance arrangements with the CCP Resilience Guidance the ASX CCPs should continue to implement plans to:

- enhance the comprehensiveness of stress testing to ensure risks are appropriately identified, captured and stressed
- enhance analysis and justification of assumptions used in stress testing models so that risks are adequately captured
- remove the assumption made by ASX Clear that excess collateral will not be withdrawn or decreased during periods of stress to more accurately reflect the extreme but plausible conditions appropriate for stress testing
- ensure that roles and processes in relation to the governance of financial risk management are appropriately formalised and documented in order to ensure that the CS Boards have sufficient information to effectively oversee the CCPs
- ensure that their arrangements for disclosure to, and soliciting feedback from, stakeholders cover all relevant aspects of the CCPs' risk management frameworks, including margin sensitivity analysis, reverse stress testing and management of procyclicality.

3.4.3 ASX Clear collateral concentration limits

Following its 2018 assessment of the supervision, oversight and resolution planning of Australian FMIs, the IMF made a recommendation that ASX should apply concentration limits to equity collateral provided to meet margin obligations at ASX Clear.[16] During the assessment period, ASX conducted a study of concentration risk in equity collateral. The study found only a small number of instances where a participant's collateral posted exceeded certain concentration thresholds. In each instance, either the amount of collateral required was less than the concentration threshold or the account had posted sufficient excess collateral that ASX judged it would be able to cover its exposure in a default scenario without crystallising concentration risk. ASX plans to share this analysis with the Bank in the next assessment period and plans to monitor changes in collateral concentration risks on at least a monthly basis. The Bank intends to keep this area of supervisory focus open until ASX has shared its analysis with the Bank and the Bank is satisfied with the conclusion that concentration limits for equity collateral are not necessary.

3.4.4 Stress test exposure limit methodology

In March 2020, the ASX CCPs implemented a new methodology for the calculation of participant stress test exposure limits (STELs). A STEL is imposed on each participant to limit the exposure of the default fund to losses from any single participant. Any stress test exposure that exceeds a participant's STEL will result in a call for stress test AIM. The new methodology allows for greater flexibility in the use of external credit agency ratings in setting STELs. It provides an analytical link between the implied probability of default from external ratings and a participant's STEL, and allows ASX to make adjustments to any rating to account for other qualitative and quantitative factors that could impact creditworthiness. For entities that do not have an external credit rating, ASX has developed a model that assesses creditworthiness and assigns a STEL using a broad range of information, including

16 For more information, please see Box B in the 2018/19 ASX Assessment, available at <https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/clearing-and-settlement-facilities/assessments/asx/>

measures of business risk, asset quality and profitability. ASX's previous approach focused solely on these participants' net tangible assets (NTA).

3.5 Other Developments

3.5.1 Cross-border regulatory developments

Brexit

Following the United Kingdom's (UK) exit from the European Union (EU) on 31 January 2020, the UK entered a transition period that is due to end on 31 December 2020. During this transition period, EU law will continue to apply to the UK under the terms set out in the Withdrawal Agreement Act. In March 2019, ASX submitted applications to the Bank of England (BoE) for both ASX CCPs to maintain recognition in the UK after the end of the transition period. The BoE subsequently added both ASX CCPs to a provisional list of entities that will enter a Temporary Recognition Regime that will begin at the end of the transition period and allow CCPs to continue providing clearing services in the UK for three years thereafter while their formal applications for recognition are being assessed. If required, HM Treasury may also extend the Temporary Recognition Regime by increments of up to 12 months.

New Zealand

On 14 August 2020, ASX Clear (Futures) was granted designation as a Designated Settlement System in New Zealand. Designation provides additional protection for the finality of ASX Clear (Futures)' settlements in New Zealand, addressing risks to the finality of settlements identified in respect of participants that operate a New Zealand branch. ASX Clear (Futures) will also be subject to oversight by the RBNZ and the New Zealand Financial Markets Authority. The New Zealand Government has introduced a bill into parliament to enhance the oversight regime for FMIs which, if legislated, would provide the RBNZ and the New Zealand Financial Markets Authority with additional regulatory powers that apply to designated FMIs. These powers include the ability to set regulatory standards for designated FMIs, powers to oversee their rules, investigative and enforcement powers and crisis management powers.

4. Special Topic – Default Management and Recovery

4.1 Background

CS facilities play a key role in managing post-trade risks in financial markets, including in the event of a participant default. Under normal conditions, CCPs operate a 'matched book' in which their exposures to any one participant are offset by equal and opposite exposures to others. In the event of a clearing participant default, a CCP assumes the obligations of that participant, and therefore the risk exposures of its portfolio. Until the defaulting participant's positions are closed out, a CCP must meet its outgoing obligations (such as variation margin payments) without being able to rely on incoming payments from the defaulter. A CCP therefore needs to be able to take timely action to contain any losses and liquidity pressures arising from this exposure while minimising market disruption. To facilitate this, a CCP should have effective default management rules and procedures that enable it to continue to meet its obligations and absorb any losses arising from closing out the defaulting participant's portfolio. In very extreme cases, a CCP may be unable to contain losses within prefunded financial resources or effectively restore the CCP to a matched book. In such circumstances, the CCP's rules and procedures should enable it to allocate losses to non-defaulting participants or terminate unmatched transactions, and also replenish its financial resources following the completion of the default management process.

Events in recent years have highlighted the importance of effective default management processes at CCPs. In September 2018, Nasdaq Clearing AB (Nasdaq) utilised approximately two-thirds of the Nasdaq commodities default fund when attempting to return to a matched book following the default of a single participant. Global regulators, CCPs, participants and other stakeholders have reflected on how Nasdaq's default management process contributed to the size of the losses. ASX Clear has also had recent experience of managing a default. In 2015, BBY Limited (BBY) was placed into default after missing a margin call. ASX closed out BBY's portfolio within the available margin, though some weaknesses in ASX Clear's default management approach were identified that have since been addressed.

SSFs typically do not assume financial risks in the event of a default. However, if a settlement participant were to default, an SSF should have effective default management rules and procedures to enable it to continue to achieve the timely settlement of transactions while minimising the impact on transactions not involving the defaulting participant. This may involve suspending the defaulting participant and in some cases removing transactions it has submitted for settlement.

4.2 Scope and Approach

4.2.1 FSS requirements

The key FSS requirements on default management arrangements are set out in CCP Standard 12 and SSF Standard 11. These requirements cover five main areas, summarised in Table 5:

Table 5: Key FSS Requirements for Default Management

Area(s)	Standard(s)	Key requirements
Rules and procedures	CCP Standard 12.1 and SSF Standard 11.1	The CS facility should have: • clearly documented rules and procedures, which are legally binding on the CS facilities and their participants • a comprehensive set of powers, tools and financial resources to undertake default management actions • prompt access to financial resources • transparent and predefined procedures for utilising and replenishing financial resources to meet any losses and mitigate liquidity pressures in the event of a default.
Governance and processes	CCP Standards 12.1, 12.2 and SSF Standards 11.1, 11.2	The CS facility should: • specify roles, obligations and responsibilities of all parties involved in managing the default; these parties should have appropriate tools and expertise to carry out their roles and responsibilities with respect to default management. • have appropriate oversight to return to a matched book within a short time frame and minimise market disruption by ensuring that the obligations created for non-defaulting participants are proportional to the scale and nature of their activities.
Testing and review	CCP Standard 12.4 and SSF Standard 11.4	The CS facility should: • review its default management plan at least annually or following any material changes to its rules or procedures, or service offering • regularly test the default management framework with all parties that would be involved in managing the default of a participant.
Public disclosure	CCP Standard 12.3 and SSF Standard 11.3	The CS facility should provide transparency over key aspects of its default management plans to provide certainty and predictability to stakeholders regarding the actions it may take in a default event.
Market impact	CCP Standard 12.5 and SSF Standard 11.5	The CS facility should take into account the impact of its default management plans on all relevant financial markets.

The Bank assessed the ASX CS facilities against these requirements and selected FSS requirements for legal basis, governance, financial risk management and recovery to the extent that these were relevant to the effectiveness of the default management and recovery framework.

4.2.2 Methodology

The Bank reviewed the design of the ASX CS facilities' default management framework and supporting rules, policies and procedures against the FSS as the special topic for the 2016 Assessment, concluding that all relevant requirements were observed. The current review focuses on the practical and operational aspects of the framework. It also covers changes made since the 2016 review, including those that were made as a result of lessons learned from the BBY and Nasdaq defaults. The review looks at enhancements made to the ASX CS facilities' recovery arrangements since the Bank's last review in 2015, such as the expansion of the set of recovery tools available. The Bank took a range of approaches to assess the ASX CS facilities' ability to implement practical elements of its default management framework. These included desktop walkthroughs of different default scenarios involving participants with a variety of key roles across the Australian financial system and an additional default management fire drill initiated without notice by the Bank, designed to test ASX's preparedness to generate the reporting required to manage a default at any time.

The Bank also gave consideration to ongoing Council of Financial Regulators (CFR) work on maintaining the continuity of access to critical FMI services for an authorised deposit-taking institution (ADI) in resolution. This work is motivated by a concern that the loss of access to FMIs could impede the successful resolution of a systemically important ADI.

4.3 ASX Default Management Framework

Overall, the Bank has concluded that ASX has a well-established framework for managing the default of a participant. Since the last review in 2016, ASX has continued to improve its default management arrangements, particularly in respect of the functionality of systems underpinning default management processes, default management fire drills and auction processes. The Bank's assessment is that all ASX CS facilities have observed the relevant FSS requirements for participant default management policies and procedures (CCP Standard 12, SSF Standard 11).

This section describes the ASX CS facilities' default management framework, the findings from the review and actions required to close identified gaps. ASX's approach to managing a clearing participant default substantially differs from its approach to managing a settlement participant default and so these processes are discussed separately. Differences between the two ASX CCPs (ASX Clear and ASX Clear (Futures)) and between the two ASX SSFs (ASX Settlement and Austraclear) are also highlighted where relevant. However, as participants of the ASX CCPs are also participants in the ASX SSFs, it is likely that ASX will have to manage the default of a clearing participant and the settlement participant at the same time.

4.3.1 Governance and legal basis

Good governance is critical to maintaining a robust default management and recovery framework (DMRF). It facilitates prudent decision-making in default management that balances the interests of stakeholders.

Each of the ASX CS facilities has powers under their operating rules and procedures to deal with the default of a participant. The formal rules are supplemented by internal and public documents that form part of ASX's DMRF for the four CS facilities. Participants of the ASX CS facilities are legally bound by the operating rules of the facility, including the minimum requirements for participation in the facility. These arrangements provide ASX with the legal basis to take actions to manage a default.

Following the BBY default, ASX implemented enhancements to its rulebook taking into account lessons learned. These included additional flexibility for suspending a participant, powers to offset opposing positions between accounts held by multiple defaulting participants, broadening defined events of default and provisions for information disclosure to other FMIs. While ASX's DMRF is largely well documented, there are areas where it can be further improved, such as clarifying any overlapping responsibilities of the CS Boards and the ASX Limited Board. Ultimate responsibility for the oversight of risks faced by the ASX CS facilities lies with the board of each facility (known collectively as the CS Boards). The Chief Executive Officer (CEO) of ASX acts under delegated authority from the CS Boards, and is responsible for exercising the powers of the CCP for managing a default event. Although the CS Boards have delegated functions relating to the exercise of recovery powers to the CEO, it is expected that any final decision to trigger a recovery tool will be made following input from the relevant CS Board, other than in exceptional circumstances where a decision must be made urgently to ensure the CCP's solvency.

The DMRF assigns specific responsibilities in managing a participant default across a number of internal and external groups. Within ASX, there are functional areas responsible for monitoring participants' compliance with their participation requirements, creditworthiness and the CCPs' exposures to participants. These areas support default management processes and groups/committees responsible for managing and monitoring participant incidents and events of default, alongside advice provided by legal, compliance, and operational departments. ASX's Default Management Committee (DMC), chaired by the ASX CRO, is responsible for recommending to the CEO whether to declare a default, devising a risk reduction plan and implementing this plan. ASX also has a working group responsible for identifying potential enhancements to the DMRF through regular review and testing, and monitoring the implementation of any enhancements that are approved by the CS Boards. The ASX CCPs use external default brokers to execute the close-out and hedging trades in exchange-traded products on behalf of the CCPs. Trading and risk experts seconded from ASX's OTC clearing participants also provide advice to the DMC for the hedging of OTC interest rate swaps.

This allocation of responsibilities is broadly appropriate. However, the FSS require that a CCP's operations, risk management processes, internal control mechanisms and accounts should be subject to internal audit and where appropriate, periodic external independent expert review. The Bank was unable to find evidence of ASX's DMRF being independently reviewed to date. In recent years, ASX's Internal Audit function has considered undertaking such an audit but decided to defer this until after the implementation of substantial improvements to its DMRF that were identified following the BBY default. The Bank will discuss with ASX the appropriate frequency and scope of audit of its DMRF in the coming assessment period.

4.3.2 Declaration of default

ASX can declare the default of a CS facility participant if the participant triggers an 'event of default'. This could include a breach of financial, operational or compliance obligations set out in the operating rules and guidance notes for each of the ASX CS facilities. Examples include the participant becoming subject to external administration, it defaulting at another exchange, or being unable to fulfil obligations such as missing a margin payment. If there are indications that an event of default has occurred, the chair of the Participant Issue Response Group (PIRG) is notified, who could convene a meeting of the PIRG. In cases where the PIRG concludes that a potential default event is likely, the matter is referred to the chair of the DMC and a meeting of the DMC will be convened.

Participants are obliged to inform ASX immediately if an event of default has occurred. A declaration of default is not automatic. Instead, ASX maintains the right to investigate the matter first, taking into account the severity of any breach or event of non-compliance, the potential consequences of declaring an event of default, and any extenuating circumstances. This allows ASX to consider alternative approaches to handling the incident, such as working with the participant to restore viability or implementing an orderly wind-down plan.

Suspension and termination

Once a default is declared, the ASX CS facilities will move to suspend the participant's authority to clear or settle all or a part of its transactions. To give immediate effect to the suspension, ASX can remove the participant's access to trading, clearing and settlement platforms as well as payment systems. Some flexibility is permitted under ASX's approach. If a participant in either ASX SSF triggers an event of non-compliance or default, ASX has the discretion to suspend, terminate or restrict the participant's access to the SSF. Unless permitted by ASX, a suspended or terminated ASX Settlement participant is

unable to effect transfers of any securities holdings on the CHESS sub-register, including those of its sponsored clients. If a defaulting participant is due to receive a net payment in that day's CHESS settlement batch, ASX may allow the defaulter to continue to participate in the batch in limited circumstances. However, a suspended or terminated Austraclear participant must immediately withdraw its securities from the SSF and make alternative holding arrangements when requested by Austraclear.

Communication with external stakeholders

Should ASX determine it necessary to declare an event of default or otherwise suspend or terminate a participant, it would immediately notify the Bank and ASIC (as regulators), and a market notice would be issued for public information, including to inform non-defaulting participants as soon as possible. However, ASX's procedures are not explicit that the notification to regulators should occur in advance of declaring the default of a participant. It would be appropriate for ASX to formalise this requirement to ensure that regulators have an opportunity to discuss the decision prior to the default being formally declared.

4.3.3 Managing financial risks

The ASX SSFs do not provide a guarantee of obligations that they settle and so they are not directly exposed to financial risk in the event of a participant default. By contrast, in a default situation the ASX CCPs would assume the obligations of a defaulting participant. Where practicable, ASX would seek to transfer or port the derivatives positions of a defaulted clearing participant's clients to another participant. Porting mitigates the costs and potential market disruption associated with the close-out process, provides continuity of positions to the client, and may reduce ASX's risk exposure. However, it may be difficult to achieve in a timely manner if the client does not have an existing relationship with another clearing participant, or does not hold an individually segregated account.

Following this, a strategy for closing out the defaulted participant's portfolio is developed. The CRO is responsible for developing this strategy and proposing it to the DMC for approval, taking into account advice from OTC trading and risk experts. To do this, ASX uses a CRO loss estimate tool, which estimates the CCP's potential losses on the participant's portfolio based on judgements about prevailing market conditions and their impact on the time and cost of liquidating the defaulter's portfolio. The size of the CRO loss estimate provides the criteria for escalation to the Board and the participant Risk Consultative Committees (RCCs), for decisions regarding whether to take recovery actions and is used to inform decision-making by the DMC. ASX plans to make updates to the calculation and reporting of the CRO loss estimate, which include enhancements to the associated reporting dashboard to include additional information and building out functionality for assessing the impact of actual and hypothetical market moves on ASX Clear. The Bank will further discuss these planned updates to the calculation and reporting of the CRO loss estimate with ASX, including to understand how the principles underpinning the estimate are governed.

Risk mitigation

To manage its market risk exposure, ASX typically first seeks to reduce its risk exposure to complex products and liquidate exchange-traded products with high market liquidity through its default brokers. Beyond this, ASX's approach depends on the products in the portfolio.

- For cash market transactions, ASX Clear will typically carry the defaulted participant's outstanding cash equity transactions through to settlement or enter into market transactions to sell or purchase securities to facilitate the settlement of novated transactions.
- For exchange-traded derivatives (ETDs), ASX Clear and ASX Clear (Futures) may employ a variety of methods to close out or otherwise manage the positions of a defaulted participant. These include on- or off-market liquidation of the portfolio including via close-out by entering into equal-but-opposite transactions, an auction process, or exercise or expiry of contracts. For example, while ASX typically prefers to liquidate ETD positions on market, it would consider an auction process for a sufficiently large portfolio of electricity derivatives given the lower level of liquidity in these products.
- For OTC interest rate swaps, ASX Clear (Futures) would initially look to hedge its exposure against the risk of a broad shift in yields. Once its DMG had been convened, it would provide advice on refining these hedges to further reduce risk exposure and in a way that would make the hedged portfolio most attractive to bidders in a default management auction. Following execution of these hedges, non-defaulting participants would be invited to participate in an auction of the defaulter's portfolio. All OTC clearing participants that have positions in the relevant products are required to bid.

ASX has made a number of improvements to its auction procedures since the 2016 review, for example, to provide auction participants with more clarity over the auction processes. However, this is an area in which international best practice is continuing to develop. In June, CPMI-IOSCO published a discussion paper on *Central counterparty default management auctions – Issues for consideration* that sets out the emerging best practice among international CCPs. The Bank will discuss with ASX how its practices compare with those set out in this paper, particularly in light of the potential for ASX to develop auction procedures for the liquidation of a broader range of its exchange-traded products.[17]

Liquidity management

Under normal circumstances, CCPs rely on incoming payments from participants to meet their obligations to other participants. If a participant were to default, the CCP could face a liquidity shortfall if it is unable to fund its payment obligations to the non-defaulting participants. These obligations arise from a range of sources, including payments of initial, variation and additional margin, for the settlement of a securities transaction, or the cash settlement of derivatives contracts. The majority of the liquid resources that the ASX CCPs would use to meet these obligations are sourced from the defaulting participant's cash collateral and ASX and participant contributions to the CCPs' default funds. These are invested in liquid assets in a pooled investment portfolio held on trust for the CCPs by their parent company, ASX Clearing Corporation Limited (ASXCC, see Appendix B.3). ASXCC has access to the Bank's domestic market operations and would be able to seek liquidity from the Bank if it was unable to liquidate sufficient assets on market to meet the CCPs' liquidity requirements.

However, ASX Clear (Futures) is currently unable to access liquidity from the Bank in respect of non-cash collateral provided by a defaulted participant. While ASX Clear (Futures) would seek to liquidate this collateral in the market in the first instance, its default management approach assumes that it can use these securities in order to enter into a repurchase agreement (repo) with the Bank as an alternative. Although the securities are themselves eligible for repo with the Bank, ASX's intragroup legal arrangements do not allow ASXCC to take custody of the securities in order to enter into a repo with

17 The CPMI-IOSCO discussion paper is available at <https://www.bis.org/press/p200625.htm>

the Bank. ASX Clear (Futures) cannot itself enter into a repo with the Bank in respect of those securities because, at present, it is not an eligible counterparty of the Bank.

Recommendation. ASX Clear (Futures) should take all necessary steps to establish an ability to access liquidity from the Bank in respect of a defaulting participant's non-cash collateral.

4.3.4 Loss allocation

If the ASX CCPs incurred a loss in managing the default, the CCPs would allocate these losses to their prefunded financial resources (see Appendix B.3). In the first instance, ASX would meet losses or obligations arising from the default using collateral lodged by the defaulted participant in the form of cash or eligible securities. In the event that the collateral lodged by the defaulted participant, including initial margin and its contribution to the default fund, was insufficient to cover the losses stemming from the default, the CCP could draw upon the remainder of its prefunded pooled financial resources (i.e. the CCP's default fund). ASX Clear's default fund was $250 million at the end of the assessment period, comprised of $178.5 million of own equity and $71.5 million paid into a restricted capital reserve from the National Guarantee Fund in 2005. The default fund of ASX Clear (Futures) was $650 million at the end of the assessment period, prefunded with contributions from both ASX and clearing participants.

Recovery tools and replenishment

In the event that losses at one of the ASX CCPs exceeded its prefunded financial resources, the following tools would be available to them.

- *Recovery assessments.* ASX's recovery arrangements allow it to allocate uncovered losses to its clearing participants (known as 'recovery assessments'). The size of recovery assessments allocated to each participant would be proportional to the risk that they bring to the CCP. For ASX Clear (Futures), assessments would be capped at $200 million per participant default, up to a maximum of $600 million for multiple defaults within a defined default period. For ASX Clear, assessments would be capped at $300 million for one or multiple defaults.
- *Payment haircutting.* This tool allows ASX Clear (Futures) to reduce (haircut) outgoing payments to participants in order to allocate losses suffered on the defaulting participant's portfolio.
- *Partial or complete termination.* Following the allocation of any losses, the CCPs would seek to restore a matched book. If the defaulter's positions could not be closed out in the market or by auction, the ASX CCPs have the power to force the termination of some or all open contracts in order to restore a matched book. Complete termination can also be used to allocate any residual losses of the CCP not addressed by other tools, by haircutting settlement payments to participants (for details, see Appendix B.3).

Once default management has been completed, all losses have been allocated and the CCP restores a matched book, the default fund will require replenishment if it has been partially drawn down or exhausted. For replenishment, the ASX CCPs would seek additional contributions to the default fund from ASX Limited and the remaining participants such that the total contributions of each group to the replenished fund are equal. ASX has put in place an intragroup agreement (Replenishment Deed) that governs ASX Limited's commitment to recapitalise the ASX CCPs in this scenario. The Bank plans to

review the legal certainty of ASX Limited's commitment to replenish the CCPs' default funds in the next assessment period.

CCP recovery and replenishment arrangements depend on the ability of participants to meet their obligations under these arrangements in extreme scenarios. This may be particularly challenging for smaller participants that could face liquidity constraints in stressed market conditions, and have more limited options for raising additional funds than a large, well-capitalised participant. While participants in ASX Clear (Futures) are generally larger, well-capitalised institutions, there are a number of smaller participants at ASX Clear.

If losses following a default are so severe that they exceed the entire ASX Clear default fund, participants could be subject to recovery assessments of up to $300 million in aggregate, payable the next business day following notification. Once default management has been completed and all losses have been allocated, participants may be required to contribute up to $75 million in aggregate within 22 business days, with up to half of this payable within as few as five days. Smaller participants will bear a correspondingly smaller proportion of these obligations. However, ASX Clear does not have a process in place to periodically assess whether the risk that some participants may have difficulty in meeting recovery or replenishment obligations is unacceptably high. If participants were unable to meet these obligations they may themselves default, or in the case of replenishment obligations may choose to resign from ASX Clear. If these were smaller participants, the direct financial risk to ASX Clear from this is likely to be small, but their exit could exacerbate the prevailing situation of extreme stress.

Recommendation. ASX should assess the risk that participants may default on their obligations or choose to resign from ASX Clear due to difficulty in meeting recovery or replenishment obligations.

In 2017, CPMI and IOSCO published updated guidance on the *Recovery of financial market infrastructures*.[18] While ASX has previously considered the guidance in reviewing its recovery plan, the Bank identified further enhancements as part of this special topic that ASX should implement. For example, ASX should: formally analyse and document the appropriateness of its recovery tools taking into account the nature of its products and markets; describe the legal basis for its recovery tools and procedures, including consideration of whether any foreign laws or regulations could be an impediment to the implementation of the plan; and set out and explain distinct decision-making points in the default management and recovery processes. ASX will perform comprehensive benchmarking of its recovery plan to the guidance and update it to address any identified inconsistencies.

FMI Regulatory Reforms package

The Bank and other CFR agencies have developed a proposal for enhancements to the regulatory regime for CS facilities, markets, trade repositories and benchmark administrators. The proposed reforms aim to ensure that the regulators have strong and dependable powers to carry out their mandates and mitigate the risk of disruption to FMI services. The introduction of a crisis management regime for licensed CS facilities is also proposed. If the government decides to implement these reforms, ASX should review whether any updates are required to its DMRF to ensure consistency with the new crisis management regime.

18 The updated CPMI-IOSCO recovery guidance is available at <https://www.bis.org/cpmi/publ/d162.htm>

4.3.5 Settlement procedures

ASX Settlement

ASX Settlement performs its cash and securities settlements in a daily multilateral net batch. If a participant was unable to settle its scheduled obligations, including in the event that it was suspended from the SSF, ASX Settlement could remove some or all of that participant's settlement instructions from the daily batch using its 'back-out algorithm'. The back-out algorithm is an important tool used in the management of ASX Clear participant defaults. In the event that the defaulted participant had a net payment obligation, ASX Clear would first consider injecting liquidity to ensure the settlement of novated trades. If it was not possible or prudent to rely solely on available liquid resources, ASX would use the back-out algorithm to identify instructions to be settled by means of OTAs with participants that were due to deliver securities (see section 2.2.3).

Since transactions in ASX Settlement settle in a batch on a multilateral net basis, backing out a defaulter's transactions could also have an impact on the ability to settle other transactions to which the defaulter was not a counterparty. The back-out algorithm is designed to avoid increasing non-defaulting participants' net payment obligations (which would require a fresh payment authorisation), and seeks to remove or roll over as few instructions from the batch as possible, maximising settlement values and volumes, while minimising the spillover to other participants. Instructions unrelated to novated settlement obligations would typically be backed out first. If the failed instructions related to a shortfall of funds, the algorithm would remove instructions from the batch that reduced the participant's payment obligations to zero or a small receipt. Failed instructions arising from a securities shortfall would be rescheduled for settlement on the next settlement day.

Austraclear

The settlement of transactions in Austraclear is on a real-time gross basis. The majority of Austraclear transactions involve the simultaneous transfer of cash and securities between the buyer and seller on a trade-by-trade basis. If a participant was unable to settle its scheduled obligations, including in the event that it was suspended from the SSF, Austraclear would cancel any queued trades. The finality of any transactions of the defaulting participant that had already settled is protected under Part 2 of the *PSNA*.

Since Austraclear does not guarantee the settlement of trades, the impact of any cancellation of a defaulter's unsettled transactions falls only on the defaulter's counterparties. If the defaulting participant is also a participant in ASX's centralised collateral management service (ASX Collateral) then Austraclear will assist ASX Collateral in acting as the receiver's agent to enforce other participants' rights to collateral upon the notification of a default.

Where a settlement participant of Austraclear is suspended from participation, it may be required to make alternate arrangements for holding securities. For example, its clients would be required to nominate another Austraclear participant to hold their securities or securities may be held directly on the issuer's register.

4.3.6 Testing and review

ASX reviews its DMRF at least annually, or following a material change to its framework. The DMRF is also tested regularly, primarily through conducting regular default management fire drills. Within any year, ASX typically conducts three to four fire drills. The fire drills assist in ensuring that relevant ASX

personnel are familiar with the default management process and identify areas where the DMRF should be updated. The Bank and ASIC are invited to observe a number of these fire drills. Findings, including any recommended enhancements to the DMRF, are reported to ASX's Default Management and Recovery Working Group, which is responsible for the ongoing review of the DMRF, after each fire drill. In addition, ASX discusses the results of the fire drills and any recommended enhancements with its RCCs and the Bank.

Planned developments

ASX intends to implement a number of enhancements to its fire drills. These include increasing the complexity and scope of fire drill scenarios, greater involvement of the CS Boards, the liquidity provider and newly appointed brokers and delegates of DMC members. ASX also plans to begin running regular unannounced internal fire drills to test reporting capability. In November 2020, ASX is planning to conduct a fire drill that simulates a recovery scenario. As part of this test, the Bank encourages ASX to test communication arrangements and decision-making processes and involve a broad set of stakeholders.

Learnings from the Nasdaq default

ASX benchmarked its DMRF to the learnings from the Nasdaq default in 2018 and identified that it had implemented the recommendations or had established initiatives to address most of the learnings from the default. Of these, ASX has planned additional work in two areas.

- *Take steps to improve the market liquidity for electricity derivatives and options.* If there is sufficient market liquidity for a product, a CCP will be able to close out a defaulter's portfolio within its MPOR without an adverse price impact. ASX has self-identified that it can take additional steps to improve the market liquidity for electricity derivatives and options. ASX launched a market-making scheme for these products in July 2019. Three market makers in each regional energy market have been provided with incentives to provide quotes for a short period of time twice a day. There has been a significant increase in traded volumes following these changes. ASX also plans to review its range of electricity contracts to determine whether they are all sufficiently liquid to be suitable for clearing. ASX has implemented preliminary changes to the daily settlement process for options in order to increase traded volumes and is planning further enhancements over 2020/21.
- *Back-up clearing arrangements.* If clients have arrangements with more than one clearing participant, then it is more likely to be possible to transfer positions held at one to the other in the event that the first participant defaults. Similarly, a client in that position may be able to bid on its own portfolio via its second clearing participant in the default management auction of the first participant. ASX has planned additional work to encourage the largest electricity clients to utilise back-up clearing arrangements.

Further enhancements

For large and complex portfolios, a CCP may face operational challenges if default management processes for different asset classes differ and cannot be run simultaneously. This could result in the actual time it takes to close out such a portfolio being longer than the assumed MPOR across some of these asset classes. ASX has not completed a systematic review of the consistency between its MPOR assumptions and its operational capacity to liquidate portfolios across all asset classes.

In some extreme scenarios involving payment provider resolution processes it may be useful for ASX to defer the entire CHESS batch for a day to allow additional time for the participant in resolution to meet

its payment obligations and avoid a default. However, ASX has performed only limited testing of this process.

Recommendations.

The ASX CCPs should review whether its calibration of MPOR assumptions and margin add-ons is consistent with the time it would take to liquidate large and diverse portfolios, taking into account the sequencing of liquidation in a default scenario.

ASX should test the process of deferring the CHESS batch overnight and review the implications of this approach for default management.

4.3.7 Disclosure

In accordance with the CPMI-IOSCO *Public quantitative disclosure standards for central counterparties* (the Quantitative Disclosures), ASX publishes quantitative disclosures on its website on a quarterly basis. In addition, it publishes biennial qualitative disclosures in accordance with the *Disclosure Framework and Assessment Methodology* prescribed under the PFMI. Since the last review in 2016, ASX has enhanced its public disclosures on default management. This includes increasing stakeholders' awareness of ASX's default management and recovery arrangements via engagement with the RCCs, development of participant disclosures on the potential liquidity impact from the use of OTAs, and updates to the disclosures on its website in accordance with the Quantitative Disclosures. However, there may be opportunities for ASX to implement further enhancements over time to ensure that these disclosures remain fit for purpose.

Appendix A: 2019 Areas of Supervisory Focus

Table 6: Summary of Progress against 2019 Areas of Supervisory Focus

Development	Standard	Facility	Actions
Review of Planned Work			
Legal basis. Completion of work to enhance, formalise and document BAU controls for legal risks.	CCP and SSF Standard 1	All facilities	ASX implemented a SharePoint site that acts as a central resource for BAU controls for legal risks. The site includes links to updated contract review and execution processes and formalised guidance on when legal advice should be sought. ASX established guidelines for engaging external lawyers. ASX intends to conduct further work to embed requirements for legal input in documented business processes. For more information see section 3.1.2.
Settlement finality. Implementation of planned changes to operating rules for all CS facilities to clarify that changes to operating hours are exceptional and require individual justifications.	CCP Standard 8, SSF Standard 7	All facilities	On 6 July, ASX amended operating rules to clarify that changes to operating hours are exceptional and require individual justifications.
CCP Resilience Guidance. Implementation of ASX's plans to address gaps against the CCP Resilience Guidance that are minor but indicative of good practice in financial risk management.	CCP Standards 2, 4, 5, 6, 7 and 15	Both CCPs	The ASX CCPs continue to implement a multi-year work program to address identified gaps against the CCP Resilience Guidance, see Box B.
Liquid resources. The implementation of the additional liquidity facility by ASX Clear.	CCP Standard 7	ASX Clear	ASX Clear executed an $80 million additional liquidity facility with a major bank, see section 2.2.3.
CHESS replacement. The development of the new clearing and settlement system for cash market transactions, including how the new system aligns with the requirements in the FSS and supports ASX's risk management capabilities, and the clarity, effectiveness and documentation of default management processes.	CCP Standard 14	ASX Clear and ASX Settlement	ASX has consulted on extending the timeline of the CHESS replacement project by one year with a revised target launch date for the new system in April 2022, see section 3.3.1.
Cyber resilience. Continued enhancement of ASX's cyber resilience via: • the implementation of actions identified in ASX's Cyber Strategy roadmap • ASX's evaluation of current and emerging technology that could lead to further enhancements to the abilities of ASX to recover from cyber attacks in a timely manner.	CCP Standard 16, SSF Standard 14	All facilities	ASX has progressed work to implement actions in its Cyber Strategy roadmap. Work to evaluate technology that could further enhance recovery capabilities is expected to take longer to progress, see section 3.3.4.

Other			
ASX Group support agreement. The Bank will conduct a broader review of the ASX Group Support Agreement, covering aspects outside the scope of the 2018/19 special topic assessment of the CS facilities' legal basis.	CCP Standard 14 and SSF Standard 12	All facilities	The review was postponed pending the completion of work to enhance the certainty of access to business, operational and investment risk capital and will be undertaken in the next assessment period.
Collateral concentration limits. The Bank will discuss with ASX Clear its conclusion that it is not necessary to impose concentration limits for equity collateral.	CCP Standard 5	ASX Clear	ASX conducted further analysis that concluded concentration limits are not necessary in equity collateral. ASX plans to share this analysis with the Bank and conduct similar analysis on a quarterly basis to verify that this conclusion remains appropriate. See section 3.4.3.

Appendix B: Background Information

B.1 ASX Group Structure and Governance

There are two types of CS facilities operated by the ASX Group:

- *CCPs*. A CCP acts as the buyer to every seller, and the seller to every buyer in a market. It does so by interposing itself as the legal counterparty to all purchases and sales via a process known as novation. These arrangements provide substantial benefits to participants in terms of counterparty risk management as well as greater opportunities for netting of obligations. At the same time, however, they result in a significant concentration of risk in the CCP. This risk can crystallise if a participant defaults on its obligations to the CCP, since the CCP must continue to meet its obligations to all of the non-defaulting participants. The ASX CCPs manage this risk in a number of ways, including through participation requirements, margin collection, the maintenance of pooled resources and loss allocation arrangements (see Appendix B.3).
- *SSFs*. An SSF provides for the final settlement of securities transactions. Settlement involves transfer of the title to the security, as well as the transfer of cash. These functions are linked via appropriate delivery-versus-payment (DvP) arrangements incorporated within the settlement process.

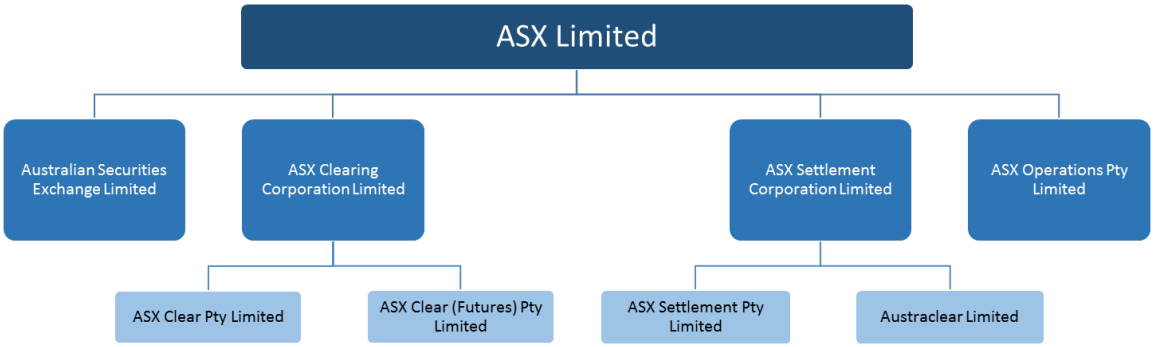
The ASX Group operates two CCPs and two SSFs:

- *ASX Clear* provides CCP services for ASX-quoted cash equities, debt products and warrants traded on the ASX and Chi-X Australia Pty Ltd (Chi-X) markets, equity-related derivatives traded on the ASX market and Chi-X-quoted warrants traded on Chi-X. The provision of CCP services for Chi-X is provided under the Trade Acceptance Service (TAS), which allows ASX Clear to act as a CCP for trades executed on Approved Market Operator (AMO) platforms in accordance with the ASX Clear Operating Rules and Procedures.
- *ASX Clear (Futures)* provides CCP services for futures and options on interest rate, equity, energy and commodity products traded on the ASX 24 market, as well as AUD and NZD-denominated OTC interest rate derivatives (IRD).
- *ASX Settlement* provides SSF services for ASX-listed cash equities, debt products and warrants traded on the ASX and Chi-X markets. The provision of SSF services for Chi-X is provided under the TAS. Under the Settlement Facilitation Service, ASX Settlement provides DvP settlement services for transactions in non-ASX-listed securities undertaken on trading platforms operated by Approved Listing Market Operators; these include the National Stock Exchange of Australia and the Sydney Stock Exchange Limited. ASX Settlement also provides for subscriptions and redemptions in unlisted managed funds through the mFund Settlement Service.
- *Austraclear* provides settlement and depository services for debt securities, including government bonds. It also provides settlement services for derivatives traded on the ASX 24 market and for margin payments in ASX Clear and ASX Clear (Futures).

Each of the ASX facilities holds a CS facility licence, and each CCP and SSF is required under the Corporations Act to comply with the relevant FSS determined by the Bank (i.e. the CCP Standards and SSF Standards, respectively) and to do all other things necessary to reduce systemic risk (see Appendix B.2).

ASX Limited is the ultimate parent company of the four CS facilities (Figure 1) and is listed on the ASX market. The ASX Limited Board is responsible for overseeing the processes for identifying significant risks to ASX and ensuring that appropriate policies, as well as adequate control, monitoring and reporting mechanisms, are in place. In addition, the ASX Limited Board assigns certain responsibilities to subsidiaries within the group, including the boards of the four CS facilities (the CS Boards). The CS Boards are responsible for managing the particular clearing and settlement risks faced by each respective CS facility, including through compliance with the FSS. The CS Boards are subject to common governance arrangements with high-level objectives set out in the CS Boards' Charter. There are five directors that serve on all four CS Boards; one additional director serves on both the ASX Clear and ASX Settlement Boards and three additional directors serve on both the ASX Clear (Futures) and Austraclear Boards.

Figure 1: ASX Group Structure



In the ASX corporate structure, the two CCPs – ASX Clear and ASX Clear (Futures) – are subsidiaries of ASXCC. ASXCC is the holding company for the two CCPs and manages the financial resources that the CCPs would use in the event of a default. It invests these resources according to a Treasury investment policy and investment mandate approved by the CS Boards. The two SSFs – ASX Settlement and Austraclear – are subsidiaries of ASX Settlement Corporation Limited. ASXCC and ASX Settlement Corporation Limited are in turn subsidiaries of the ASX Group's parent entity, ASX Limited. ASX Limited is the licensed operator of the ASX market, which provides a trading platform for ASX-quoted securities and equity derivatives. Another subsidiary, Australian Securities Exchange Limited, is the licensed operator of the ASX 24 market, an exchange for futures products.

In delivering their services, the CS facilities rely on group-wide operational and compliance resources held by ASX Operations Pty Limited (ASX Operations), a wholly owned subsidiary of ASX Limited. ASX Operations provides most operational resources required by the CS facilities.

ASX has adopted a group-wide organisational structure to manage the business operations of its various entities. Business units relevant to the CS facilities are organised into eight main groups:

- Office of the CEO
- Risk

- Operations
- Technology
- Business Development
- Office of General Counsel and Company Secretariat, and Regulatory Policy
- Finance
- Human Resources.

The CRO, who heads the Risk group, is responsible for providing executive oversight of ASX's Clearing Risk Policy Framework and Settlement Risk Policy Framework, which document the formal structure for the development, governance and review of policy and standards for the CCPs and SSFs.

The COO who heads the Operations and Technology groups, is responsible for providing executive oversight of the frontline management of risks under ASX's Settlement Risk Policy Framework. The COO is also responsible for the delivery of overall operations of the ASX Group and reports directly to the CEO, as does the CRO. Both COO and CRO have a direct reporting line to the CS Boards and are able to attend CS Board meetings.

The Risk and Operations groups contain a number of departments that play key roles in the management of risks faced by the CS facilities:

- Clearing Risk Quantification and Development (CRQD) is responsible for the development of clearing risk management systems, maintaining and validating CCP risk and pricing models and the implementation of CCP policies and standards.
- Clearing Risk Policy and Management (CRPM) develops and maintains CCP and SSF policies and standards.
- Post Trade Operations implements SSF policies and standards, and maintains effective procedures for carrying out those policies and standards.
- Enterprise Risk is responsible for enterprise-wide risk management, including general business risk.
- Enterprise Compliance oversees CS facility compliance obligations, including providing compliance training for business areas, undertaking compliance reviews, and coordinating reporting to regulators.
- Participants Compliance assesses new applications from potential CS participants and monitors existing participants for adherence with the CS facilities' rules.
- Internal Audit conducts risk-based reviews of internal controls and procedures across ASX. Internal Audit reports to the Audit and Risk Committee and to the CRO for administrative purposes only.

ASX has three main executive-level committees that support decisions related to the risk management of the CS facilities:

- The Risk Committee is responsible for advising the CRO on risk management decisions in the exercise of his delegated authority from the CEO.
- The Regulatory Committee is responsible for ASX policies related to the conduct and operations of the licensed entities in the ASX Group, including the CS facilities.

- The Technology, Operations and Security Committee (TOSC) is responsible for advising the COO in the oversight of ASX's technology, operations and security strategies, and the investments that support these strategies. A sub-group of the committee meets as the Portfolio Governance Group, providing oversight of significant projects within the ASX Group.

ASX's Executive Committee operates in parallel to the three executive-level committees described above. The Executive Committee reports to the ASX Limited Board and CS Boards on strategic and business initiatives, non-risk related frameworks and HR matters.

ASX also operates a number of other internal forums that bring together experts from departments across the group for the review or oversight of risk management at the CS facilities:

- Risk Quantification Working Group (RQWG) is responsible for quantitative risk management matters, such as the review and application of quantitative risk policies and standards. It also reviews material changes to the Model Validation Framework, including in relation to the oversight of model governance and the outcomes and recommendations of regular reviews of margining and stress test models. The RQWG is chaired by the CRO.
- Pricing and Valuations Working Group (PVWG) is primarily responsible for overseeing the policies and processes used for pricing and settlement. The coverage includes daily settlement prices and expiry prices for derivatives traded on ASX Trade and ASX 24, valuation of collateral held by ASXCC (on behalf of the ASX CCPs), and non-cash investments held by Group Treasury. The PVWG is chaired by the General Manager, CRQD.
- Default Management and Recovery Working Group (DMRWG) provides oversight of the CCP's DMRF. The DMRWG is chaired by the CRO.
- PIRG is responsible for monitoring and managing material participant incidents, including any non-compliance with participant obligations, settlement default, operational failure or an event which might result in the participant becoming an externally administered body corporate or an insolvent under administration and, in the case of a clearing participant, escalating potential default events to the DMC.
- The Technology Risk Working Group (TRWG) is responsible for the management of active and emerging technology risks, technology KRIs, COO risk report, and six-monthly risk profiles, with the outcomes being reported to the TOSC. The TRWG is chaired by the Chief Information Officer and meets quarterly.
- In addition to the internal forums that ASX operates, the views of participants and other stakeholders are sought through external standing forums:
- An ASX Clear (Futures) DMG which is comprised of OTC participants and is consulted on aspects of the default management process.
- RCCs for both ASX Clear and ASX Clear (Futures), comprising participants from each CCP. The committees are consulted on material changes to default management processes, the margining methodology, the default fund, position and liquidity limits, participation criteria, and other changes affecting risk management practices or related rules.
- A Business Committee which acts as a stakeholder advisory body for ASX's cash market clearing and settlement services. The Committee is comprised of representatives of clearing participants, settlement participants, AMOs, share registries and a number of relevant industry associations.

- Advisory user groups for particular products and services (i.e. ETOs, rates and Austraclear), which are forums for participants to provide feedback on those products and services.

B.2 Regulatory Environment

The Corporations Act establishes conditions for the licensing and operation of CS facilities in Australia and gives ASIC and the Bank powers and responsibilities relating to these facilities. These powers are exercised under the governance of ASIC's Commission and the Bank's Payments System Board, respectively. The regulators' respective roles are defined in the Corporations Act.

- The Bank is responsible for determining standards (the FSS) for the purposes of ensuring that CS facility licensees conduct their affairs in a way that causes or promotes overall stability in the Australian financial system, and for assessing how well a licensee is complying with its obligation under the Corporations Act, to the extent that it is reasonably practicable to do so, to comply with these standards and do all other things necessary to reduce systemic risk.
- ASIC is responsible for assessing the extent to which CS facility licensees comply with all other obligations of a CS facility licensee arising under the Corporations Act, including notably the obligation, to the extent that it is reasonably practicable, to do all things necessary to ensure that the CS facility's services are provided in a fair and effective way.

The Bank has determined two sets of FSS relevant to its oversight of CS facilities: the CCP Standards and SSF Standards.

As licensees, the ASX CS facilities are required to provide the Bank with timely information on any material developments relevant to the services provided under its CS facility licence and its compliance with the FSS. The Bank also gathers information on the facilities through an open and ongoing dialogue with ASX staff, including through scheduled periodic meetings and ad hoc targeted meetings on specific topics.[19] Based on the information gathered, the Bank undertakes regular assessments of the ASX CS facilities.

The ASX CCPs are recognised by European Securities and Markets Authority (ESMA) as 'third-country CCPs'. This allows the ASX CCPs to continue to provide clearing services to participants established in the European Union (see section 3.5.1 regarding the withdrawal of the UK from the EU). ASX Clear (Futures) was also granted an exemption from registration as a Derivatives Clearing Organization in the US. This exemption allows ASX Clear (Futures) to provide clearing services to US banks with respect to 'proprietary' swaps. The Bank and ASIC have established a memorandum of understanding (MoU) with each of ESMA and US Commodity and Futures Trading Commission which, among other things, supports cross-border cooperation and information sharing. The Bank has also issued a supplementary interpretation of CCP Standards to facilitate the ASX CCPs' recognition in the EU (see Appendix C).

The Bank has an MoU with the RBNZ which establishes cooperation arrangements relevant to ASX Clear (Futures)' existing activities in NZD-denominated products. RBNZ has also stated that ASX Clear

19 For more information see *The Reserve Bank's Approach to Supervising and Assessing Clearing and Settlement Facility Licensees*, available at <https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/clearing-and-settlement-facilities/standards/approach-to-supervising-and-assessing-csf-licensees.html>.

(Futures) may be of systemic importance in New Zealand and may therefore be designated for oversight as an offshore FMI under the RBNZ's proposed new oversight regime for FMIs.[20]

B.3 Risk Management in the ASX Central Counterparties

CCPs are exposed to both credit and liquidity risks, primarily following the default of one or more participants. Credit risk is the risk that one or more counterparties will not fulfil their obligations to the CCP, resulting in a financial loss, while liquidity risk arises where the CCP is unable to meet its payments obligations at the time that they are due, even if it has the ability to do so in the future. ASX Clear and ASX Clear (Futures) manage the risks arising from a potential default in a number of ways, including through participation requirements, margin collection, the maintenance of prefunded pooled financial resources, recovery tools, and risk monitoring and compliance activities.

Participation requirements

Participants in each CCP must meet minimum capital requirements. While capital is only a proxy for the overall financial standing of a participant, minimum capital requirements offer comfort that a participant has adequate resources to withstand an unexpected shock, for example, arising from operational or risk-control failings.

- ASX Clear requires direct participants that clear cash market products or derivatives to maintain at least $5 million in capital. 'General participants', which are able to clear on behalf of third-party participants, are subject to tiered capital requirements. A general participant must maintain $5 million in capital to support its own clearing activity and $5 million to support each third-party clearing relationship, up to a maximum of $20 million. These base capital requirements are supplemented by additional capital requirements that are designed to account for the complexity of each participant's business model. The additional capital requirements reflect each participant's activities in own-account business, non-ASX client activity, and client-written ETO activity. ASX applies an additional capital requirement of $2.5 million or $5 million for material activity in each of these areas, depending on the level of materiality. The total core capital requirement is capped at $35 million if the maximum level of additional capital requirements applies.
- ASX Clear (Futures) requires participants that clear futures only to hold at least $5 million in NTA. Participants using the OTC derivatives clearing service must meet a higher minimum NTA (or Tier 1 Capital) requirement of $50 million.

The CCPs also impose capital-based position limits (CBPLs) on participants' activity. Specifically, a participant's initial margin requirements cannot be more than three times the level of its liquid capital, NTA or Tier 1 Capital. Under certain conditions, banks and subsidiaries of banks or bank holding companies that are participants of ASX Clear (Futures) are not subject to a ratio-based limit. Rather, these institutions' initial margin liabilities are subject to a fixed $1.5 billion aggregate limit. If a participant exceeds its CBPL, it will be called for additional margin. ASX Clear also places requirements on participants to establish a formal liquidity risk management framework and prepare a twelve-month liquidity plan.

20 For more information, see 'An Enhanced Oversight Framework for Financial Market Infrastructures', available at <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/regulation-and-supervision/financial-market-infrastructure-oversight/regulatory%20developments/FMIs-Cabinet-paper.pdf?la=en>.

Prefunded financial resources

The CCPs cover their credit and liquidity exposures to their participants by collecting margin and maintaining a fixed quantity of prefunded pooled resources. The CCPs collect several types of margin.

- *Variation margin*. Variation (or 'mark-to-market') margin is collected at least daily from participants with mark-to-market losses and – in the case of futures, OTC derivatives and cash market contracts – paid out to the participants with mark-to-market gains.
- *Initial margin*. Both CCPs routinely collect initial margin from participants to mitigate credit risk arising from potential changes in the market value of a defaulting participant's open positions between the last settlement of variation margin and the close-out of these positions by the CCP. The CCPs use statistical models to calculate initial margin, which vary by product type. To validate the adequacy of their initial margin models, the CCPs perform regular backtesting and sensitivity analysis.
- *AIM*. The CCPs may also make calls for AIM when exceptionally large or concentrated exposures are identified, including through stress tests, or when predefined position limits are exceeded.

In addition to end-of-day margin calls, the CCPs call margin on an intraday basis when exposures exceed predefined limits due to changes in market value and the opening of new positions. If triggered, intraday margin calls for both CCPs equal the total shortfall in initial and variation margin.

ASX requires that any variation and intraday margin shortfall be posted in cash, while initial margin may be posted in the form of cash or securities that ASX would be able to rapidly and reliably liquidate in the event of the participant's default. Specifically, ASX Clear accepts certain equity securities and exchange-traded funds as collateral, while ASX Clear (Futures) accepts certain Australian Government and semi-government securities, US Treasury Bills, as well as foreign currency denominated in EUR, GBP, JPY, NZD or USD. Participants may meet AIM obligations using AUD cash or non-cash collateral, including Australian Government and semi-government securities. ASX applies haircuts to non-cash and foreign currency collateral to cover market risk on the liquidation of those assets.

An average of 58 per cent of margin requirements in ASX Clear and 91 per cent of AUD-denominated margin requirements in ASX Clear (Futures) were met in cash during the assessment period. In ASX Clear, equity securities comprise the remaining collateral. In ASX Clear (Futures), approximately 3 per cent of total collateral was held in foreign currency on average in 2019/20, while 9 per cent was Australian Government and semi-government bonds. Some clients of participants in ASX Clear commonly post non-cash collateral in excess of margin requirements for equity derivatives. In 2019/20, on average, 74 per cent of the value of non-cash collateral posted against derivatives positions in ASX Clear was in excess of margin obligations.

The margin and other collateral posted by a participant would be drawn on first in the event of that participant's default.[21] Should this prove insufficient to meet the CCP's obligations, the CCP may draw on a fixed quantity of prefunded pooled financial resources (referred to as the CCP's 'default fund'; Graph 5).

21 For ASX Clear (Futures) the other collateral would include the defaulted participant's contributions to the CCP's prefunded pooled financial resources.

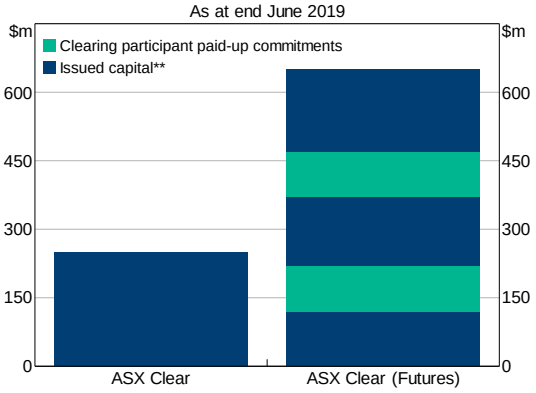
- ASX Clear's default fund was $250 million over the assessment period. This comprised $178.5 million of own equity and $71.5 million paid into a restricted capital reserve from the National Guarantee Fund in 2005.
- ASX Clear (Futures)' default fund was $650 million over the assessment period. This included $ 450 million of ASX's own equity and $200 million of contributions from participants.

There were no changes to either CCP's default fund over 2019/20.

Graph 5

Prefunded Pooled Financial Resources*

As at end June 2019



* The order of bars reflects the order of application, starting from the bottom and working upward

** For ASX Clear, Issued capital includes $71.5 million of restricted capital reserve

Source: ASX

Credit stress tests

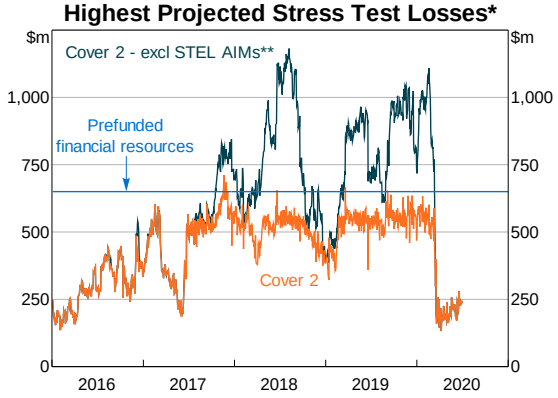
In order to assess the adequacy of its financial resources to cover its current and potential future credit exposures, the CCPs perform daily credit stress tests. These tests compare each CCP's available prefunded resources against the largest potential loss in the event of the joint default of two participants and their affiliates under a range of extreme but plausible scenarios (i.e. the Cover 2 requirement). The requirement for the ASX CCPs to have sufficient prefunded resources to meet Cover 2 reflects the Bank's supplementary interpretation of the FSS, under which both CCPs are deemed to be systemically important in multiple jurisdictions.

ASX Clear (Futures) experienced one day on which its credit stress test Cover 2 requirement exceeded its prefunded financial resources in 2019/20. This occurred on 9 September 2019, with a shortfall of $4 million (Graph 6). This projected shortfall was covered by AIM the next day. ASX Clear's Cover 2 requirement did not exceed its prefunded financial resources during 2019/20 (Graph 7).

The ASX CCPs automatically call AIM, to be paid before 11.00 am the next day, when credit stress test results are in excess of STELs. The STELs are based on external agencies' credit ratings and ASX's internal creditworthiness model (see section 3.4.5), with all STELs set at less than half of the total default fund of the relevant CCP. Not all of these STEL AIM calls are related to shortfalls in the Cover 2 requirement. During the assessment period, ASX Clear made STEL AIM calls on 226 days against 13 participants in total, with the largest totalling $250 million. ASX Clear (Futures) made STEL AIM calls on 181 days against seven participants in total, with the largest call totalling $298 million.

Graph 6

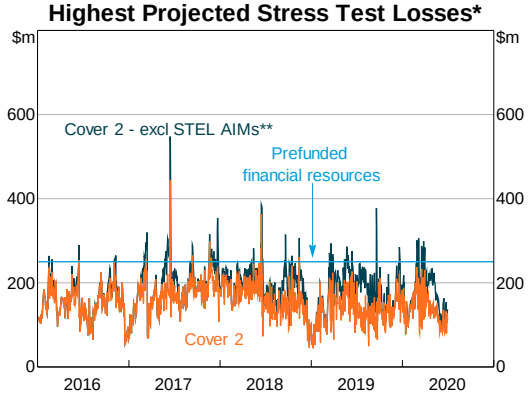
ASX Clear (Futures): Highest Projected Stress Test Losses*



* Highest projected stress test loss from the default of two participants
** ASX collects AIM when credit stress test results are in excess of STELs
Source: ASX

Graph 7

ASX Clear: Highest Projected Stress Test Losses*



* Highest projected stress test loss from the default of two participants
** ASX collects AIM when credit stress test results are in excess of STELs
Source: ASX

Liquidity risk management

Credit exposures faced by the CCPs from a participant default would also create liquidity exposures. The CCPs may also face default liquidity exposures in excess of their credit exposures. These additional exposures may be particularly large for ASX Clear, given that it novates equity trades with delivery obligations. For example, if a participant with net equity delivery obligations were to default, ASX Clear's liquidity exposure would include the cost of purchasing the securities to meet the delivery obligations of the defaulted participant. By contrast, the CCP's credit exposure would be limited to the change in price in the securities between the defaulting participant's last variation margin payment and the time the CCP executes an offsetting securities trade. ASX Clear also faces liquidity exposures from its acceptance of equity collateral against derivatives positions. Specifically, if ASX Clear were to liquidate its equity collateral, it would likely have to wait two days to receive the proceeds of the sale.

The ASX CCPs perform daily liquidity stress tests to assess the adequacy of the CCPs' available liquid resources to cover the largest potential liquidity exposure arising from the joint default of two participants and their affiliates under a range of extreme but plausible scenarios (Cover 2 liquidity target). The CCPs' liquidity stress test framework utilises the same market stress scenarios as the corresponding credit stress tests, but also takes into account additional, liquidity-specific risks.

While ASX Clear manages liquidity across both its cash market and derivatives products, it has defined a target minimum cash market liquidity 'buffer', which was sized at $130 million during the assessment period (see section 2.2.3). Cover 2 cash market liquidity exposures regularly exceeded the buffer over 2019/20, in which case ASX Clear would have had to rely on OTAs (which are essentially liquidity commitments from its participants) to settle any exposures above the buffer (see section 2.2.3). The buffer also implicitly defines a liquidity threshold for ASX Clear's derivatives-market exposures of $350 million. This figure includes an additional $80 million liquidity facility executed by ASX Clear in December 2019. During the assessment period, ASX Clear's derivatives-market liquidity exposures exceeded this threshold on three occasions (see section 2.2.3). ASX Clear (Futures) exceeded its prefunded liquid resources on two occasions (see section 2.2.3).

A liquidity stress test breach at either CCP will, depending on the number and magnitude of the breaches, result in an amber or red rating on ASX's KRIs (see section 3.4.1). A breach of the KRIs will lead to a formal assessment of the breach by ASX management that is then presented to ASX's Clearing and Settlement Boards, including consideration of measures to address the breach. Potential responses to a breach could be to increase the CCPs' prefunded resources, or establish or increase the size of committed liquidity facilities.

Both ASX Clear and ASX Clear (Futures) also face liquidity risk from the reinvestment of pooled prefunded resources and the portion of margin posted by participants in the form of cash. These assets are reinvested and held by ASXCC, the holding company for the two CCPs, according to a defined investment policy and investment mandate. Liquidity risk arises since ASXCC would have to convert its assets into cash to meet any obligations arising from a participant default or for day-to-day liquidity requirements, such as the return of cash margin to participants. To mitigate investment liquidity risk, ASXCC's investment policy requires that a minimum portion of ASXCC's investments must be in liquid assets to meet its minimum liquidity requirements.

Recovery tools

In a highly unlikely scenario that involves more than two large participant defaults or market conditions that are beyond 'extreme but plausible', it is possible that prefunded or other liquid financial resources could be insufficient to fully absorb default-related losses or meet payment obligations. In such circumstances, the CCP may be left with an uncovered credit loss or liquidity shortfall. Each CCP's approach for allocating an uncovered credit loss or liquidity shortfall following a participant default relies on a number of tools:

- *Recovery Assessments*. The power to call for additional cash contributions from participants to meet uncovered losses and fund payment obligations, in proportion to each participant's exposures at the CCP before the default. Recovery Assessments are capped at $300 million in ASX Clear and $600 million in ASX Clear (Futures) (or $200 million for a single default).
- *Variation margin gains haircutting.* A tool, available to ASX Clear (Futures) only, allowing the CCP to reduce (haircut) outgoing variation margin payments to participants in order to allocate losses or a liquidity shortfall arising from a defaulting participant's portfolio. There is no cap on the use of this tool.
- *Settlement payment haircutting*. A reserve power that could be used in the context of complete termination to allocate losses or a liquidity shortfall if the above tools were insufficient. Complete termination would involve tearing up all open contracts at the CCP and settling them at their current market value. Any residual losses or liquidity obligations of the CCP could be allocated by haircutting settlement payments to participants. Use of this tool would have a highly disruptive effect on the markets served by the CCP, so would be considered only as a last resort.

In addition, ASX Clear can address a liquidity shortfall relating to the settlement of securities transactions via the use of OTAs with participants due to receive funds in the settlement batch. Both CCPs also have the power to restore a matched book via partial or complete termination of contracts at their current market value if normal close-out processes cannot be carried out.

ASX has established a staged process for replenishment of the CCPs' default funds in the event that these were exhausted or partially drawn down following a participant default. At the end of a

22-business-day 'cooling-off period' following the management of a default, ASX Clear's and ASX Clear (Futures)' default funds would be fully replenished up to $150 million and $400 million, respectively.

B.4 Activity and Participation

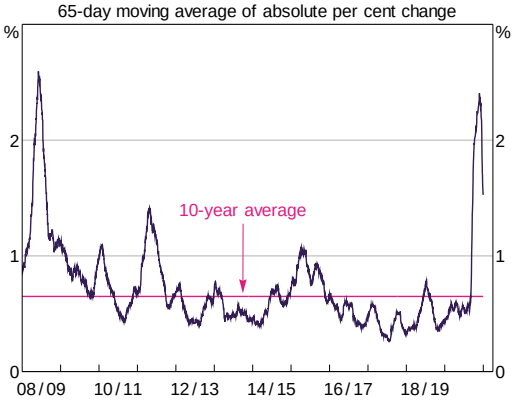
Central counterparties

In line with developments in international markets, Australian market conditions were more volatile during the assessment period, with the average volatility in products cleared by the ASX CCPs higher than during the previous assessment period. Average volatility in equity prices (as measured by the 65-day moving average of daily absolute percentage changes in the S&P ASX All Ordinaries Index) doubled to 97 basis points when compared to the previous year, primarily due to heightened volatility in March following the outbreak of COVID-19 (Graph 8). Volatility in interest rate futures also rose significantly in March, particularly the 90-day bank bill futures and 10-year Treasury bond futures contracts, before returning below their long-term average levels towards the end of the year (Graph 9).

Graph 8

All Ordinaries Market Volatility

65-day moving average of absolute per cent change

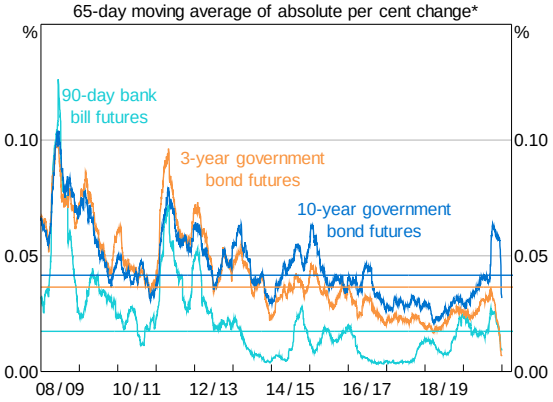


Sources: ASX; Bloomberg

Graph 9

ASX 24 Market Volatility

65-day moving average of absolute per cent change*

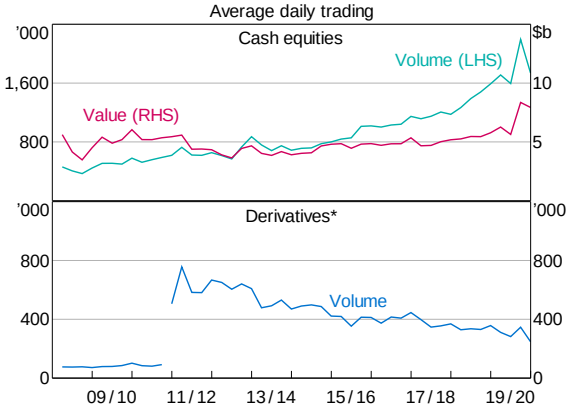


* Horizontal lines indicate the 10-year average for each series

Sources: ASX; Bloomberg

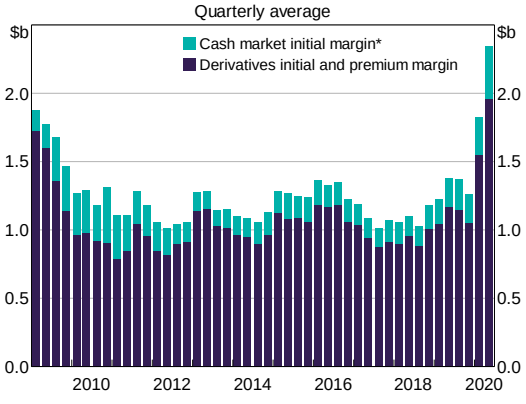
Trading activity in ETOs decreased slightly over 2019/20, while the average value and volume of cash equities traded increased, including a sharp increase in March (Graph 10). Exposures in ASX Clear increased over 2019/20. As measured by initial margin, ASX Clear's exposures in ETOs rose by 32 per cent to an average of $980 million over 2019/20 compared with 2018/19, while exposures to cash equities trades rose by 52 per cent to an average of $269 million (Graph 11). ASX Clear's exposures to the cash equities market are much lower than for ETOs primarily because of the short duration of cash market trades at two days.

Graph 10
ASX Market Trades
Average daily trading



* In May 2011, ASX changed its standard contract size for single stock options to 100 shares per contract from 1,000 shares per contract.
Source: ASX

Graph 11
ASX Clear Margin
Quarterly average

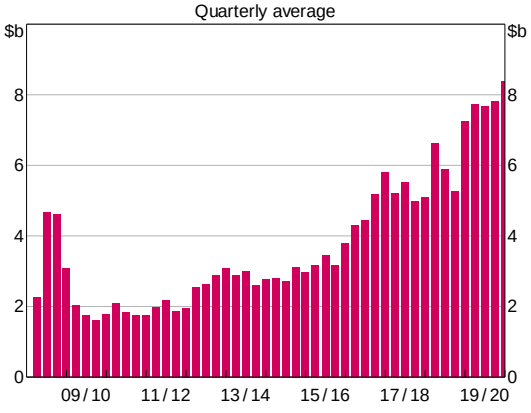


* Notional amount until 7 June 2013; Real Risk methodology used until 18 July 2012, Cash Market Margining used thereafter
Source: ASX

Exposures at ASX Clear (Futures) grew by 26 per cent to $7.9 billion on average, as measured by initial margin held (Graph 12). These exposures primarily arise from the four major contracts cleared – SPI 200 equity index futures, the 3-year and 10-year Treasury bond futures and 90-day bank bill futures – which accounted for around 98 per cent of total transactions cleared at ASX Clear (Futures) in 2019/20. Initial margin increased substantially in March following increases in margin rates charged on SPI 200 futures, as well as increases in margin rates for interest rate futures in late December.

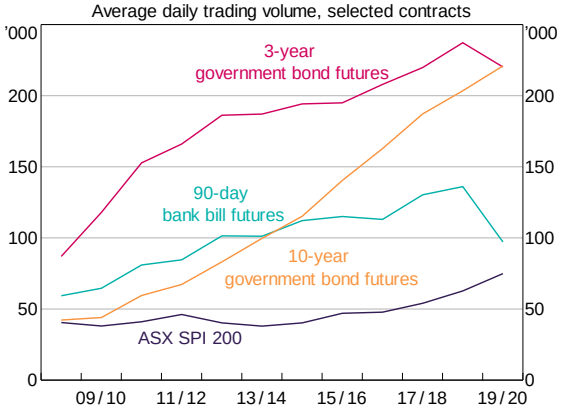
Transaction volumes on ASX 24 experienced mixed growth in 2019/20, increasing across the 10-year Treasury bond futures and SPI 200 futures contracts while decreasing across the 3-year Treasury bond futures and 90-day bank bill futures contracts (Graph 13).

Graph 12
ASX Clear (Futures) Initial Margin
Quarterly average



Source: ASX

Graph 13
ASX 24 Derivatives Trades
Average daily trading volume, selected contracts



Source: ASX

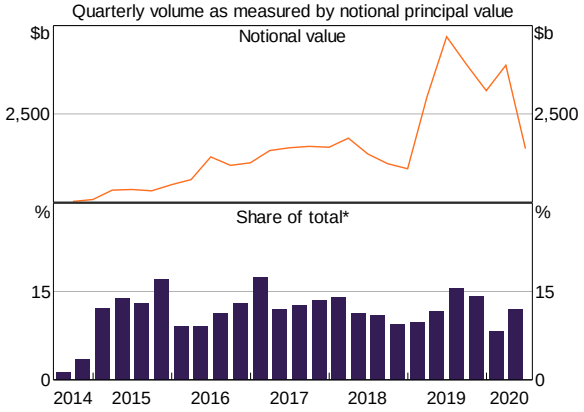
The average daily value of AUD OTC IRDs cleared by ASX Clear (Futures) increased in March before decreasing sharply over the June quarter as volatility in rates markets declined (Graph 14). Despite this decrease, the share of these products cleared by ASX Clear (Futures) increased to an average of 12.5 per cent over 2019/20.

ASX Clear had 33 direct participants as at 30 June 2020. There were 20 direct clearing participants in ASX Clear (Futures).

Graph 14

ASX Clear (Futures):
AUD OTC IRD Trades Cleared

Quarterly volume as measured by notional principal value



* Total includes AUD OTC IRD cleared by ASX Clear (Futures), CME Inc. and LCH Ltd.

Sources: ASX; CME Inc.; LCH Ltd.

Securities settlement facilities

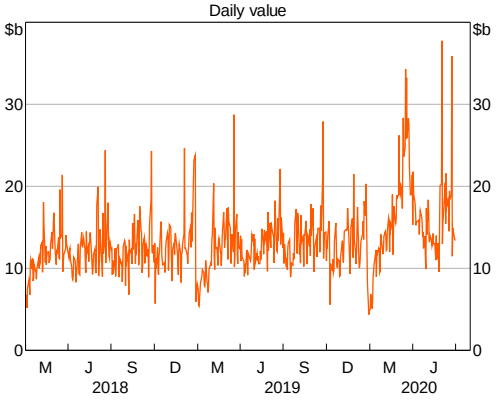
The daily average value of cash equity settlements in ASX Settlement increased by around 17 per cent to $12.3 billion in 2019/20. This is consistent with the growth in cash equities trading activity in the ASX market, albeit trends in net settlement values can deviate from trends in gross trading values, since the latter do not include non-market transactions and netting efficiency can change over time. Peaks in daily activity of above $35 billion occurred in March and June, well above the previous peak of $28.7 billion in March 2019 (see Graph 15). The March peak in daily activity was driven by the settlement of a record volume of 7 million cash equities trades executed across all markets.

In 2019/20, the average daily value of debt securities settled in Austraclear increased by 24 per cent, to $69.5 billion. Daily DvP transactions exceeded the previous peak of $92.2 billion on 15 occasions between March and June, with a maximum value of $113.2 billion being settled on 21 May (see Graph 16). Most of the peak days were driven by the settlement of new bonds issued by the Australian Government.

Graph 15

Net Settlements* in ASX Settlement

Daily value



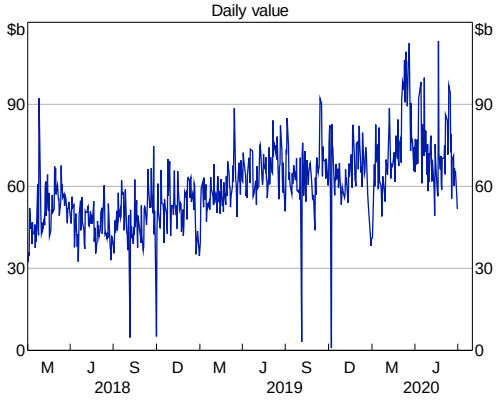
* Both novated and non-novated settlements

Source: ASX

Graph 16

DvP Transactions in Austraclear

Daily value



Source: ASX

B.5 Operational Performance

ASX manages its operational risks in the context of its group-wide ERM Framework, applying consistent operational risk controls across all of its CS facilities. Key operational objectives are minimum availability of 99.8 per cent for Derivatives Clearing System (DCS) and CHESS (99.95 per cent for Austraclear, Genium and Calypso) and peak capacity utilisation of 50 per cent or less. System availability was above target availability for all systems during the assessment period (Table 7). Peak usage was at or below the limit of 50 per cent for all systems except CHESS, where peak usage exceeded 50 per cent on three days during the assessment period.

Table 7: ASX CS Facility System Availability and Usage Statistics for 2019/20

Facility	Core system	Availability (per cent)	Peak usage (per cent)	Average usage (per cent)
ASX Clear	DCS	100	19	7
ASX Clear / ASX Settlement	CHESS[(a)]	100	94[(b)]	39
ASX Clear (Futures)	Genium	100	45	12
ASX Clear (Futures)	Calypso	100	50	41
Austraclear	EXIGO	100	49	26

(a) ASX's Core system is a key system supporting the submission of trades to CHESS. It was available for 100 per cent of the time, with a peak usage of 104 per cent in the assessment period.
(b) The figure represents CHESS systems peak usage based on the capacity testing methodology prior to 13 March.

ASX did not experience any incidents during the assessment period that impacted the availability of CS facility systems. ASX experienced two major incidents during the assessment period that impacted its CHESS system without affecting system availability. On 13 March 2020, CHESS experienced processing delays due to record volumes and a reduction in system performance. ASX was able to defer end-of-day processing of trades to allow it to make system changes to improve processing times before completing the end-of-day process on Saturday 14 March. The deferral of the end-of-day process, combined with a separate operating incident at Chi-X on 13 March, meant that the processing could not be completed until Sunday 15 March 2020.

Appendix C: The Assessment Framework

The October 2020 Assessment sets out the Reserve Bank's assessment of how well ASX Clear and ASX Clear (Futures) have observed the CCP Standards, and how well ASX Settlement and Austraclear have observed the SSF Standards as at 30 June 2020. In setting out its assessment, the Bank has applied the rating system used in CPMI and IOSCO's *Principles for Financial Market Infrastructures: Disclosure Framework and Assessment Methodology*.[22] Under this framework, the Bank has assessed each of the ASX CS facilities' observance of the requirements of each of the applicable FSS as being:

- *Observed* – Any identified gaps and shortcomings are not issues of concern and are minor, manageable and of a nature that the facility could consider taking them up in the normal course of its business.
- *Broadly observed* – The assessment has identified one or more issues of concern that the facility should address and follow up on in a defined timeline.
- *Partly observed* – The assessment has identified one or more issues of concern that could become serious if not addressed promptly. The facility should accord a high priority to addressing these issues.
- *Not observed* – The assessment has identified one or more serious issues of concern that warrant immediate action. Therefore, the facility should accord the highest priority to addressing these issues.
- *Not applicable* – The standard does not apply to the type of facility being assessed because of the particular legal, institutional, structural or other characteristics of the facility.

Section 821A(aa) of the Corporations Act requires that a CS facility licensee, to the extent reasonably practicable to do so, comply with the FSS and do all other things necessary to reduce systemic risk. In assessing how well a CS facility complies with a CCP or SSF Standard, the Bank has assessed how well the facility complies with the headline standard and each of the 'sub-standards' listed under the headline standard. A single overall rating is applied to each CCP or SSF Standard, reflecting this assessment.

The Bank's assessment of compliance with the FSS is based on information gathered through its regular liaison with ASX staff, the supply of regular data and reports by ASX, and a series of specific information requests and meetings with ASX during and immediately following the assessment period.

Supplementary interpretation of CCP Standards

In assessing how well ASX Clear and ASX Clear (Futures) have observed certain sub-standards of the CCP Standards, the Bank has applied the supplementary interpretation of these sub-standards issued by way of an exchange of letters with ASX in October 2014.[23] This supplementary interpretation

22 Available at <http://www.bis.org/cpmi/publ/d106.htm>.

23 This letter is available at <https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/clearing-and-settlement-facilities/pdf/supplementary-guidance-domestic-derivatives-ccps.pdf>.

supersedes the Bank's previous supplementary interpretation of the CCP Standards issued in August 2013. The supplementary interpretation of the CCP Standards applies to any domestically licensed derivatives CCP that provides services to participants that are either established in the EU or subject to EU bank capital regulations, and affects CCP Standards 2.6, 4.2, 4.4, 6.3, 7.3, 13.2, 13.3, 15.4 and 21.

Abbreviations

ADI	authorised deposit-taking institution	ESMA	European Securities and Markets Authority
AIM	additional initial margin	ETO	exchange-traded option
AMO	Approved Market Operator	FMI	financial market infrastructure
APRA	Australian Prudential Regulation Authority	FSS	Financial Stability Standard(s)
ASIC	Australian Securities and Investments Commission	ICC	inter-commodity spread concession
ASXCC	ASX Clearing Corporation	IOSCO	International Organization of Securities Commissions
BAU	business-as-usual	IRD	interest rate derivatives
BoE	Bank of England	KRI	key risk indicators
CBPL	capital-based position limit	MoU	memorandum of understanding
CCMS	centralised collateral management service	MPOR	margin period of risk
CCP	central counterparty	NTA	net tangible assets
CEO	Chief Executive Officer	NZD	New Zealand dollar
CFR	Council of Financial Regulators	OTA	offsetting transaction arrangement
CHESS	Clearing House Electronic Sub-register System	OTC	over-the-counter
CPMI	Committee on Payments and Market Infrastructures	PFMI	Principles for Financial Market Infrastructures
CRO	Chief Risk Officer	PIRG	Participant Incident Response Group
CRQD	Clearing Risk Quantification and Development	PSNA	Payment Systems and Netting Act 1998
CS	clearing and settlement	RBNZ	Reserve Bank of New Zealand
DA	Digital Asset	RCC	Risk Consultative Committee
DCS	Derivatives Clearing System	RQWG	Risk Quantification Working Group
DLT	distributed-ledger technology	RTGS	real-time gross settlement
DMC	Default Management Committee	SPAN	Standard Portfolio Analysis of Risk
DMG	Default Management Group	SSF	securities settlement facility
DMRF	Default Management and Recovery Framework	STEL	stress test exposure limit
DvP	delivery-versus-payment	SWIFT	Society for Worldwide Interbank Financial Telecommunication
ERICA	Enterprise Risk, Internal Audit & Compliance Application	TAS	Trade Acceptance Service
ERM	enterprise risk management	TOSC	Technology, Operations and Security Committee