Assessment of ASX Clearing and Settlement Facilities

September 2021

Contents

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Executive Summary

This report presents the annual Assessment by the Reserve Bank of Australia (the Bank) of the ASX clearing and settlement (CS) facilities, as at 30 June 2021. On balance, the Bank has concluded that the facilities have conducted their affairs in a way that 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 all of the ASX CS facilities.

Scope of assessment

The Assessment covers the four ASX CS facilities: two central counterparties (CCPs) – ASX Clear and ASX Clear (Futures) – and two securities settlement facilities (SSFs) – ASX Settlement and Austraclear. The Bank has assessed the CS facilities' compliance with relevant financial stability standards (FSS) determined by the Bank, as well as the CS facilities' general obligation to do all other things necessary to reduce systemic risk.

Key findings

The Bank's ratings of the ASX CS facilities' compliance against relevant FSS are summarised below.[1]

Standard(s)	ASX Clear	ASX Clear (Futures)	ASX Settlement	Austraclear
Operational Risk	Partly observed	Partly observed (↓)	Partly observed	Partly observed (↓)
Margin	Broadly observed	Partly observed	---	---
Governance Regulatory Reporting	Broadly observed (↓)	Broadly observed (↓)	Broadly observed (↓)	Broadly observed (↓)
Credit Risk Liquidity Risk	Broadly observed	Broadly observed	N/A	N/A
General Business Risk	Observed (↑)	Observed (↑)	Observed (↑)	Observed (↑)
Other applicable standards	Observed	Observed	Observed	Observed

In arriving at these ratings, the Bank took into account the following key developments at the CS facilities:

- *Operational risk:* ASX experienced a major outage to its equities trading platform following an upgrade to a key trading platform, as well as other incidents affecting its trading, clearing and settlement systems in November 2020. An independent expert review of the ASX project to upgrade the trading platform identified several shortcomings that are also relevant to the CS facilities' management of project-related risks.

1 Green = Observed; Orange = Partly Observed; Yellow = Broadly Observed; Grey = N/A. Blue text is used for upgraded ratings and red text for downgraded ratings.

Over the past year, ASX has taken short-term steps to relieve pressure on the capacity of CHESS – ASX's system for clearing, settlement and other post-trade services for the Australian cash equities market – while it progresses work on a replacement system.

- *Governance:* The Bank conducted a detailed review of ASX's governance arrangements, finding:
  - that ASX benefits from a skilled and experienced board. The new Chair of ASX has introduced a number of positive initiatives for governance at ASX
  - that the CS facilities' business and their regulatory and stakeholder obligations do not always receive appropriate attention and focus within the broader ASX Group
  - unclear lines of responsibility and accountability for the operation of the CS facilities
  - gaps in the ASX Boards' access to the skills, experience and understanding needed to supervise ASX's program of technology upgrades, including the replacement of CHESS
  - that ASX should broaden its 'customer' focus to include all stakeholders.
- *Regulatory reporting:* The Bank identified gaps in ASX's processes for notifying the Bank of information in a timely and transparent manner.
- *General business risk:* ASX addressed recommendations made in the Bank's 2020 Assessment to introduce an investment risk capital buffer for the CCPs, and to formalise its arrangements for holding business and operational risk capital at the SSFs.

2021/22 regulatory priorities

The Assessment includes a number of recommendations for the ASX CS facilities to strengthen their observance of relevant FSS, including in relation to:

- addressing the findings of an independent review of the ASX trading platform upgrade project, including to carry across relevant findings to the CHESS replacement project
- strengthening ASX's governance arrangements in line with findings of the Bank's governance review
- managing the risks to the CCPs 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
- aligning financial risk management practices and governance arrangements with international guidance on CCP resilience
- reviewing the legal certainty of the delivery-versus-payment settlement process in CHESS
- addressing remaining constraints to the joint processing capacity of CHESS and the related CORE system, and implementing the CHESS replacement system
- establishing a systematic approach to assessing risks that other entities may pose to the CS facilities, and vice versa
- reviewing the quality controls and systems ASX has in place for notifying the Bank of material developments in a timely and transparent manner.

Over the coming year the Bank will conduct deep-dive assessments of the ASX CS facilities' management of margin and the CHESS replacement system. Other areas of focus will include ASX initiatives to enhance cyber resilience, validation of stress testing scenarios and review of its enterprise risk management framework (ERMF).

1. Summary of Regulatory Priorities

This section summarises actions taken by the ASX CS facilities during the 12 months to June 2021 (the assessment period) in relation to recommendations identified in the Bank's 2020 *Assessment of ASX Clearing and Settlement Facilities* (the 2020 Assessment), and summarises the recommendations identified by the Bank in its 2021 Assessment of the facilities against the FSS. These recommendations are based on the Bank's assessment of the ASX 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), as well as the CS facilities' more general obligation to do all other things necessary to reduce systemic risk. Further detail is provided in section 2, which describes material developments in the CS facilities relevant to the FSS; section 3, which discusses operational incidents affecting the ASX Group; and section 4, which provides the results of detailed assessments conducted by the Bank of the facilities' governance arrangements and framework for the comprehensive management of risks. The Bank conducted this assessment in accordance with its *Approach to Supervising and Assessing Clearing and Settlement Facility Licensees*.[2]

1.1 Progress against 2020 recommendations

In the Bank's 2020 Assessment, the ASX CS facilities were rated 'observed' or 'broadly observed' for all FSS, 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. The 2020 Assessment made recommendations for steps to be taken for the CS facilities to observe or to continue to observe various standards. Table 1 summarises the actions taken by the facilities in relation to these recommendations during the assessment period.

The Bank's 2020 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 2 (see Appendix A for a mapping of these sections to each area of supervisory focus).

1.2 2021 assessment and regulatory priorities

It is the Bank's assessment that the CS facilities 'partly observed' the following requirements under the FSS as at 30 June 2021: [3]

- the Margin Standard (CCP Standard 6) was rated as 'partly observed' in ASX Clear (Futures)

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2 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>.

3 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.

- the Operational Risk Standard (CCP Standard 16, SSF Standard 14) was rated as 'partly observed' in all facilities.

The Bank's assessment is that the CS facilities 'observed' or 'broadly observed' all other relevant FSS requirements as at 30 June (Table 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.[4] However, the facilities will need to place a high priority on addressing the recommendations related to margin and operational risk.

Compared with the 2020 Assessment, the Bank has:

- raised each of the CS facilities' ratings for General Business Risk (CCP Standard 14, SSF Standard 12) to 'observed'
- lowered the rating for ASX Clear (Futures) and Austraclear for Operational Risk (CCP Standard 16, SSF Standard 14) to 'partly observed', reflecting gaps identified in ASX's enterprise-wide operational risk management following the review of recent operational incidents
- lowered the ratings for each of the CS facilities on Governance (CCP and SSF Standard 2) and Regulatory Reporting (CCP Standard 21, SSF Standard 19) to 'broadly observed'.

Table 1: Summary of Progress Against 2020 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: • 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	*Mostly addressed.* ASX has updated its processes and procedures governing the commissioning, reviewing and updating of legal opinions. ASX has established a five-year review process for CS facility operating rules and procedures. Further work is required to ensure this process systematically identifies rules and procedures requiring change. For more information, see section 2.5.
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	CCP Standards 2, 4 and 7	Both CCPs	*Partly addressed.* The ASX CCPs are implementing a multi-year work program to address this recommendation. During the assessment period ASX: • added a new liquidity stress test scenario at ASX Clear and developed a new methodology for including historical periods of stress in the stress tests used at ASX Clear

4 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.

Recommendation	Standard	Facility	Actions
• 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.			• completed work to justify assumptions used in its CCP stress tests regarding the time it would take to close out different types of defaulted participant portfolios • worked on excluding excess collateral from ASX Clear's stress tests, which will continue over the coming assessment period • implemented some further 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. • worked to enhance disclosure and feedback arrangements, which will continue over the coming assessment period. For more information, see Box A and section 2.2.1.
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.	CCP Standards 3 and 12	ASX Clear	*Fully addressed.* ASX has introduced a quarterly assessment of participants' capability to meet their recovery or replenishment obligations at ASX Clear. For more information, see section 2.3.1.
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.	CCP Standards 5 and 6	Both CCPs	*Partly addressed.* ASX Clear (Futures) has developed margin floors and implemented these for major futures contracts. ASX intends to implement margin floors for remaining futures. For more information, see section 2.2.2.
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.	CCP Standards 6 and 12	Both CCPs	*Not addressed.* ASX plans to complete the recommended review during the next assessment period. For more information, see section 2.3.3.
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.	CCP Standard 6	Both CCPs	*Partly addressed.* ASX Clear (Futures) has developed processes to initially collect overnight variation margin in USD and is exploring ways to address risks associated with these processes over time. For more information, see section 2.2.2.

Recommendation	Standard	Facility	Actions
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.	CCP Standard 6	ASX Clear	*Partly addressed.* ASX completed analysis indicating that liquidity add-ons are not necessary for exchange-trade options (ETO) products margined using the CME SPAN model. ASX intends to complete its review for cash equities as part of a broader review of its margin methodology targeted for completion in mid-2022. For more information, see section 2.2.2.
Inter-commodity spread concessions (ICCs). 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.	CCP Standard 6	ASX Clear (Futures)	*Addressed.* ASX completed its analysis, resulting in minor changes to its ICC methodology, and has resumed quarterly ICC reviews. For more information, see section 2.2.2.
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.	CCP Standard 7	ASX Clear (Futures)	*Partly addressed.* ASX Clear (Futures) has commenced an application for Reserve Bank Information and Transfer System (RITS) membership in order to become an eligible counterparty of the Bank. For more information, see section 2.3.2.
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.	CCP Standard 12, SSF Standard 11	ASX Clear and ASX Settlement	*Addressed.* ASX has successfully tested deferring the CHESS batch overnight, with findings from this exercise reflected in its default management arrangements. For more information, see section 2.3.3.
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	*Action not yet required.* No action is required until the CHESS replacement system goes live (expected in April 2023). For more information, see section 2.1.3.
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.	SSF Standard 12	Both SSFs	*Addressed.* An updated non-default risk capital policy requiring that SSFs hold the appropriate level of business and operational risk capital has been approved by the CS Boards. For more information, see section 2.4.

Recommendation	Standard	Facility	Actions
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.	CCP Standard 14	Both CCPs	*Addressed.* The CCPs have implemented additional capital buffers to cover potential shortfalls in investment risk capital. ASX's non-default risk capital policy now requires that this buffer and the split of capital held by each CCP is reviewed monthly. For more information, see section 2.4.
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.	CCP Standard 16, SSF Standard 14	ASX Clear and ASX Settlement	*Partly addressed.* ASX has increased daily capacity in the current CHESS system to 10m trades. Further improvements are planned to related systems so that the end-to-end system can handle this level of trades. ASX has also put in place contingency arrangements to address future extreme increases in volumes. ASX is progressing towards implementing the CHESS replacement system in April 2023. For more information, see sections 2.1.1 and 2.1.2.
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.	CCP Standard 16, SSF Standard 14	All facilities	*Partly addressed.* The ASX CS facilities have continued to embed the use of new systems and processes, including to identify, monitor and manage operational risks at an enterprise-wide level. For more information, see section 2.1.4.
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.	CCP Standard 16	Both CCPs	*Partly addressed.* ASX has established a five-year strategic roadmap for its risk management systems that includes actions to address this recommendation. The first phase of this roadmap is a rebuild of credit stress testing systems due to be completed in 2022. In addition, ASX has completed a review of the systems infrastructure required to support its risk management approach over the long-term. For more information, see section 2.6.2.

Table 2: 2021 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	**Broadly observed (↓)**	**Broadly observed (↓)**	**Broadly observed (↓)**	**Broadly 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	**Observed (↑)**	**Observed (↑)**	**Observed (↑)**	**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 (→)	**Partly observed (↓)**	Partly observed (→)	**Partly 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	**Broadly observed (↓)**	**Broadly observed (↓)**	**Broadly observed (↓)**	**Broadly observed (↓)**

(a) Green = Observed; Orange = Partly Observed; Yellow = Broadly Observed; Grey = N/A (see below). Blue text is used for upgraded ratings and red text for downgraded ratings. 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').

(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. These include recommendations to strengthen governance, operational and financial risk management, and regulatory reporting arrangements. 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: 2021 Recommendations to Observe or Continue Observing the FSS

Recommendation	Standard	Facility
Legal Basis. The ASX CS facilities should enhance their process for five-yearly review of operating rules and procedures to include a systematic process for benchmarking against industry standards and market protocols, and identifying rules and procedures that are redundant or inconsistent, or where changes are otherwise desirable. For more information, see section 2.5.	CCP and SSF Standard 1	All facilities
Governance. ASX should address the recommendations of the Bank's special topic on governance to strengthen its approach to: • embedding financial stability considerations in the CS facilities' strategy and objectives • roles, responsibilities and accountabilities of executives and directors • roles and composition of the CS Boards, including arrangements for non-ASX Limited directors • supervision of technology projects • board policies and processes • managing intragroup conflicts of interest • stakeholder management • board oversight of CS facility compliance with the FSS. For more information, see section 4.1.	CCP and SSF Standard 2	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 A and section 2.2.1.	CCP Standards 2, 4 and 7	Both CCPs
Framework for the comprehensive management of risks. ASX should establish a process to periodically conduct systematic assessments of the range of potential risks other entities may pose to its CS facilities and the risks ASX CS facilities could potentially pose to other entities. For more information, see section 4.2.4.	CCP and SSF Standard 3	All facilities

Recommendation	Standard	Facility
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. This framework should include an appropriate methodology for measuring the degree of procyclicality in the CCPs' risk models. For more information, see section 2.2.2.	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 2.3.3.	CCP Standards 6 and 12	Both CCPs
Late-in-day price movements. The ASX CCPs should put in place arrangements that allow them to monitor and manage exposures 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 2.2.2.	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 implement these add-ons if the review concludes they are needed. For more information, see section 2.2.2.	CCP Standard 6	ASX Clear
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 2.3.2.	CCP Standard 7	ASX Clear (Futures)
Exchange-of-value settlement. ASX Settlement should complete analysis of the legal certainty of powers used to support deferral of the movement of securities if this cannot be achieved on the same day as transfer of cash. For more information, see sections 3.3 and 3.4.	SSF Standard 10, CCP Standard 11	ASX Settlement and ASX Clear
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 2.1.3.	CCP Standard 13	ASX Clear
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 complete work underway to increase the joint capacity of the current CHESS and CORE systems. For more information, see section 2.1.1 and 2.1.2.	CCP Standard 16, SSF Standard 14	ASX Clear and ASX Settlement
Operational incidents. ASX should address findings from the IBM review of the ASX Trade Refresh project, ensuring that any relevant steps are taken to apply lessons learned to its clearing and settlement operations, and in particular to the CHESS replacement program. ASX's assessment of how relevant lessons apply to the CHESS replacement program should be subject to independent external review. For more information, see sections 3.2 and 3.4	CCP Standard 16, SSF Standard 14	All facilities
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 complete its review of the effectiveness of these systems and processes in practice. For more information, see section 2.1.4.	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 2.6.2.	CCP Standard 16	Both CCPs
Regulatory reporting. ASX should review the quality controls and systems it has in place to systematically identify and bring to the Bank's attention information required to be reported to the Bank, and address any gaps identified as part of this review. ASX should ensure that these controls are also in place for its implementation of the Bank's upgraded FMI data collection. For more information, see section 2.6.1	CCP Standard 21, SSF Standard 19	All facilities

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 2021/22 special topic assessments of margin and CHESS replacement, and are summarised in Table 4.

Table 4: 2021/22 Areas of Supervisory Focus

Development	Standard	Facility
Special topics		
2021/22 special topics. The Bank will carry out special topic assessments of the ASX CS facilities' margin arrangements and the CHESS replacement system, with a secondary focus on the facilities' collateral arrangements, exchange-of-value settlement arrangements and SSF central securities depository arrangements.	CCP Standards 5, 6, and 11, SSF Standards 5, 9 and 10	All facilities
Risk management framework. The Bank will monitor how recent developments, including revisions to the CS Boards Charter, ASX's new organisational model and the recommendations of this Assessment, are reflected in the upcoming review of ASX's Enterprise Risk Management Framework and in updates to the underlying frameworks for settlement and clearing risk. The Bank will discuss with ASX how this review process takes into account: • how any gaps in the ERMF contributed to issues experienced in the ASX Trade Refresh project and CHESS replacement program • whether the ERMF worked as intended during those events • any changes that are required to address or support recommendations from the IBM review of the ASX Trade outage and the EY reviews of the CHESS Replacement program.	CCP and SSF Standard 3	All facilities
Planned work by the ASX CS facilities		
CCP Resilience Guidance. Implementation of ASX's plans to address gaps against the CCP Resilience Guidance. For more information, see Box A.	CCP Standards 2, 4, 5, 6, 7 and 15	Both CCPs
Default management and recovery. Implementation of ASX's work plan to enhance its default management and recovery frameworks, taking into account potential gaps identified in the 2019/20 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 Clearing AB 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*	CCP Standards 12, 2, 3, 4, 7 and 14, SSF Standards 11, 2 and 3	All facilities

• 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 periodic audits and improved documentation. For more information see section 2.3.3.		
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 2.1.5.	CCP Standard 16, SSF Standard 14	All facilities
Other		
Stress test severity. The Bank will discuss with ASX how it plans to validate whether its stress scenarios could cover an event of similar severity as the 1987 stock market crash, taking into account differences in the current market environment. For more information, see section 2.2.1.	CCP Standard 4, 7	Both CCPs
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. For more information, see section 2.5.	CCP Standard 14 and SSF Standard 12	All facilities

In addition to the recommendations and supervisory focus, the Bank expects ASX to continually strengthen 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. Material Developments

This section discusses material developments relevant to the ASX CS facilities that have occurred during the 2020/21 assessment period (1 July 2020 to 30 June 2021). Developments between the end of the assessment period and the finalisation of this report on 31 August are noted 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.

2.1 Operational risk

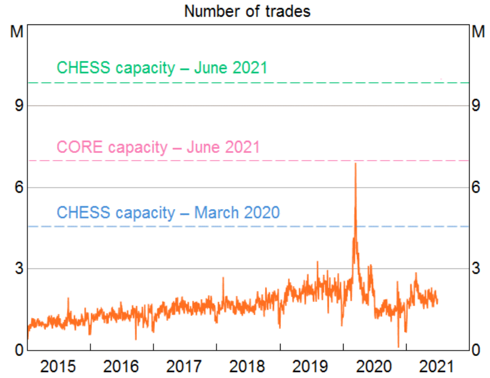
2.1.1 CHESS capacity

CHESS is the system used by ASX to facilitate clearing, settlement and other post-trade services for the Australian cash equities market. The 2020 Assessment recommended that ASX implement measures to increase the capacity of the CHESS infrastructure. These measures were intended to mitigate against the risk of processing delays, such as those experienced in March 2020 when cash equity trade volumes reached around 7 million trades on one day, well above the previous peak of 3.3 million trades.

The program of work to increase the capacity of CHESS was completed in the first half of 2021. CHESS is now able to support 10 million trades per day under business as usual (Graph 1).[5] Work to improve processing capacity has also encompassed ASX's 'CORE' system, which is responsible for feeding trades submitted to the ASX trade platform into CHESS. If the capacity of CORE to process these trades is lower than the capacity of CHESS to absorb them then it may slow the registration of trades on the ASX market to CHESS if trading volumes are sufficiently high.[6] Work to increase the capacity of the CORE system is expected to be completed in the second half of the year.

Graph 1

CHESS Equities Cash Trades



5 CHESS may be able to accommodate higher trade volumes for short periods, for instance by delaying end-of-day processing.

6 Spare capacity in CHESS would, however, remain available to process trades on alternative market operators such as Chi-X or NSX.

The 2020 Assessment also recommended that ASX should develop contingency arrangements to address future extreme increases in volumes that exceed CHESS processing capacity. Over the past year ASX has revised the contingency arrangements intended to help manage these situations and communicated these arrangements to participants.[7] The types of contingency actions available to ASX now include: delaying the start of end-of-the day processes in CHESS (which normally begin at 7:00 pm); limiting the number of trades accepted from market operators; and, under the most extreme circumstances, stopping the registration of all trades for clearing and settlement for a specified period.

2.1.2 CHESS replacement

During the assessment period, ASX continued its work on replacing CHESS. The current system has generally performed well; system availability for CHESS has consistently met its service availability target of 99.80 per cent, with 100 per cent availability of CHESS between July 2020 and June 2021. However, the CHESS software was developed more than 25 years ago. Over time, this legacy system has become harder to maintain and is less flexible than contemporary software.

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. In 2019, ASX and DA partnered with VMware, a large US-based technology firm, to deliver the distributed ledger.

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. ASX will be the only entity that can write to the ledger and it will control access to users, allowing each to see elements of the ledger relevant to them. By contrast, Bitcoin is an example of a public, permissionless DLT system.

Key areas of supervisory engagement

The Bank is working closely with the Australian Securities and Investments Commission (ASIC), the Australian Competition and Consumer Commission (ACCC) and the Treasury to oversee the CHESS replacement program. In October 2020, ASIC and the Bank issued a joint media release that outlined their expectations of ASX.[8] This noted that ASIC and the Bank expected ASX to replace CHESS as soon as this could be safely achieved by ASX and users of CHESS.

At a minimum, ASIC and the Bank expect the new system to meet the requirements that CHESS currently meets for system availability, resilience, recoverability, performance and security. ASX has announced non-functional business requirements for the replacement system that will exceed these minimum requirements. ASIC and the Bank's oversight of the CHESS replacement program is focused on ASX's governance of the program, its engagement with stakeholders, the functional and technical aspects of the replacement system, and its management of the risks associated with the migration to the new system. In particular, ASX will be expected to provide independent assurances to ASIC and the Bank to demonstrate the readiness of the CHESS replacement system before this migration takes place.

Another key input into ASIC and the Bank's supervisory engagement is EY's independent assessments of the governance of the CHESS replacement program. ASX engages EY to undertake these assessments around every six months to provide ongoing visibility of how well the program is functioning.

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7 See: https://www.asxonline.com/public/notices/2020/sept/1164.20.09.html

8 See: https://www.rba.gov.au/media-releases/2020/mr-20-23.html

Go-live delay

In 2020, ASX identified the need to extend the timeline of the CHESS replacement program by at least a year. In late October, following a detailed re-planning process and a period of industry consultation, ASX announced that the target launch date for the CHESS replacement program had been delayed by two years to April 2023. This additional delay was in part driven by industry feedback, which called for more time for industry testing and vendor preparedness as part of the revised plan. It also took into account the impact of COVID-19 on ASX and industry, as well as changes required to support higher trading volumes (discussed below). ASX commissioned EY to conduct an independent review of the revised plan to provide assurance on the re-planning process to its Board and demonstrate how this process had addressed the expectations of ASIC and the Bank that any new timeline should incorporate previous stakeholder feedback and lessons learned from the program, adequate contingency for events that may cause a further delay, as well as sufficient time for users to complete readiness activities.

ASX remains confident that the replacement system will be ready to go live in April 2023. The program is in the final few months of software development, which will incorporate changes to netting and settlement processes. ASX expects that industry testing will begin later this year.

Netting and settlement changes

In light of the surge in trading activity experienced in March 2020, during the assessment period ASX consulted on modifications to the CHESS replacement system to ensure that the new system would be able to be scaled to process higher trade volumes. Under current arrangements, ASX calculates a single 'net broker obligation' (NBO) for each clearing participant each evening, with this replacing the individual trades registered to that participant during the day. However, the NBO process cannot easily be scaled by ASX (either under current arrangements or as part of the replacement system), creating potential delays to time-critical overnight processes that could prevent it from processing much higher volumes of transactions if that were required in the future. Other aspects of the CHESS replacement system are designed to be scalable if this process can be removed.

Following consultation, ASX announced that it would remove the NBO process from the new system. ASX also made a number of amendments to its original proposal to reduce the impact of this change and assist participants in adjusting their internal operational processes, such as providing additional reporting from the new CHESS system that will enable participants to undertake full end-to-end reconciliation.

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 complete work underway to increase the joint capacity of the current CHESS and CORE systems.

2.1.3 Segregation and portability

Under current arrangements, ASX Clear utilises a structure that commingles house and client positions and collateral for cash market transactions. However, the standard on segregation and portability (CCP Standard 13) sets out that a CCP should maintain client positions and collateral in individually segregated accounts or in omnibus client accounts (or equivalent) to enable the segregation of positions and collateral of a participant's clients from that of the participant.[9] ASX Clear currently relies on an exception in the FSS guidance that permits the use of alternative means to provide protection for clients' assets if this protection is materially equivalent to full segregation of client and house positions and collateral. This exception is limited to cash markets and subject to the CCP demonstrating to the Bank that the alternative protections are materially equivalent to full segregation.

The CHESS replacement system is expected to have functionality that can be configured to support either individually segregated or client omnibus accounts. The 2020 Assessment recommended that ASX conduct an assessment of whether the protections from existing client protection arrangements remain materially equivalent to those provided by individual client or omnibus segregation, which should include engagement with industry on the impact of different client segregation operating models. ASX should consult with the Bank and ASIC on the outcome of this assessment within 12 months of the CHESS replacement going live.

Recommendations: 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.

2.1.4 Operational risk management

In 2018, ASX commenced its Building Stronger Foundations program to address the findings of an independent external review of ASX's technology governance, operational risk and control frameworks. The program also incorporated ASX initiatives and projects to improve enterprise risk management and governance practices identified prior to the review. The review was conducted by KPMG at the instigation of the Bank and ASIC.

ASX closed the Building Stronger Foundations program during the previous assessment period, having substantively completed implementation of the review's 36 recommendations. The 2020 Assessment acknowledged the progress ASX had made, but observed that more time was needed to assess the effectiveness of new systems and processes in practice. It recommended ASX continue to embed the use of the new systems it had adopted as part of the program and use these systems to identify, monitor and manage operational risks at an enterprise-wide level.

ASX continued to embed the use of new systems, such as its Enterprise Risk, Internal Audit and Compliance Application (ERICA) and IT Service Management (ITSM) tool over the assessment period. For example, all IT change, incident, problem and knowledge management processes are now managed through the ITSM tool. This has allowed ASX to produce new dashboards and key risk indicator registers that feed into reporting processes for the ASX Boards and executive. ASX expects to continue embedding these new systems over the next year, with further improvements planned for the ITSM tool.

9 Under an individually segregated account structure, each client's positions and collateral are held in a separate account at the CCP, segregated from the positions and collateral of the participant and each other client. Under an omnibus account structure, all positions and collateral belonging to omnibus segregated clients of a particular participant are held together in a single account segregated from the positions and collateral of that participant.

The 2020 Assessment also recommended that ASX internal audit conduct a review of the effectiveness of new systems and processes in practice. ASX internal audit commenced this review during the assessment period. The findings and recommendations of the review will be considered as part of the next assessment, along with any changes that ASX may make in response to the review.

Recommendations: 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 complete its review of the effectiveness of these systems and processes in practice.

2.1.5 Cyber resilience

During the assessment period, ASX continued to implement enhancements to its cyber security practices in line with actions set out in its Cyber Strategy. This included the implementation of measures to improve internal controls and enhancements to its cyber testing regime. ASX also participated in industry forums such as the CPMI-IOSCO industry working group on cyber.

The CPMI-IOSCO *Guidance on Cyber Resilience for Financial Market Infrastructures* provides a set of internationally agreed guidelines for FMIs in the area of cyber risk.[10] Consistent with the expectations set out in the guidelines, 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.

2.2 Financial risk

2.2.1 Credit & liquidity risk

Stress testing

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.

In July 2020, ASX introduced several new stress test scenarios across both CCPs based on the market volatility observed in March 2020. Some of these scenarios introduced more severe equity or interest rate stresses than previous scenarios, extending the boundary of what ASX had previously considered 'extreme but plausible.' The Bank also commenced discussions with ASX on whether it was appropriate to more broadly review the boundary of 'extreme but plausible' stress events in light of the experience in March 2020. In response, ASX initiated a survey of clearing participants within the CCPs' Risk Consultative Committees (RCCs) in order to inform this review. Members were broadly supportive of further increases to certain equity market and interest rate stresses to better capture forward-looking

10 Guidance on cyber resilience for financial market infrastructures (bis.org)

risks. In response, ASX introduced two new equity stress scenarios with larger movements in volume-weighted average prices for the S&P ASX 200. ASX has also introduced two new rates scenarios, one based on possible market movements should the Bank withdraw its target for the three-year Australian Government bond yield and one based on a post-pandemic rise in inflation.

While ASX generally takes into account all historical stress events over recent decades in developing its stress test scenarios, it does exclude the October 1987 stock market crash on the basis that significant changes in market structure and functioning since that time mean that a similar event would not result in such a rapid fall in equity prices currently. A majority of Risk Consultative Committee (RCC) members agreed with this conclusion, although some considered that a 1987 scenario should be included. The Bank will discuss with ASX how it plans to validate whether its stress scenarios could cover an event of similar severity as the 1987 stock market crash, taking into account differences in the current market environment.

ASX also presented a new methodology for determining historical stress scenarios at ASX Clear, which includes a suite of 296 historical scenarios based on periods of macroeconomics stress over the past 30 years. The new methodology assumes the default occurs at the point that would have realised the worst loss under each historical scenario. A key objective of this methodology is to incorporate both systemic and idiosyncratic stresses consistent with the definition of ‘extreme but plausible’. The introduction of these scenarios remains contingent on the completion of the rebuild of ASX’s credit stress testing systems.

Collateral concentration limits

During the assessment period, ASX conducted further analysis in response to a recommendation made in the IMF’s 2018 assessment of the supervision, oversight and resolution planning of Australian FMIs, that ASX should apply concentration limits to equity collateral provided to meet margin obligations at ASX Clear. The analysis found only a small number of instances where a participant’s posted collateral exceeded certain concentration thresholds. In these instances, ASX deemed it would be able to cover its exposure in the event of a default without crystallising concentration risk.

In addition, ASX has developed a dashboard that allows it to monitor concentration in security collateral on a real-time basis. The dashboard has been functional since October. The dashboard does not place any restriction on the amount of individual equity securities that a clearing participant can pledge as collateral. However, ASX plans to introduce additional haircuts in stress test exposure calculations for collateral holdings that exceed a predetermined concentration threshold, which will disincentivise participants holding concentrated positions in particular securities.

Treatment of excess collateral

ASX Clear currently allows clearing participants to withdraw excess collateral posted against their position at any time during the day, and therefore there is no guarantee that this collateral will be available to meet losses in the event of a default. Since stress scenarios are intended to estimate potential losses that could be incurred in the event of default, the 2018 Assessment recommended that ASX should remove the assumption made by ASX Clear that excess collateral will not be withdrawn or decreased during periods of stress. This would align ASX Clear’s approach with the CPMI-IOSCO CCP Resilience Guidance. Current ASX systems do not support the ability to exclude excess collateral from stressed exposure calculations. ASX aims to fully address this recommendation as part of the rebuild of its credit stress testing systems.

Box A: Progress implementing CCP Resilience Guidance

In July 2017, CPMI-IOSCO published its CCP Resilience Guidance, which provides further guidance for CCPs on the financial risk management aspects of its Principles for Financial Market Infrastructures (PFMI). 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 and concluded that they were either consistent or broadly consistent with the CCP Resilience Guidance.

To achieve full consistency with the 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. This box summarises ASX's key work to address these items over the assessment period.

- In July 2020, both ASX CCPs incorporated haircuts to the value of liquid assets in their liquidity stress testing (LST) methodology to better estimate available liquid resources in extreme but plausible market conditions.
- In July 2020, ASX finalised enhancements to its model validation process for both CCPs, confirming that: the findings of its model validation exercise receive board-level approval; the model validation process is independently reviewed; and ASX's Model Validation Standard is reviewed and approved by the CS Boards.
- In July 2020, ASX included revised key risk indicators (KRIs) for Cover 2 breaches in ASX's Risk Appetite Statement.[11]
- In July 2020, ASX introduced a new liquidity stress scenario at ASX Clear with a larger shock to market volatility than had previously been considered. This was an interim step towards ensuring that all credit stress test scenarios used at ASX Clear are also included in its liquidity stress tests.
- In December 2020, ASX completed an assessment of the liquidity risks that the ASX CCPs could face in the event of a RITS outage. It concluded that these risks could be managed via Austraclear's 'Assured Mode', which provides deferred settlement of both incoming and outgoing payments until RITS is operating again.
- In March 2021, ASX implemented margin floors for major products at ASX Clear (Futures) to help reduce the likelihood of procyclical changes in margin levels for these products (see section 2.2.2).
- Over the first half of 2021, ASX completed work to justify the assumptions used in its CCPs' stress tests regarding the time it would take to close out a defaulted participant's portfolios of cash equities, over-the-counter (OTC) derivatives and exchange-traded derivative (ETD) products. Work to ensure consistency between these assumptions and those used in the CCPs' margin models is expected to continue over the next assessment period.
- ASX developed a new methodology for including historical periods of stress in the stress tests used at ASX Clear (see section 2.2.1). Further work to refine and implement this methodology, and develop theoretical and hypothetical stress test scenarios for ASX Clear, is expected to continue over the next assessment period.
- ASX advanced work at ASX Clear to exclude excess collateral provided by participants from its stress testing outcomes, and also establish haircuts for concentrated collateral positions (see section 2.2.1). Work in this area is expected to continue over the next assessment period.

11 A CCP must seek to maintain pre-funded financial resources sufficient to cover a default of any two of its participants (and their affiliates) in extreme but plausible market conditions – a requirement known as 'Cover 2'.

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.

2.2.2 Margin

Anti-procyclicality measures

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 (Box B), 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. There may be other sources of procyclicality in CCP risk management models – for instance, where haircuts applied to collateral posted by participants are calibrated to increase in times of market stress. The 2018 Assessment identified ASX's lack of a systematic approach to assessing and mitigating the potential for procyclical changes as a weakness in its risk management framework.

During the assessment period, ASX Clear (Futures) implemented a new methodology for setting margin floors for its major exchange-traded derivative contracts. It plans to extend the methodology to the remaining contracts in coming months. Under the new methodology, ASX calibrates margin floors with reference to the most volatile five-year period over the period for which price history is available for each futures contract (up to 22 years). While the margin floors are calibrated using a confidence level of at least 99 per cent, the exact choice of confidence level is subject to management discretion. ASX has also applied expert judgement to adjust margin floors for interest rate futures contracts that it has deemed affected by the Bank's Australian Government Securities (AGS) yield target.[12] The margin floors

12 This includes the 3-year AGS futures, 90-day bank bill futures, and 30-day interbank cash rate futures contracts.

are reviewed quarterly and subject to oversight by the CS Boards, with any changes to the methodology for setting floors requiring approval by the CS Boards.

While the implementation of margin floors for major contracts at ASX Clear (Futures) reduces the risk of destabilising increases in margin for these contracts during periods of heightened market volatility, it does not constitute the systematic procyclicality framework needed to reduce this risk across all margin and financial risk requirements at the ASX CCPs. In particular, such a framework should cover margin floors or other anti-procyclicality measures for all remaining contracts at both CCPs, as well as non-margin risk requirements such as collateral haircuts. The framework should include an appropriate methodology for measuring the degree of procyclicality in risk models to allow management and the boards of ASX's clearing and settlement facilities (CS Boards) to assess the adequacy of anti-procyclicality tools employed by the CCPs (such as floors on margin requirements and collateral haircuts).

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. This framework should include an appropriate methodology for measuring the degree of procyclicality in the CCPs' risk models.

Box B: International work on margin practices

In November 2020, the Financial Stability Board (FSB) published a holistic review of the pandemic-related market turmoil that took place during March 2020.[13] One finding of the report was that some non-bank financial intermediaries (NBFI) experienced liquidity stress during the period, in part driven by margin calls. As part of its work program to enhance the resilience of NBFIs, the FSB is now working together with the Basel Committee on Banking Supervision (BCBS), CPMI and IOSCO to examine issues around margin during the early stages of the pandemic. These international bodies have formed a group to carry out a data-driven analysis of margin during the March 2020 market turmoil, covering issues such as:

- margin in cleared and uncleared markets, including clearing member-client dynamics
- the transparency, predictability and volatility of margin practices across markets, jurisdictions and margining models
- the preparedness of market participants to meet margin calls.

As a CPMI member, the Bank has been contributing to the group's work, in particular the workstream analysing the margining practices of CCPs. To support its analysis, the group initiated surveys to various groups including CCPs, banks, non-bank intermediaries and clients. The final results from the group's work will feed into a November FSB report to the G20 on lessons learned from the COVID-19 episode. The Bank will consider these findings and recommendations in its ongoing supervision of the ASX CCPs.

13 See <https://www.fsb.org/wp-content/uploads/P171120-2.pdf>

Late-in-day and overnight price movements

The elevated market volatility of March and early April 2020 highlighted the potential for large variation margin exposures to build up late in the day and overnight when neither CCP currently calls variation margin. 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.[14] 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 2020, 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. In the absence of an overnight variation margin call, ASX Clear (Futures) participants that are active during the overnight session are required to post additional collateral to cover potential adverse price movements overnight.

The 2020 Assessment recommended that the ASX CCPs should monitor and manage exposures arising from late-in-day and overnight price movements. At the time, it was observed that ASX Clear (Futures) had begun monitoring exposure from overnight price movements, in line with recommendations made in previous assessments. During the assessment period, ASX Clear (Futures) has investigated options for collecting overnight variation margin and plans to implement the initial phase of a multi-phase plan over coming months. ASX Clear (Futures) is not able to use its normal process for collecting variation margin overnight, since Austraclear and RITS which are typically used to settle security and AUD cash collateral, are closed during this time. More broadly, there are currently a number of obstacles to ASX Clear (Futures) collecting margin payments overnight in AUD at the scale required to accommodate potentially large variation margin obligations.

ASX Clear (Futures) therefore proposes to initially collect overnight variation margin in USD, to be paid by participants to one of three commercial settlement banks, in line with its current arrangements for collecting overnight initial margin. However, this approach involves a credit exposure to the commercial settlement bank until the first intraday margin run in AUD the next morning. Losses from the default of a commercial settlement bank would be borne by a combination of ASX Clear (Futures) and its participants in accordance with arrangements for investment loss allocation under the ASX Recovery Rules. ASX Clear (Futures) is also exploring alternative ways to collect overnight variation margin that do not involve credit exposure to commercial banks, such as using US Treasuries or settlement in exchange settlement balances using the New Payments Platform.

ASX has prioritised work on addressing exposure to overnight price movement in ASX Clear (Futures). Accordingly, neither CCP has made further progress in implementing arrangements to monitor and manage exposures arising from late-in-day price movements.

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.

14 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.

Inter-commodity spread concessions

The 2020 Assessment recommended that ASX Clear (Futures) should complete analysis of the costs and benefits of changing its methodology for calibrating ICCs in its SPAN margin model and resume regular reviews of ICCs, which had been suspended pending review of the methodology. ICCs allow for a reduction in CCP participants' initial margin requirements where offsetting positions are held in contracts that have a significant and reliable correlation in prices. However, such margin offsets may exacerbate losses in the case of a clearing participant default if the assumed correlation breaks down. In September 2018, margin offsets contributed to losses sustained by Nasdaq Clearing AB after the default of a clearing member.

During the assessment period, ASX Clear (Futures) completed its analysis and made minor changes to its methodology. The ICC methodology was updated in December 2020 to extend the lookback period for calibrating ICCs and quarterly ICC reviews have resumed, addressing this recommendation.

Liquidity add-ons

The 2020 Assessment included a recommendation for ASX Clear to implement a margin add-on that accounts for liquidity risk in cash market products and ETOs (which are margined using the CME SPAN model). ASX has completed its review of liquidity add-ons for ETOs, but is yet to begin its review for cash market products.

ASX concluded that add-ons are not currently needed for ETOs. This was based on its analysis (incorporating the results of a survey of major market participants), which indicated that auction demand for a defaulting participant's portfolio would be strong enough that initial margin would be sufficient to cover any losses, even under stressed market conditions. ASX will conduct regular analysis in future to assess the need for liquidity add-ons for ETOs. ASX plans to complete its review of liquidity add-ons for cash market products as part of a broader review of margin methodology, targeted for completion in June 2022.

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

2.3 Default management and recovery

2.3.1 Recovery and replenishment arrangements

In the 2020 Assessment, the Bank recommended that ASX should assess the risk that ASX Clear participants could default on their obligations or choose to resign as participants in the face of possible difficulty meeting their recovery or replenishment obligations. Meeting these obligations 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. It was also noted that ASX should formalise arrangements to conduct an evaluation of these risks on a periodic basis and formalise any resulting risk management actions.

Recovery assessments are called from participants to cover the CCP's losses from a participant default once all other prefunded financial resources have been exhausted, while replenishment contributions are called to restore the resources in the default fund once it has been depleted below a certain threshold.[15] Failure to meet a recovery assessment is an event of default, while the ASX Recovery Rules allow participants to resign before any obligation to replenish the default fund becomes due. To address the Bank's recommendation, ASX assessed each ASX Clear participant's capacity to meet its maximum recovery assessment and replenishment contribution obligations based on a comparison of these obligations to the participant's capital and liquidity resources. To assess each participant's likelihood of resigning in the event of a potential replenishment contribution, ASX carried out additional analysis of the profitability of each participant's clearing business relative to its possible replenishment obligations. It also analysed a range of other qualitative factors such as support from the group structure for participants that are subsidiaries and business growth potential.

ASX's analysis did not indicate any material concerns regarding participants' capacity to meet their recovery obligations. It further suggests that only a limited number of smaller participants may choose to resign rather than pay their replenishment contributions. The financial impact from the resignation of five participants deemed to be moderately or highly likely to do so is estimated to be $8.9 million, representing around 12 per cent of the aggregate replenishment amount.[16] ASX will conduct a similar study on a quarterly basis going forward.

2.3.2 Access to liquidity facilities

The 2020 Assessment recommended that ASX Clear (Futures) take steps to establish an ability to access liquidity from the Bank in respect of a defaulting participant's non-cash collateral. Currently ASX Clear (Futures) can access liquidity via the market in respect of all collateral that it collects. However, its access to liquidity from the Bank is limited to cash collateral, where this cash is invested in eligible assets via ASX Clearing Corporation (see Appendix [B.3]). The particular issue is that currently, it is ASX Clearing Corporation that is a member of RITS and an eligible counterparty of the Bank's domestic market operations, but the terms of the trust governing ASX Clear (Futures)' arrangement with ASX Clearing Corporation do not allow the latter to receive non-cash collateral posted to the CCP, meaning that these securities cannot be used to access liquidity from the Bank.

During the current assessment period, ASX Clear (Futures) has taken steps to apply for membership of RITS in its own name, so that it can become an eligible counterparty of the Bank. This would allow ASX Clear (Futures) to directly access liquidity from the Bank in respect of a defaulting participant's non-cash collateral in the event that it was unable to liquidate this collateral on market in a timely manner.

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.

15 ASX Clear may call up to $300 million in recovery assessments from participants immediately following a default that is expected to exhaust prefunded financial resources, and up to $75 million in replenishment contributions within 22 business days of a default.

16 In aggregate, provided participants resign prior to calling of replenishment contributions, ASX Clear would still receive the same level of replenishment contributions, redistributed amongst the remaining participants.

Box C: Multi-CCP fire drill

Over 26–28 April, ASX Clear (Futures) participated in a 'multi-CCP fire drill' exercise to identify possible challenges that CCPs and their participants could face if a major clearing participant were to default at several CCPs at once. The drill focused on a default involving interest rate derivatives and included CCPs and regulators located in Asia, Europe and North America. For ASX, the defaulting position was designed to be representative of a portfolio of a major OTC derivatives clearing participant, which included over 2,000 OTC interest rate derivative trades.

The exercise assumed that the default took place at 4:00 pm Sydney time on Monday 26 April. ASX implemented its default management plan in two substantive phases. In the first 'hedging phase', ASX established an initial macro hedge using Treasury bond futures contracts to reduce the overall interest rate risk of the portfolio. This initial hedging process was completed by 4:30 pm. By 6:00 pm ASX assembled an in-person meeting of its Default Management Group of expert traders seconded from participants, which advised on more targeted hedging strategies using both futures and OTC derivative positions. This resulted in the ASX Default Management Committee approving additional transactions, which were subsequently agreed to with counterparties by 8:15 pm.

At 8:00 am on 27 April, OTC clearing participants were provided with details of the defaulting participant's hedged portfolio. ASX requested that participants provide 'control valuations' by 5:00 pm the same day, along with a reconciliation back to an indicative valuation provided by ASX. The objective of this step was to test that all trades in the auction portfolio were correctly loaded into participants' systems and priced accordingly.

On 28 April, ASX implemented the second phase of its default management plan, which involved auctioning the hedged portfolio off to its OTC clearing participants. Auction details were distributed to participants at 9:00 am, and bids were successfully received from all of ASX's OTC clearing participants in the following 15 minutes. Pricing throughout the exercise was designed to reflect a stressed market environment consistent with the experience of March 2020.

The exercise provided ASX with an opportunity to test its default management procedures and highlighted opportunities for improvements to ASX's initial hedging strategies, internal operational procedures and participant engagement practices in a real-life default scenario. ASX will develop and implement measures to address these learnings as part of its ongoing work on default management.

2.3.3 Other default management developments

Deferral of the CHESS batch

The 2020 Assessment included a recommendation that ASX should test the process of deferring the CHESS batch overnight and review the implications of this approach for default management. During the assessment period, ASX addressed this recommendation via a simulation exercise, in which ASX successfully cancelled all settlement obligations on a given settlement day and then rescheduled the obligations to the next settlement day.

Under current arrangements, ASX would only use this approach if a payment provider defaulted after the batch had commenced. If the default happened before then, only the obligations of the participants affected by the defaulting payment provider would be rescheduled. ASX has identified potential extensions of this fire drill to further inform its default management arrangements.

Margin period of risk assumptions

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 required to close out such a portfolio being longer than the time that is assumed in a CCP's margin models – the 'margin period of risk' or MPOR. The 2020 Assessment found that ASX had not completed a systematic review of the consistency between its MPOR assumptions and its operational capacity to liquidate portfolios across all asset classes. ASX plans to complete this review over the next assessment period.

Recommendation: The ASX CCPs should review whether their 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.

Other areas of supervisory focus

The 2020 review of ASX's default management and recovery framework highlighted a number of gaps which ASX has worked to address over the assessment period.

- ASX has committed to continue increasing the complexity and comprehensiveness of scenarios and coverage of default management processes that are tested in fire drills. Enhancements to fire drills will be undertaken by ASX's internal Default Management and Recovery Working Group (DMRWG), which provides oversight of the CCPs' default management and recovery framework.
- ASX will complete a gap analysis against the CPMI-IOSCO paper *Central Counterparty default management auctions – Issues for consideration* by September 2021. [17]
- ASX has updated its approach for determining default loss estimates and has added this to its Default Management Strategy Book. The default loss estimate represents ASX management's best estimate of the CCPs' potential losses on the participant's portfolio. The size of the default loss estimate provides the criteria for escalation to the Board and the participant RCCs, for decisions regarding whether to take recovery actions, and is used to inform decision-making by ASX's Default Management Committee (DMC). ASX has updated the calculation methodology to include additional information on the circumstances surrounding a participant default (for example whether the default was caused by an idiosyncratic event or a general economy-wide event) and the complexity of the defaulting participant's portfolio.
- ASX Internal Audit has confirmed to the Bank that it will review ASX's default management framework every three to five years, with the first review to take place in 2022/23. The scope of the audit will review the process by which the framework was developed and whether it has been implemented in accordance with the framework. ASX's Internal Audit team decided to defer such an audit until ASX's clearing risk management team had completed the implementation of enhancements identified during the 2015 default of BBY Limited. These enhancements are now substantively complete.

17 Available at < https://www.iosco.org/library/pubdocs/pdf/IOSCOPD657.pdf>

- The Bank and ASX plan to progress a review of the legal certainty of arrangements for ASX Limited to replenish contributions to the ASX CCPs' default funds. This review will be planned alongside the Bank's review of the ASX Group Support Agreement (see section 2.5).

2.4 Business and investment 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. The 2020 Assessment identified that, while the relevant capital had been transferred from ASX Operations to each of the CS facilities, some gaps remained in the arrangements for CCP investment risk capital and SSF business and operational risk capital.

CCPs

The CCPs' cash margin and default fund contributions are invested in a common pool held by ASX Operations. ASX Operations originally held a $75 million portion of capital to cover investment risks across both CCPs. ASX Operations has since 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. Retained earnings of the CCPs can be used to cover a shortfall if the actual proportion of a CCP's contribution to pooled investments differs from this average ratio on the day an investment loss occurs. However, the 2020 Assessment identified that these may not always be sufficient and recommended that a buffer is established along with a process for periodic recalibration.

ASX has addressed this potential shortfall by establishing additional investment risk capital buffers in each CCP made up of paid-up equity. The buffer is calibrated to cover the maximum shortfall since July 2018. ASX's non-default risk capital policy, approved in June 2021, requires that the split of capital held by each CCP is reviewed monthly and that any necessary adjustments to the buffers are made. ASX has also established additional business and operational risk capital buffers equal to 10 per cent of the capital held for this purpose at each CCP.

SSFs

While the 2020 Assessment identified that the amount of business and operational risk capital held by the SSFs was consistent with the requirement under SSF Standard 12, the ASX and CS Boards had not updated their capital policy to reflect this. While any transfer of capital back to ASX Operations would require Board approval, such a transfer would have been permitted under the capital policy, potentially allowing the capital held by the SSFs to fall below the requirement under the SSF Standard. The 2020 Assessment recommended that ASX's capital policy be updated to reflect the new capital arrangements and provide a mechanism for ASX to review whether the level of capital held at the SSFs remains appropriate over time. The new non-default risk capital policy approved by the CS Boards in June addresses this recommendation.

2.5 Legal basis

The 2020 Assessment carried forward two recommendations first identified as part of the 2019 special topic on the legal basis standard.

- *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 updated these guidelines to take into account feedback provided by the Bank.

- *Establish a periodic review of operating rules and procedures*. The 2019 Assessment recommended 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. During the assessment period ASX implemented a process for conducting a five-year rolling review of rules and procedures. The process aims to:
  - identify any changes required to mitigate systemic risk to the ASX CS facilities or respond to issues of importance to key stakeholders (e.g. customers and regulators)
  - benchmark new and existing rules and procedures against other CS facilities and industry standards
  - consider feedback received from participants in relation to rules and procedures that are unclear or confusing
  - update rules and procedures that ASX has identified as redundant or inconsistent, or where changes are desirable or processes in the rules can be improved.

  However, this last element of the rule review process relies on issues being identified and logged as part of ASX Legal's ongoing work. It does not include any systematic process for proactively identifying rules, procedures or processes requiring change if these are not reviewed by ASX Legal in the course of other work. Similarly, the benchmarking of rules and procedures against other CS facilities and industry standards is undertaken only in relation to rule changes that have already been identified as necessary for other reasons, although ASX does monitor regulatory developments that may impact the rules and procedures of the CS facilities more broadly.

During the assessment period ASX also completed work on enhancing, formalising and documenting its business-as-usual controls for legal risks, in line with an area of supervisory focus raised as part of the 2019 special topic. The Bank plans to re-engage with ASX on a planned review of its Group Support Agreement once any amendments arising from recent changes to its intra-group capital arrangements (see section 2.4) have been implemented.

Recommendation: The ASX CS facilities should enhance their process for five-yearly review of operating rules and procedures to include a systematic process for benchmarking against industry standards and market protocols, and identifying rules and procedures that are redundant or inconsistent, or where changes are otherwise desirable.

2.6 Other developments

2.6.1 Data and reporting developments

During the assessment period, the Bank has observed some deficiencies in ASX's data capabilities and quality controls. ASX had identified a breach of its regulatory reporting obligations under the FSS after failing to detect a reporting error for several months. While the Bank views this breach as minor, together with some other data-related lapses it highlights an ongoing issue with ASX's data reporting and internal quality controls. ASX has generally kept the Bank informed of material developments at the CS facilities, but in a few instances important information was not brought to the Bank's attention in a timely and transparent manner.

ASX identified a number of control improvements in response to its identified reporting breach, including:

- introducing an assessment of the potential impact on regulatory reporting from any proposed changes to systems used in meeting data reporting requirements under the FSS
- independent review of data reports by separate functions
- introducing an ongoing assessment of regulatory reporting risks.

Recommendation: ASX should review the quality controls and systems it has in place to systematically identify and bring to the Bank's attention information required to be reported to the Bank, and address any gaps identified as part of this review. ASX should ensure that these controls are in place for its implementation of the Bank's upgraded FMI data collection.

Box D: Enhanced FMI data reporting

The Bank is undertaking a project to improve the quality, scope and timeliness of its data collection on the activities and risks of systemically important CS facilities. These data help the Bank assess how well CS facilities observe the FSS and inform the policy advice given to the Payments System Board (PSB). The Bank and ASX are working closely together on the project as it applies to the ASX CS facilities. Although the project involves upfront investment, the enhanced collection is necessary to support the Bank's supervisory role and will result in a more efficient process for both the ASX and the Bank.

The FMI data project will improve the collection of data by:

- harmonising the Bank's data collection with international practices to reduce the reporting burden for CS facilities that operate in multiple jurisdictions
- increasing the frequency of collection so that the Bank can more readily identify emerging risks and focus its supervision resources where needed
- modernising how data are collected to enable CS facilities to automate reporting and reduce their ongoing reporting burden.

2.6.2 Risk systems

The Bank's 2019 Assessment recommended that 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. This recommendation was introduced in light of ASX implementing new functionality via ad-hoc systems where, in some cases, its core systems lacked support for more sophisticated risk management functions.

In 2018 ASX established a five-year strategic roadmap for its risk management systems that included actions to address this recommendation. The first phase of this roadmap is a project to rebuild the CCPs' credit stress testing systems, which will support the introduction of a range of risk management enhancements, such as functionality that would enable intraday stress testing. In addition, ASX has completed a review of the systems infrastructure required to support its risk management approach over the long-term. ASX will share this analysis with the Bank later in the year.

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.

2.6.3 Cross-border regulatory developments

Brexit

Following the exit of the United Kingdom (UK) from the European Union (EU) on 31 January 2020, the UK entered a transition period that ended on 31 December 2020. During this transition period FMIs operating in the UK continued to be governed by the EU regulatory regime. When the transition period ended, FMIs operating in the UK became subject to the UK regulatory regime and the UK's Temporary Recognition Regime (TRR) for CCPs came into effect. The TRR allows eligible non-UK CCPs that were recognised under the EU regulatory regime to continue to provide clearing services and activities in the UK until 31 December 2023. If required, the UK Treasury can extend the TRR by increments of up to 12 months.

Both ASX CCPs entered the TRR when it came into effect, and accordingly were taken by the Bank of England (BoE) to be eligible for temporary deemed recognition in the UK. Both ASX CCPs formally applied to the BoE in March 2019 to maintain recognition in the UK.

European Union

The EU is in the process of implementing a set of changes to its regulation on OTC derivatives, CCPs and trade repositories, known as European Market Infrastructure Regulation (EMIR) 2.2. EMIR 2.2 updates the EU's approach to the recognition and supervision of third-country CCPs, including ASX Clear and ASX Clear (Futures). Under the new regime, the European Securities and Markets Authority (ESMA) is required to review the recognition of the ASX CCPs, and assign them to a tier based on their degree of systemic importance to the EU by March 2022. The tiering decision will affect the degree of oversight that ESMA applies to the CCPs under EMIR 2.2.

New Zealand

ASX Clear (Futures) was designated as a settlement system under the *Reserve Bank of New Zealand Act 1989* (RBNZ Act) on 14 August 2020.[18] Designation provides ASX Clear (Futures) with additional settlement finality protections under the RBNZ Act.

In May 2021, the New Zealand Parliament passed legislation establishing reforms to the regulatory regime governing FMIs in New Zealand. While ASX Clear (Futures)' designation under the RBNZ Act remains in place during a transitional period, a re-designation process will be undertaken under the new regime prior to the repeal of the designation provisions of the RBNZ Act. The re-designation of ASX Clear (Futures) is anticipated to occur by the end of 2022.

18 The RBNZ Act defines settlement systems broadly, in a way that encompasses ASX Clear (Futures)' activities as a derivatives CCP.

3. Operational Incident Management

3.1 Background

ASX experienced a number of operational incidents in the assessment period. The most serious of these occurred in the week of 16 November 2020:

- ASX detected that some orders on the ASX market were not being reported correctly following the opening of trading on 16 November. This was the first day of trading following a major upgrade to ASX's equity trading platform, ASX Trade. ASX took the decision to close the market for the remainder of the day while it investigated the problem. The issue was caused by problems associated with Tailor Made Combinations (TMCs), an order type that allows trades across multiple securities and derivatives to be executed simultaneously. The market reopened the next day with TMC functionality disabled, although this functionality was partially re-enabled in December.
- ASX closed its Centre Point order matching service for close to a week after experiencing two issues on 16 and 17 November. The first issue affected ASX's processing of the price feed from Chi-X Australia Pty Ltd (Chi-X) that ASX and Chi-X participants rely on in order to ensure that they are meeting best execution requirements under ASIC's market integrity rules. The second issue resulted in certain Centre Point orders interfering with the ability of participants to cancel ASX orders in bulk.
- On 17 November, the completion of the CHESS settlement batch was delayed from around 1:00 pm to 5:40 pm after an unscheduled database process caused settlement to freeze prior to the completion of the delivery-versus-payment (DvP) settlement process. The CHESS end-of-day processing of trades commenced at 8:00 pm, one hour later than usual.

ASIC and the Bank maintained close engagement with ASX throughout the series of incidents experienced in the week of 16 November and in the weeks that followed. While the most significant disruptions during the week impacted ASX's trading operations rather than the clearing and settlement facilities, the Bank has taken a close interest in all of the operational disruptions. ASX takes a group-wide approach to operational risk and project management, which means operational issues affecting ASX's trading platform can have implications for its clearing and settlement operations. Accordingly, the Bank has engaged with ASIC and ASX to fully understand the underlying causes of these events, as well as whether there are any underlying systematic issues that contributed to the incidents.[19]

3.2 Review of ASX Trade Refresh project

Following the outage on 16 November, ASX commissioned IBM to undertake an independent expert review of the ASX Trade Refresh project. The review examined:

[19] Other operational incidents experienced during the assessment period included problems associated with the launch of a new website in October, and an incident in December which resulted in a small number of equities derivatives positions being incorrectly recorded in ASX's Derivatives Clearing System.

- if it was reasonable to expect the new trading platform was ready for succesful production implementation and ongoing availability
- whether the project had sufficent resources
- the efficacy of the change control process
- the robustness and rigour of risk and issue management
- whether it was reasonable to expect the project test plan to be effective, commensurate with the risk appetite and criticality of the ASX Trade system
- the implications of the project on stakeholders
- whether ASX took into consideration the lessons learnt from managing a previous trading system incident in 2016
- whether the project met industry standards, frameworks or practices.

Overall, IBM found that ASX met or exceeded leading industry practices in around three-quarters of the capabilities that IBM assessed. ASX was found to have provided the project with sufficient staff, finance, time and technological resources, and communicated appropriately with key stakeholders. IBM also found that ASX's actions in managing the outage on 16 November were appropriate and reflected the lessons learnt from the 2016 incident.

However, IBM identified a number of key shortcomings in the ASX Trade Refresh project, including that:

- there were gaps in the rigour applied to the way that risks and issues were identified and managed and the project would have benefitted from more input from independent parties
- it was not reasonable to expect that the test plan used by ASX would meet its stated near-zero appetite for service disruption for a systemically important national infrastructure as stated in the ASX test policy
- IBM raised concerns about the composition of the primary governance function and that this governance function was also responsible for several other projects, diluting its attention on the ASX Trade Refresh project
- a number of factors suggested the platform was not ready for go live considering ASX's near-zero appetite for service disruption, including that ASX had identified the need for additional testing.

IBM made recommendations in seven key categories: risk, governance, delivery, requirements, vendor management, testing and incident management.

ASIC and the Bank published a summary of the findings from the IBM review in August.[20] ASX has agreed to address the recommendations from the review and has provided ASIC and the Bank with its high-level response. ASIC and the Bank expect ASX to apply the insights from IBM's findings across the ASX Group to ensure existing and proposed projects, including the CHESS replacement program, are managed and implemented appropriately.

20 For ASIC's media release see: https://asic.gov.au/about-asic/news-centre/find-a-media-release/2021-releases/21-220mr-update-on-the-independent-expert-review-of-november-s-asx-trade-outage/. For the Bank's media release see: Update on the Independent Expert Review of November's ASX Trade Outage, 23 August 2021. ASX also issued a media release that includes a summary of IBM's recommendations: https://www2.asx.com.au/content/dam/asx/about/media-releases/2021/independent-review-of-asx-trade-outage-november-2020.pdf.

3.3 Impact on settlement from CHESS batch delays

ASX was unable to identify the root cause of the 17 November CHESS settlement batch incident and has not been able to replicate the unscheduled database process that led to the delay. However, ASX has developed a procedure that will allow it to terminate the database process if it were to reoccur, allowing ASX to resolve the issue more quickly. This mitigates the risk posed by the specific events that led to the delay in the CHESS settlement batch on 17 November.

Nonetheless, the incident highlighted circumstances in which an operational incident may disrupt the DvP settlement process that is used to mitigate the risk that securities are delivered without payment being received, or vice versa. The DvP process used in CHESS is designed so that securities are transferred within CHESS if and only if the corresponding cash payments are made in RITS. In order to achieve this, the securities are locked in CHESS until confirmation is received that the cash leg has settled in RITS, at which point the securities are released to the accounts of the purchasing participants. This process typically takes around 15 minutes, but it was during this time that the settlement process froze on 17 November, meaning that the payment leg completed but the movement of securities did not.

If ASX had not been able to resolve the issue on the day, its options would have been to: 1) defer settlement of securities to the following day; or 2) seek to reverse the payments that had already settled and then reschedule settlement of both legs to the following day. However, it is unlikely that the latter option would have been feasible as it relies on the voluntary cooperation of payment providers that settle CHESS-related payments in RITS on behalf of participants.

Under the first option, ASX would utilise emergency powers in the ASX Settlement Operating Rules (ASXSORs) to delay the movement of securities into the accounts of purchasing participants to a subsequent day. During this period, the securities would remain locked in order to guarantee that they are available for settlement. The Bank and ASIC are engaging with ASX to determine whether there are any issues affecting the legal certainty of the DvP process in the event of an operational disruption.

ASX has reflected on lessons learned from its management of the incident and engaged with CHESS users to better understand the effects of service disruptions and to improve communications if they occur. It has provided greater clarity to participants and payment providers on the operational and communication processes for CHESS batch settlement, including actions it may take in the event of a contingency affecting the CHESS batch.

3.4 Conclusions and recommendations

While the CS facilities were not responsible for the incidents affecting ASX trading systems, ASX applies a group-wide approach to operational risk and project management, so there is a risk that the shortcomings identified by IBM in the ASX Trade Refresh project could affect the CS facilities if not addressed. Accordingly, the Bank will work closely with ASIC and ASX to ensure that any relevant findings or recommendations from the IBM review are applied to its clearing and settlement operations, and in particular to the CHESS replacement program.

The Bank and ASIC consider it important for ASX to complete analysis to confirm the legal certainty of arrangements to ensure that settlement of securities in CHESS takes place if and only if the corresponding cash movement has taken place in RITS.

Recommendations: ASX should address findings from the IBM review of the ASX Trade Refresh project, ensuring that any relevant steps are taken to apply lessons learned to its clearing and settlement operations, and in particular to the CHESS replacement program. ASX's assessment of how relevant lessons apply to the CHESS replacement program should be subject to independent external review.

ASX Settlement should complete analysis of the legal certainty of powers used to support deferral of the movement of securities if this cannot be achieved on the same day as transfer of cash.

4. Special Topics – Governance and Risk Management Framework

4.1 Governance

4.1.1 Introduction

Governance is essential to an entity’s compliance and resilience. Failures in risk management or compliance generally involve a weakness of governance. Such failures indicate that some aspect of the responsibility for operating an entity has not been assigned or fulfilled. The importance of governance is reflected in the FSS, where CCP Standard 2/SSF Standard 2 is devoted to governance.

Governance establishes the processes through which an entity sets its objectives, determines the means for achieving those objectives, assigns responsibility and accountability for implementing objectives and monitors performance. Governance forms the framework which determines the respective rights and responsibilities of an entity’s owner, board of directors, management and relevant stakeholders. In the case of a CS facility, relevant stakeholders include participants and their customers, regulators, interdependent FMIs and the broader market.

The ASX Group operates on a day-to-day basis as a single group rather than as a collection of individual entities. The ASX CS facilities have no employees, premises or IT resources. These are provided by ASX Operations, a wholly owned subsidiary of ASX Limited, in accordance with an agreement known as the Group Support Agreement, which has been entered into by the various ASX group entities. The Group Support Agreement requires that each of the CS facilities is provided with ‘adequate personnel and non-financial facilities’ to perform its services and legal obligations.

There are clear benefits to both the ASX Group and the CS facilities arising from this group-wide approach to governance and operations. The ASX Group avoids the need to replicate central functions such as people management, finance and risk management. The group and the CS facilities also benefit from flexibility in resourcing. In times of need, an ASX CS facility can potentially draw on greater resources, including financial and human resources, than may be available to an individual facility operating independently.

Risks may nevertheless arise when CS facilities form part of a group structure and these risks have ramifications for financial stability. Chief among these is the risk that the business, operations and obligations of the CS facilities do not receive sufficient attention in decisions about the day-to-day operation of the broader group. Another concern is that conflicts of interest arising between specific entities with the group (including the CS facilities) are not appropriately identified and managed.

Accordingly, an important issue for ASX is the appropriate balance between the benefits and risks of a group-wide operational structure. This issue is a central theme of this Assessment of the governance of the ASX CS facilities.

4.1.2 Scope and approach

FSS requirements

The key FSS requirements on governance are set out in CCP Standard 2 and SSF Standard 2. These requirements cover 8 main areas which are summarised below.

Table 5: Summary of FSS Requirements Relating to Governance

Areas	Standards	Key Requirements
Strategy and objectives	CCP Standard 2.1 SSF Standard 2.1	A CS facility should have objectives that: • place a high priority on the safety of the facility and • explicitly support the stability of the financial system and other relevant public interest considerations.
Roles, responsibilities and accountabilities	CCP Standards 2.3, 2.5 SSF Standards 2.3, 2.5	The roles and responsibilities of a facility's board of directors (or equivalent) should be clearly specified. The roles and responsibilities of management should be clearly specified. A facility's management should have the appropriate experience, mix of skills and integrity necessary to effectively discharge its responsibilities for the operation and risk management of the facility. Compensation arrangements should be structured in such a way as to promote the soundness and effectiveness of risk management.
Governance documentation	CCP Standards 2.2, 2.3, 2.6 SSF Standards 2.2, 2.3, 2.6	A CS facility should have: • documented governance arrangements that provide clear and direct lines of responsibility and accountability • documented procedures for the functioning of its board of directors, including procedures to identify, address and manage member conflicts of interest • a clear, documented risk management framework that includes the facility's risk tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision-making in crises and emergencies.
Corporate group structure	CCP Standard 2.9 SSF Standard 2.9	A CS facility that is part of a group of companies should ensure that measures are in place such that decisions taken in accordance with its obligations as a CS facility cannot be compromised by the group structure or by board members also being members of the board of other entities in the same group. In particular, such a CS facility should consider specific procedures for preventing and managing conflicts of interest, including with respect to intragroup outsourcing arrangements.
Risk management	CCP Standards 2.5, 2.6 SSF Standard 2.5, 2.6	Governance arrangements should ensure that risk management and internal control functions have sufficient authority, independence, resources and access to the board, including through the maintenance of a separate and independent internal audit function.
Audit and assurance	CCP Standard 2.7 SSF Standard 2.7	A CS facility's operations, risk management processes, internal control mechanisms and accounts should be subject to internal audit and, where appropriate, periodic external independent expert review. Internal audits should be performed, at a minimum, on an annual basis. The outcome of internal audits and external reviews should be notified to the Reserve Bank and other relevant authorities.
Board policies and processes	CCP Standard 2.3, 2,4 SSF Standard 2.3, 2.4	The board should regularly review both its overall performance and the performance of its individual board members. The board should comprise suitable members with the appropriate skills and incentives to fulfil its multiple roles.
Stakeholder engagement	CCP Standard 2.8 SSF Standard 2.8	Governance arrangements should ensure that the facility's design, rules, overall strategy and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders.

	Governance arrangements should provide for consultation and stakeholder engagement through appropriate forums on operational arrangements, risk controls and default management rules and procedures. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public

Methodology and benchmarking

The review of the governance of the CS facilities involved a document review and interviews of ASX Group directors and executives. The interviews were conducted with the assistance of an external adviser engaged by the Bank.

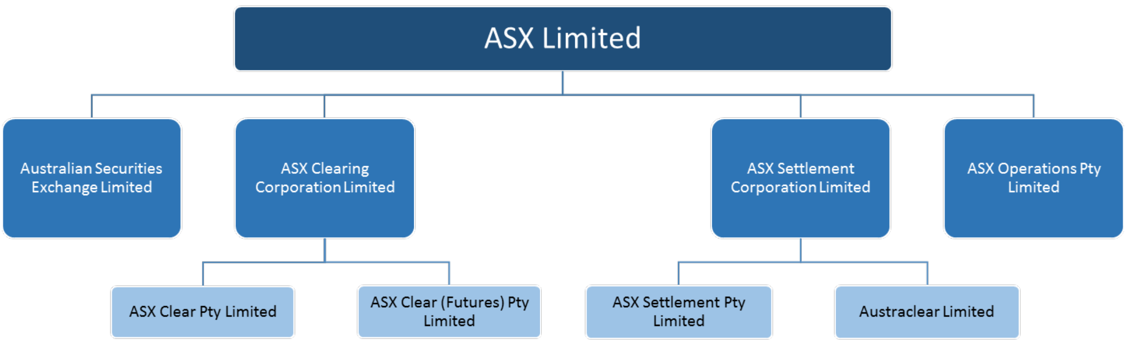
The governance of the CS facilities was assessed against CCP Standard 2/SSF Standard 2. The Bank also consulted other relevant governance benchmarks and recent reports on the governance of financial institutions and listed entities. These include:

- APRA: 'Prudential inquiry into the Commonwealth Bank of Australia' April 2018
- APRA Prudential Standard HPG 510: 'Governance' July 2019
- ASIC Corporate Governance Taskforce: 'Director and officer oversight of non-financial risk report', October 2019
- ASX Corporate Governance Council: 'Corporate governance principles and recommendations' 4th edition, February 2019.

4.1.3 Governance of the ASX group

The four ASX CS facilities form part of the ASX group of companies. They are controlled by ASX Limited through two holding companies as set out in Figure 1.

Figure 1: ASX Group Structure as Relevant to the CS facilities



As corporate entities, the CS facilities are required to have their own boards. Many directors of the CS facilities' boards (CS Boards) are also directors of the parent company ASX Limited. There are three directors who sit on the CS Boards but not on the ASX Limited Board (referred to in this Assessment as the non-ASX Limited directors).

There are currently three ASX Limited Board committees: the Audit and Risk Committee (ARC), the Remuneration Committee and the Nomination Committee. These committees also undertake activities on behalf of the CS facilities, although the CS Boards are responsible (among other things) for the operational risk of the CS facilities.

The ASX Limited and CS Boards meet 10 times a year. The ARC meets quarterly. All directors of ASX Limited routinely attend the ARC regardless of whether they are members. The non-ASX Limited directors do not attend the ARC but receive a subset of ARC papers including anything directly or indirectly relevant to the CS Facilities. They also receive a paper on relevant items, which is presented to the meeting by the ARC Chair.

On the board meeting day, the ASX Limited Board meets in the morning. The non-ASX Limited directors do not attend this meeting. The 'concurrent board meeting' is held in the afternoon of the board meeting day. This is a concurrent meeting of the boards of ASX Limited, each of the four CS Facilities and the two intermediate holding companies (referred to collectively as the 'ASX Boards'). It is chaired in rotation by the Chair of ASX Clear and ASX Settlement, and the Chair of ASX Clear (Futures). Prior to the board meeting day, these Chairs meet with relevant executives and the Company Secretariat to shape the agenda and issues for the meeting.

Membership of the Board and Board Committees as at 30 June 2021 is set out in Table 6 below:[21]

Table 6: Membership of Boards and Committees[22]

Director	Appointed to board/s	ASX Clear/ Settlement	ASX Clear (Futures)	Austraclear	ASX Limited	ARC	Remuneration	Nomination
Yasmin Allen	2015		✓	✓	✓	✓		
Melinda Conrad	2016				✓		✓	✓
Carolyn Colley	2020	✓	✓	✓				
Dr Ken Henry	2013	✓			✓	✓		✓
Stephen Knight	2019[23]	Chair	✓	✓				
Peter Marriot	2009	✓	✓	✓	✓	Chair		
Peter Nash	2019				✓	✓		
Heather Ridout	2012				✓		Chair	✓
Damian Roche	2014		✓	Chair	Chair	✓	✓	Chair
Dominic Stevens (CEO)	2013[24]	✓	✓	✓	✓			
Adrian Todd	2019	✓	✓	✓				
Rob Woods	2015[25]		Chair	✓	✓	✓		

21 Peter Marriot stepped down as Chair of the ARC on 18 August 2021 and has been replaced by Peter Nash. Mr Marriot remains a member of the ARC.

22 Former ASX Limited Chair Rick Holliday-Smith retired effective 21 April 2021. Austraclear Chair Peter Warne also retired in April 2021.

23 Appointed Chair 2020

24 Appointed CEO in 2016

25 Appointed to ASX Limited in 2020

4.1.4 CS Facilities' strategy and objectives

CCP Standard 2.1/SSF Standard 2.1

Corporate strategy and the setting of corporate objectives are among the functions conducted on a group-wide basis at ASX. There is a group-wide vision: 'to be the world's most respected marketplace'. ASX's strategy and the yearly goals to execute the strategy are also determined on a group-wide basis. The yearly goals are subject to monitoring and form the basis of the assessment of ASX staff performance and of ASX Group performance. This is reported in the Remuneration Report included in ASX's Annual Report. The yearly goals are therefore the subject of practical accountability within ASX.

The yearly goals include goals that are of central relevance to the CS Facilities. However, they do not include specific reference to the safety of the CS Facilities. Nor do they explicitly support the stability of the financial system.

The first paragraph of the CCP Standard 2/SSF Standard 2 on Governance requires CS Facilities to have objectives which place a high priority on the safety of the CS facility and '*explicitly support the stability of the financial system and other relevant public interest considerations'.* This reflects the importance of ensuring that safety, financial stability and the public interest are firmly embedded in the organisational culture and decision making of a CS facility. Where a CS facility forms part of a corporate group, goals and objectives that emphasise safety, financial stability and the public interest have an additional function. They assist in ensuring that the business, obligations and systemic importance of the CS facilities are given due attention in the course of group-wide decision making. This is a significant aspect of ensuring that an appropriate balance is struck between the risks and benefits of operating CS facilities within a corporate group.

ASX recently amended its Clearing and Settlement Boards Charter to include the references to safety and financial stability which are required under CCP Standard 2.1/SSF Standard 2.1. The CS Boards Charter is an important part of the ASX governance framework. However, it does not have the same level of prominence and influence on organisational culture as the ASX Vision, strategy and yearly goals. Adherence to the CS Boards Charter, for instance, is not a basis for performance assessment or annual reporting. The Charter is not the subject of practical accountability. It does not articulate broader objectives for the CS facilities.

Safety, financial stability and the public interest should form part of a statement of the strategy and objectives of the CS facilities. Objectives, strategies and goals for the CS facilities can sit alongside or complement the current, group-wide framework.

In order for obligations of financial stability to have a practical effect on operations and decision making, the obligations must be well understood within the organisation. ASX should ensure that it formulates a clear articulation of financial stability and the way in which the ASX CS facilities operate to safeguard it. For example, the Bank has described a 'stable' financial system as one in which financial intermediaries, markets and market infrastructure facilitate the smooth flow of funds between savers and investors. This helps promote growth in economic activity. From this perspective, the safeguarding of financial stability can be seen to be a forward-looking task. A resilient financial system is also one in which there are well developed crisis management arrangements for handling distressed financial institutions. This should be managed in a way that ensures that public confidence in the financial system will not be undermined.[26]

[26] About Financial Stability | RBA

Governance Recommendation 1: The objectives, strategies and goals for each CS facility should be documented and communicated within the ASX group. The objectives should explicitly place a high priority on the safety of the facility and explicitly support the stability of the financial system and other relevant public interest considerations. This should include a statement on how 'financial stability' can be practically understood by decision makers within the CS facilities. It should also set out the strategies that have been adopted to safeguard system stability. CS Board processes should include a system for monitoring progress against the strategy and objectives.

4.1.5 Roles, responsibilities and accountabilities

CCP Standards 2.2, 2.3 2.5, 2.6 and 2.7/SSF Standards 2.2, 2.3, 2.5, 2.6 and 2.7

Clear roles and responsibilities with accompanying accountability are essential to good governance. A critical aspect of this is a clear understanding of the differing roles of the board and executive of an entity. Although these roles should be clear, they may not always be static. For instance, it is appropriate for a board to intensify its oversight at times of high risk.

The evidence that the Bank has considered demonstrates that the ASX has appropriate demarcation between the roles of the ASX Boards and the executive. The Bank was told that the ASX Boards have intensified their supervision in recent times. The Bank understands that this occurred following the re-setting of the go-live date for the CHESS replacement program and the operational issues which occurred in 2020. It is appropriate that such events would trigger a temporary increase in the intensity of board supervision.

In the context of a group structure such as that of ASX, it is important that the roles and responsibilities of the boards within the group are clear. Where a CS facility is part of a corporate group, some roles and responsibilities of the board may be carried out on a group-wide basis. For instance, some roles and responsibilities may be carried out by the board of the CS facility's parent company. This enables the corporate group to achieve reasonable efficiencies. However, the CS facility must be able to demonstrate that any such alternative governance arrangements are effective. The arrangements must uphold the CS facility's capacity to meet its regulatory and other obligations. Furthermore, the arrangements must not compromise or subordinate the CS facility's interests to the interests of the group.

The ASX Limited Board Charter, the CS Boards Charter and the charters for the various board committees within the ASX group provide some information and guidance on the respective roles of the various boards and board committees. However, the CS facilities would benefit from greater clarity on the functions which the ASX Limited Board undertakes on behalf of the CS facilities. This would enhance the effectiveness of these arrangements.

The internal corporate structure of the ASX group is also group-wide. The operating model of the ASX corporate structure is currently undergoing change. The changes are intended to organise ASX's business into four clearly defined business lines. In each of these business lines, a single executive reporting to the CEO is responsible for the end to end business and system development. One of the goals of the new operating model is to facilitate accountability and delivery.

The changes are being implemented in multiple phases. The Bank understands that the implementation of these changes is expected to be complete by October 2021.

CCP Standard 2.2/SSF Standard 2.2 requires that an FMI should have 'documented governance arrangements that provide clear and direct lines of responsibility and accountability'. The ASX CS facilities did not have such documented arrangements in place as at the assessment date of 30 June 2021. However, the Bank acknowledges the challenges in having up-to-date documented governance arrangements in place on a continuous basis during the reorganisation of a complex entity.

More significantly, the ASX CS facilities did not have such documented governance arrangements in place before ASX commenced its move to the new operating model.

Furthermore, to the extent that ASX's previous governance arrangements were documented, it is not clear that the documented arrangements were reflected in ASX group practice. For instance, paragraph 10 of the CS Boards Charter delegates the management of the CS facilities to the Managing Director and CEO of ASX Limited. However, in interviews, directors and executives did not provide consistent answers on whom they considered to be responsible to the CS Boards for the operation of the CS facilities under the previous organisational structure; they did not appear to consider that this responsibility lay with the Managing Director and CEO.

Good governance practice also requires that responsibility is aligned to appropriate accountability. Paragraph 6 of the CS Boards Charter provides that the CS Facility Boards will provide input to the ASX Remuneration Committee on the performance and remuneration arrangements of the Chief Risk Officer and Chief Operations Officer. It also provides that the CS Facility Boards may, in their discretion, provide inputs to the Remuneration Committee on the remuneration arrangements and performance of other ASX executives regarding matters relevant to the CS facilities. The CS Boards have not historically had input into the performance or remuneration of the Managing Director and CEO of ASX Limited but this was changed in June 2021. This recent change brings the accountability framework into greater alignment with the documented framework for responsibility.

Ultimately, the lines of responsibility for operating the CS businesses must be clearly documented. The documented lines of responsibility, the practical reality and the accountability framework should be consistent and clearly understood. This is a fundamental requirement of the FSS and is consistent with domestic and international trends towards a stronger emphasis on executive accountability.

The CS Boards are made up of non-executive directors, many of whom are also directors of ASX Limited. In such circumstances, it is important that there are clear and well understood lines of responsibility for the operation of the CS facilities. Effective oversight by the CS Boards would be facilitated if the CS facilities were each led by a single executive rather than two or more executives separately reporting to the CS Boards for any CS facility. The Managing Director and CEO is ultimately responsible for leading the parent company and the broader ASX Group. He or she has many responsibilities in addition to the day-to-day operations of each of the CS facilities. He or she may also be affected by intragroup conflicts of interest (discussed further below). Clearer and more direct lines of accountability will be facilitated if a single executive, referred to in this Assessment as the 'CS Lead Executive' was responsible to the board of a CS facility for the operation of that facility. This executive could also be a 'voice' for the interests, business and obligation of the CS facility within the broader group.

In order to ensure an undiluted and non-conflicted focus on the interests of the CS facilities, a CS Lead Executive should not also be the CEO and Managing Director of ASX Limited. The CS Lead Executive should have a clear line of accountability to the relevant CS Board. He or she may also report to the CEO and Managing Director of ASX Limited. The CEO and Managing Director of ASX Limited should be accountable for ensuring that the CS Lead Executive has access to sufficient resources for the operation of the CS business.

A CS Lead Executive may hold that role for more than one of the CS facilities and may also have responsibilities for other parts of the ASX Group. However, if this is to occur, careful consideration should be given to any conflicts of interest that might arise and these conflicts should be appropriately managed. These include potential conflicts that may arise between the CS facilities, and between one or more CS facility and the interests of the wider group. Consideration must also be given to ensuring that appropriate attention can be devoted to the business and obligations of each CS facility including in a time of market stress or crisis.

Internal audit is a group-wide function at ASX. ASX's internal auditor has a team of six full time staff. Some internal audits are conducted by the internal audit team while others are outsourced to external providers. This is a reasonable approach as some ASX audits relate to technology projects such as CHESS Replacement. Audits of this nature require a range of specialist technical expertise.

Evidence gathered during the Bank's review indicated that there was some resistance within ASX to internal audit exercises. The ASX Group Boards and executive should ensure this does not continue. The FSS on Governance emphasises the importance of a strong audit function. CCP Standard 2.7/SSF Standard 2.7 state that a CS Facility's '*operations, risk management processes, internal control mechanisms and accounts should be subject to internal audit and, where appropriate, periodic external independent expert review*.'

Paragraph 6.1 of ASX's Internal Audit Charter states: '*The General Manager, Internal Audit who is the Chief Audit Executive reports to the Chairman of the Audit & Risk Committee and for administrative purposes to the Chief Risk Officer (CRO). The General Manager, Internal Audit also has direct access to the Clearing & Settlement boards.'* It is appropriate that the General Manager, Internal Audit should report to the Chair of the ARC and have direct access to the CS Boards. While the Bank notes that the General Manager, Internal Audit reports to the Chief Risk Officer for administrative purposes only, this is not best practice as the internal audit function has responsibility for evaluating risk management and the risk management framework. The respective roles of risk management and internal audit are discussed in more detail in section 4.2.2 below. The administrative reporting line for the General Manager, Internal Audit should instead be to the Managing Director and CEO of ASX Limited.

Governance Recommendation 2: ASX should introduce clearer lines of responsibility and accountability for each CS facility as required by CCP Standard 2.2/SSF Standard 2.2. An appropriate way to do this would be to appoint one or more identifiable executives, the 'CS Lead Executive/s', accountable to the relevant CS Board for the operation of each of the CS facilities. The CS Lead Executive/s should also be accountable for the achievement of strategies and objectives determined by the relevant CS Board. The relevant CS Board should have input into both the performance assessment and remuneration of the CS Lead Executive/s.

Governance Recommendation 3: As soon as practicable in the circumstances of the current transition to ASX's new operating model, ASX should document governance arrangements that set out clear and direct lines of responsibility and accountability for each of the CS facilities' businesses as required by CPP Standard 2.2/SSF Standard 2.2. This can be done by way of an accountability map that contains the names of staff with senior executive responsibility for all or part of each CS facility's operations. The accountability map could contain details of the reporting lines and lines of responsibility for those senior executives. Such a map would demonstrate the lines of reporting from those senior executives through to a board or board committee within the ASX Group and specify the relevant board or board committee. Senior executives who could usefully be included on such an accountability map would include those with the following responsibilities:

(a) CEO and Managing director of the ASX Group

(b) the CS Lead Executive for each CS facility

(c) management of the CS Facility's financial resources

(d) overall risk control and overall risk management of the CS Facility

(e) management of the CS Facility's operations (i.e. Chief Operating Officer or equivalent)

(f) information management, including information technology systems for the CS Facility

(g) management of the CS Facility's internal audit function

(h) management of the CS Facility's compliance functions

(i) provision of legal advice to the board of the CS Facility

(j) management of the CS Facility's human resources functions.

Governance Recommendation 4: In accordance with CCP Standard 2.5/SSF Standard 2.5, ASX should clearly specify the roles and responsibilities of directors and of the senior executives referred to in Governance Recommendation 3. This can be done by creating, for each such person, an accountability statement containing details of:

(a) the part of the CS facility's business for which that person has senior executive responsibility

(b) the responsibilities of that person.

The accountability statement for the CEO and Managing Director should document his or her responsibility for ensuring that the CS Lead Executive has access to sufficient resources for the operation of the CS facility.

Governance Recommendation 5: ASX's performance and remuneration policies and frameworks should ensure that any failure by a person identified in Governance Recommendation 3 to appropriately discharge their responsibilities will be reflected in any variable remuneration payable to that person. This will promote the soundness and effectiveness of risk management of the CS facilities as required by CCP standard 2.5/SSF standard 2.5.

Governance Recommendation 6: The administrative reporting line for the General Manager, Internal Audit should be to the Managing Director and CEO of the ASX Group.

4.1.6 Oversight by the ASX Group Boards

CCP Standard 2.3, 2.4 and 2.9/SSF Standard 2.3, 2.4 and 2.9

In addition to operational concerns, the high profile technology and operational issues experienced by ASX during 2020 raise general issues of governance and specific issues about the boards' supervision of technology projects.

Many ASX directors and executives to whom the Bank spoke had clearly reflected carefully on these events and the lessons to be learned from them, including governance lessons. This is appropriate. It is clear from our interviews with directors that there were periods during 2019 and/or 2020 when the ASX Boards were not fully informed of the progress and status of the CHESS replacement program. It is important that the ASX Boards carefully consider any changes to their policies, processes and approach that may be required to avoid a similar scenario in future.

A culture of robust and respectful challenge is essential to effective board supervision. Directors must be prepared to provide this challenge and executives must respond constructively and with transparency. Interviewees told the Bank that such a culture has always existed on ASX Boards but that the level of challenge has increased following recent events. The Bank encourages the new ASX Limited Chair's efforts to prioritise a culture of robust and respectful challenge. This includes the recent introduction of private meetings of directors (without executives) as part of every meeting of the ASX Boards.

The Bank also supports efforts by the ASX Company Secretariat to standardise the form of reporting to the ASX Boards. Director feedback suggests that reports to the boards are sometimes too lengthy and contain excessive technical detail. Similar comments on ASX's reporting style have been made by external contractors engaged to provide assurance on governance of key ASX projects. The Bank has also observed this tendency in reports and updates it receives from ASX. Excessive technical detail makes it difficult to engage on the key issues in reports.

Role and stature of the CS Boards

Governance arrangements which may serve to diminish the role and stature of the CS Boards should be addressed. While the CS facilities are wholly owned subsidiaries, they are also CS facility licensees independently charged with specific public interest responsibilities for financial stability. Hence it is both inaccurate and inappropriate for the ASX ERMF and other governance documentation to state that the ASX Limited Board and the ARC '*rely on the CS boards to review and provide oversight of risk management processes, internal controls and compliance systems relating to CS processes.'* Responsibility for the oversight of risk management relating to CS processes rests with the CS Boards in the first instance. It is the legal responsibility of the CS Boards. It is inappropriate for governance documentation to state that the ASX Limited Board and an ASX Limited Board committee 'rely' on the CS Boards to discharge a responsibility which is the legal obligation of the CS Boards. Such a statement could imply that the CS Boards might not discharge their responsibility in the absence of such 'reliance'.

ASX should also take steps to ensure that appointments to the CS Boards are not, and are not seen to be, an opportunity to assess candidates for appointment to the ASX Limited Board. Statements made during interviews of directors suggested that this may be their perception. This may carry the risk that the actions of the CS directors are influenced, or seen to be influenced, by their prospects of eventual appointment to the Board of ASX Limited. This does not preclude a non-ASX Limited director from being appointed to the ASX Limited Board if they possess appropriate skills and experience.

A corporate board should comprise members with a range of relevant and complementary skills including skills and experience in the core business of the entity. Therefore the mix of skills and experience required by the CS Boards may differ from the ASX Limited Board. ASX should conduct a skills audit of the boards of each of the CS facilities, similar to the audit conducted and published every year for the ASX Limited Board. Such a process is a useful reminder and checklist of the skills required on the board of an FMI. It will also assist in emphasising the distinct role and nature of the CS Boards.

The CS Boards should also formally approve the application of any group-wide policies, procedures or governance documentation that affect the CS facilities. The CS Boards should note the manner in which the relevant policy, procedure or document applies to the CS facilities.

Governance Recommendation 7: ASX should conduct an annual skills audit of each CS Board in the same manner as the audit currently conducted for the ASX Limited Board.

Governance Recommendation 8: The CS Boards should formally approve the application of any group-wide policies, procedures or governance documentation to the CS facilities. Such policies should include a statement, approved by the CS Boards, as to the manner in which the relevant policy, procedure or document applies to the CS facilities.

The role of non-ASX Limited directors

A group of three directors sits on the boards of all four of the ASX CS facilities but not on the ASX Limited Board. These three directors represent half of the boards of ASX Clear and ASX Settlement and a meeting of these three directors will constitute a quorum of the boards of those entities. The balance of those boards is made up of directors who also sit on the ASX Limited Board. The three non-ASX Limited directors also sit on the boards of ASX Clear (Futures) and Austraclear. These boards have eight members. In both cases the other five members are members of the ASX Limited Board.

One role of the non ASX CS directors is to ensure that there are adequate arrangements for the handling of conflicts of interest that arise in the ASX Clear and ASX Settlement businesses. This conflict arises because ASX Clear and ASX Settlement provide clearing and settlement services to market operators who are competitors of ASX Limited. In its interviews with ASX directors and executives, the Bank observed that this conflict of interest was regularly acknowledged and well understood. Some CS directors nominated it as the sole reason for appointing non-ASX Limited directors. However, the appointment of non-ASX Limited directors pre-dates the introduction of competition in equity markets and the specific conflict of interest that has resulted from that.

Specific governance arrangements exist to manage this commercial conflict of interest affecting ASX Clear and ASX Settlement. Some aspects of these arrangements are reflected in the ASX Cash Equities Clearing and Settlement Code of Practice. The CS Boards Charter provides that at least half of the directors of ASX Clear and ASX Settlement must not be ASX Limited directors. This group of non-ASX Limited directors also forms a quorum of the boards of those entities. The Charter provides for meetings of the non-ASX Limited directors for the purpose of specified matters related to this conflict of interest. The Charter provides that the Chairs of ASX Clear and ASX Settlement may not be ASX Limited directors.

In the Bank's view, the management of this commercial conflict of interest affecting ASX Clear and ASX Settlement is not the only role of the non-ASX Limited directors. As discussed above, the Bank is recommending that a CS Lead Executive is appointed for each CS facility to be the 'voice' of the CS facility at the executive level within the ASX Group. Similarly, the non-ASX Limited directors play a critical role in providing that 'voice' at the level of the ASX Group Boards. This is another important factor in minimising the risks to the CS facilities from membership of a corporate group, while continuing to retain the benefits. It assists in ensuring that the businesses and obligations of the CS facilities receive sufficient attention within ASX. It is also critical to the management of intra-group conflicts of interest (discussed further below). The role of the non-ASX Limited directors is therefore vital to the governance of the CS facilities. This would be particularly the case for a CS facility if the CS Lead Executive performs other roles and functions within the ASX Group. In those circumstances, the non-ASX Limited directors are the only ASX officers with an undiluted duty to the business and obligations of the CS facilities.

The non-ASX Limited directors are the 'voice' of ASX Clear (Futures) and Austraclear as much as they are the voice of ASX Clear and ASX Settlement. Accordingly, the provisions in the CS Boards Charter about board membership, quora and the independence of the chair should also apply to the other CS facilities. This should occur notwithstanding that the ASX Cash Equities Clearing and Settlement Code of Practice does not apply to ASX Clear (Futures) and Austraclear. The ASX Cash Equities Clearing and Settlement Code of Practice was introduced to address the specific commercial conflicts of interest arising from competition in equity markets. This conflict is an example of the broader conflicts of interest that may arise in a corporate structure such as the ASX Group.

Care must be taken to ensure the non-ASX Limited directors are always kept fully informed of, and involved in, matters affecting the CS facilities. Considerable thought has clearly been given to this issue by the ASX Boards and Company Secretariat. The non-ASX Limited directors confirmed that they were generally satisfied with the information they received and their inclusion in discussions relevant to the CS facilities.

However, the Bank identified instances in which the non-ASX Limited directors have not been sufficiently included. The non-ASX Limited directors are generally not invited to meetings of the ARC, including meetings which discuss risks relevant to the CS facilities. Instead, they receive edited versions of relevant ARC papers and a board paper that reports on relevant ARC matters presented by the ARC Chair. This is inappropriate, particularly since the ARC is generally nominated as the principal board-level body overseeing the risks of the CHESS Replacement program.

A primary mechanism for ASX Internal Audit to report to the ASX Group Boards is through the ARC meetings, which are not attended by the non-ASX Ltd directors. As noted above, the concurrent board meeting receives an edited version of each internal audit report presented to the ARC. This report is sometimes presented to the concurrent board meeting by the CRO on behalf of the General Manager, Internal Audit. This practice prevents the non-ASX Ltd directors from engaging directly with the General Manager, Internal Audit on audit matters affecting the CS facilities. It is inappropriate for this report to be delivered by the CRO for the reasons set out in section 4.1.5 above. It is important that the full board of each CS facility has a direct relationship of active engagement with the senior executive responsible for managing the CS facilities' internal audit function. The senior executive responsible for managing the CS facilities' internal audit function should attend the concurrent board meetings to deliver the internal audit report.

Further, risk appetite has been determined at a group-wide level by the ASX Limited Board without the involvement of the non-ASX Limited directors. The non-ASX Limited directors are involved in the approval of related key risk indicators and CS operational risk tolerance, but not the overarching risk appetite. The non-ASX Limited directors should be involved in determining the risk appetite of the CS facilities.

Governance Recommendation 9: The application of the following arrangements for ASX Clear and ASX Settlement should be extended to ASX Clear (Futures) and Austraclear:

(a) the requirement that the boards shall comprise at least 50 per cent non-executive directors who are not also directors of ASX Limited and that the non-ASX Limited directors can also comprise a quorum

(b) the requirement that the Chair is not also an ASX Limited director

(c) provision for meetings of non-ASX Limited directors. These meetings should consider all potential conflicts of interest between the CS facilities and other ASX Group entities.

The composition and appointment of the Chairs of the boards of ASX Clear (Futures) and Austraclear should be changed accordingly.

Governance Recommendation 10: The non-ASX Limited directors should be represented in board-level discussions of the supervision of risks to the CS facilities. This includes involvement at any board or committee meeting which considers risks or the risk appetite of the CS facilities.

4.1.7 Supervision of technology projects

CCP Standards 2.2 and 2.6/SSF Standards 2.2 and 2.6

The ASX Trade Refresh project and CHESS Replacement program form part of an ambitious program by the ASX to update and upgrade its technology. Board oversight of such a program requires specific attributes including skills, experience, understanding and personal networks that are relevant to large technology project implementation.

The new Chair of ASX Limited is considering the establishment of a technology project implementation board committee. The committee may include members who are not ASX Group directors but have skills, experience, understanding and personal networks which can assist the ASX Boards in their supervision of technology projects. Such a committee would also assume some of the responsibilities currently undertaken by the ARC.

The Bank supports this initiative. Project implementation has proven to be a critical and ongoing risk for ASX. More intensive board oversight in this area is required. If such a committee is established, care must be taken to ensure that there is a clear and documented allocation of responsibilities between the ARC and the technology project implementation committee in the area of risks arising from technology projects. To the extent that the technology project implementation committee oversees projects relevant to the CS facilities (such as CHESS replacement), one or more of the non-ASX Limited directors should sit on the committee.

Skills and experience among members of the technology project implementation committee may also benefit the group in its management of cyber risk. Once again, the responsibility for supervising the management of this critical risk must be clearly allocated.

The establishment of such a committee does not of itself discharge the responsibility of all directors to develop and maintain their understanding of all aspects of the CS facilities’ risks and businesses.

Governance Recommendation 11: ASX should continue to explore ways to provide its boards with access to skills, experience and networks relevant to large technology project implementation.

Governance Recommendation 12: The ASX Group Boards should strengthen their oversight of technology project implementation. To achieve this, ASX should proceed with its proposal to establish a board committee to monitor technology project implementation. The respective responsibilities of this committee and the ARC will need to be carefully defined.

4.1.8 Board policies and processes

CCP Standards 2.2 and 2.3/ SSF Standards 2.2 and 2.3

The director nomination process at ASX is conducted on a group-wide basis with a single nomination committee operating for all ASX Boards. In successive annual ASX Board feedback surveys, board recruitment has been identified as an area requiring improvement. Comments noted that the process would benefit from more structure and greater transparency. In contrast, the process of nominating the new ASX Limited Chair was conducted by a small sub-committee and appears to have been more structured and effective.

The new ASX Limited Chair has also assumed the chair of the Nomination Committee and has indicated that he is planning a more structured and collaborative approach to director recruitment and succession planning for ASX Group Boards. This is encouraged. Ideally, the procedure for nominating directors to ASX Group Boards should be documented to allow for greater transparency and understanding among the directors.

Lengthy director tenures pose risks to an organisation including a potential erosion of director independence and the loss of opportunities for fresh and innovative thinking. The ASX Corporate Governance Council recognises these risks. The Council has released its 'Corporate Governance Principles and Recommendations', which include a recommendation that the length of service of each director be disclosed. They also advise boards to regularly assess whether any director who has served in that position for more than 10 years may have ceased to be independent.

The ASX Boards have included a number of very longstanding members, two of whom retired in 2020-2021. This has resulted in a substantial loss of corporate memory and experience, notwithstanding the considerable skills and experience of the rest of the ASX Boards. A more structured program of board renewal should be adopted to better manage the risk of significant loss of corporate memory and avoid the risks posed by lengthy director tenure. Both the ASX Limited Board Charter and the CS Boards Charter state that the boards have not adopted a tenure policy. This should be re-considered. The ASX Group should progressively adopt a structured process of board refreshment culminating in a formal tenure policy.

Board education was described as 'unstructured' during our interviews of directors and executives. As acknowledged above, the members of the ASX Boards are skilled and experienced but ASX operates in a dynamic industry. Some aspects of ASX's business, including the CS businesses, are also highly technical. A more systematic approach to training and education of directors should be introduced. Particular emphasis should be placed upon ensuring that directors, including the CS directors, are supported in their supervision of the ASX technology program which includes the CHESS replacement program.

Performance management of the ASX Boards and individual directors could be improved. ASX directors complete an annual board feedback survey and every three years, this survey is conducted by an external consultant. Feedback from the survey is considered but there does not appear to be a system for making or monitoring changes as a result of the survey. Individual directors meet with the Chair on an annual basis, but there is no formal survey of feedback for individual directors. ASX should consider changes to introduce more structure and rigour to performance management of the boards and directors.

The meeting arrangements of the ASX Boards are complicated, which is a reflection of the complexity of the ASX Group and its obligations. There is no documented guidance for determining which matters are considered at which meeting; for instance, whether a specific issue should be considered by the ASX Limited Board or at the concurrent board meeting. The absence of structured guidance may have contributed to situations where the CS Boards were not appropriately consulted on issues relevant to the CS facilities. An example of this was the consideration of the ASX Group risk appetite (including the risk appetite on CS issues) by the ASX Limited Board only. ASX governance documentation should include guidance on which matters should be referred to which meeting.

Governance Recommendation 13: ASX Group should adopt:

(a) structured and documented processes for director recruitment and board renewal, ultimately including a tenure policy

(b) a more systematic approach to board education with an emphasis on supporting directors in the supervision of ASX's technology program

(c) systems for considering and implementing feedback arising from the annual board feedback survey

(d) more rigorous director performance management

(e) documented guidance as to the matters that should be referred to the various board meetings.

4.1.9 Board committees

As at 30 June 2021, ASX Limited had three board committees: the ARC, the Nomination Committee and the Remuneration Committee. The committees also discharge responsibilities for the CS facilities as provided in the CS Boards Charter. Many financial institutions have separated the 'audit' and 'risk' aspects of board committees. There is no support for such a move within ASX and this does not appear to be warranted in the context of the risk and activity profile of the ASX Group.

Recommendations are made elsewhere in this Assessment for the establishment of a technology project implementation committee and, potentially a stakeholder management committee.

4.1.10 Intragroup conflicts of interest

CCP Standard 2.9/SSF Standard 2.9

The commercial conflict of interest arising from the business of ASX Clear and ASX Settlement is discussed above. As noted above, this conflict of interest appears well recognised and understood by the ASX Group.

Additional conflicts of interest may arise as a result of the ASX Group structure. In circumstances where financial, human and other resources are shared within a group, or can be easily transferred between group entities, choices must be made. For example, the ASX Group entities have entered into the Group Support Agreement concerning the provision of human, financial and other resources to the CS facilities. When the Group Support Agreement is amended, there is potential for the interests and obligations of the CS facilities and the interests of other ASX Group entities to diverge. The interests of each CS facility will be best served (and their obligations most completely fulfilled) by obtaining the highest possible level of resourcing with the maximum level of certainty. The interests of other ASX entities (specifically ASX Operations) will be to maximise the flexibility of resources within the group. The other ASX entities may also have an interest in minimising disruption to group arrangements and this may also conflict with the interests and obligations of the CS facilities. In these circumstances, conflicts of interest or obligations may also arise between the CS facilities if resources are being allocated to them from a finite pool.

Such intragroup conflicts of interest are recorded on ASX's conflict of interest register as part of the implementation of ASX's conflict of interest framework. However, as a practical matter, these conflicts of interest do not appear to be well understood within the ASX Group. In interviews with ASX directors and executives, these conflicts were recognised but considered to be ‘technical’ or ‘theoretic’. The reason for this was a strong belief that the CS facilities are ‘the core’ of the ASX Group and that the ASX Group would never leave them under-resourced. Such conflicts of interest should nonetheless be appropriately managed.

The Group Support Agreement was amended in 2020 to transfer business, operational and investment risk capital to the CS facilities. This occurred as a result of concerns regarding the certainty of access to this capital in a crisis that were expressed by the Bank in its 2019 Assessment of the ASX CS facilities. The manner in which the Bank’s concerns should be addressed was the subject of lengthy discussion between ASX and its regulators. During the course of these discussions, ASX did not take sufficient responsibility for identifying and managing the intragroup conflict of interest. In correspondence between the Bank and ASX, it was the Bank that identified the potential conflict. The boards of the CS facilities did not obtain independent legal advice on this issue. They were advised by staff in ASX’s legal department. These staff are employed to provide legal services to the ASX Group and report to the General Counsel of the ASX Group. Accordingly, this would impede their ability to provide independent advice to the CS facilities in matters involving a potential intragroup conflict of interest.

Article 48 of ASX’s revised CS Board Charter provides:

> ‘*The CS Boards may, with their Chair’s prior consent, seek independent professional advice (at the CS Boards’ expense) that they consider necessary to fulfil their responsibilities.’*

The Bank was informed that the words ‘at the CS Boards’ expense’ were included to prevent a perception that any professional advice would be subject to a conflict of interest if it were funded by ASX Limited. The Bank was further informed that, as a matter of practice, any such advice would be funded by ASX Operations since the CS facilities have no funds of their own. Nonetheless, the inclusion of the words ‘at the CS Boards’ expense’ carries the risk of discouraging the CS directors from seeking genuinely independent advice. The fact that the CS entities have no funds of their own for the payment of operational expenses increases this risk. The description of the expense as one for the ‘CS Boards’ rather than the ‘CS entities’ might even be interpreted as requiring the directors to personally pay for any advice. The Bank acknowledges that this interpretation was not intended. The drafting of Article 48 should be revised.

ASX should ensure that the CS facilities, represented by the non-ASX Limited directors, have unqualified access to independent advice on legal questions and other relevant matters. To facilitate this, it may be of benefit to establish a small unit dedicated to supporting the CS Boards, including procuring external advice where appropriate. If such a unit were to be established, the leader of the unit should appear on each CS Facility’s accountability map (Governance Recommendation 3) and an accountability statement (Governance Recommendation 4) should be completed for that person.

Much of the regulation of the CS facilities exists because of their importance for financial stability. Central to this is the management of the CS facilities in times of market volatility, disruption and crisis. It is times like these that will test the operation of the facilities, including the management of conflicts of interest. It is not sufficient to assume that the ASX Group will never be in a position where it might have difficulty resourcing the CS facilities. Clear policies and procedures are required to mitigate this risk.

Governance Recommendation 14: ASX should take steps to improve their identification and management of intragroup conflicts of interest. The non-ASX Limited directors should have unqualified access to independent legal advice and other expert advice on matters where the interests or obligations of a CS facility could potentially conflict with the interests of another entity in the ASX Group. To facilitate this, ASX should consider establishing a small unit of staff dedicated to supporting the CS Boards, including by providing assistance with obtaining external advice.

4.1.11 Stakeholder management

CCP Standard 2.8/SSF Standard 2.8

During the course of the Bank's review, many interviewees noted that ASX has been historically very insular. Considerable effort has been expended in recent years on increasing the 'customer focus' of ASX. In the case of the CS facilities, this needs to be expanded to incorporate the broader concept of 'stakeholders' in the FSS. Stakeholder management was an ongoing issue for the CHESS replacement program in the lead-up to the re-set of this program in 2020. The ASX Boards should continue their emphasis on stakeholder management, including holding more regular meetings with key stakeholders. This might be achieved through the establishment of a stakeholder committee of the board.

A critical first step in managing stakeholders is the development of a clear understanding as to whom these stakeholders are. ASX has already given consideration to this and produced a useful diagram in its ERMF. This work should be built upon to create a public Stakeholder Management Charter which identifies groups of stakeholders and articulates the ASX's approach to engaging with each group of stakeholders. Such a document should be published, at least for the CS facilities, but may also be published on a group-wide basis. If prepared on a group-wide basis, the document should clearly distinguish the stakeholders of the CS facilities.

Governance Recommendation 15: The ASX Boards should continue their emphasis on stakeholder management, potentially through the creation of a stakeholder committee. This should also include more regular meetings with key stakeholders.

Governance Recommendation 16: The CS facilities should publish a Stakeholder Management Charter, which identifies groups of stakeholders and articulates the ASX's approach to engaging with each group of stakeholders.

4.1.12 Board responsibility for oversight of CS facility compliance

Some aspects of regulation of the CS facilities are 'principles-based'. In principles-based regulation, the regulations mandate a required 'state' but regulated entities are permitted to attain the required 'state' in a manner that is suited to their own businesses and circumstances. This provides the individual regulated entities with some flexibility. This benefit is accompanied by a responsibility on the part of the regulated entity to give proper consideration as to how the 'state' required in the regulations is to be achieved. As discussed during the interviews, in recent years there have been two instances of proposals that have been presented to the Bank which (in the Bank's view) were unlikely to effectively achieve a state of compliance. In both cases, the proposals were approved by ASX Boards before they were presented to the Bank.

When interviewees (directors and executives) were questioned about these matters, many appeared untroubled. Some directors commented that they did not see it is a significant issue because, as soon as they learned 'what the Bank wanted', they complied. This appears to misunderstand ASX's responsibility to come to its own understanding on compliance with regulatory obligations.

Furthermore, the executives who presented the initial proposals do not appear to have been questioned or challenged when it became apparent that their proposals would not achieve a state of compliance. In the Bank's view, the ASX Boards should take a more active role in ensuring that ASX fulfils its regulatory obligations and instilling a compliance culture within the ASX Group.

One way of regularly considering the state of ASX compliance would be for the CS Boards to require the CS Lead Executive to complete an annual self-assessment of compliance with the FSS. This will ensure ongoing attention to key aspects of the FSS including governance requirements relating to documentation and accountability.

Governance Recommendation 17: The CS Boards should require the CS Lead Executive(s) to complete an annual self-assessment of compliance with the FSS.

4.2 Review of ASX's framework for the comprehensive management of risk

Under CCP and SSF Standard 3, CS facilities are required to have a sound risk management framework for managing legal, credit, liquidity, operational and other risks. To achieve this, a CS facility is expected to take an integrated and comprehensive view of its risks, including the material risks the facility bears from, and poses to, its participants, its customers, and other entities. During the assessment period the Bank conducted a detailed review of ASX's risk management framework against CCP and SSF Standard 3.

4.2.1 Risk management frameworks

ASX's overarching approach to risk management is set out in its Enterprise Risk Management Framework (ERMF). The ERMF was developed with reference to the international standard for risk management (ISO 31000:2018) and approved by the ASX Ltd Board's Audit and Risk Committee (ARC). Within the structure of the ERMF there are two distinct risk management frameworks specific to the management of clearing and settlement risks, which have been approved by the CS Boards:

- The Settlement Risk Policy Framework outlines the risk management approach for ASX Settlement and Austraclear, setting out a formal structure for the development, governance and review of relevant policy, standards and procedures. The framework, and the policies that sit within the framework, are subject to review every two years, unless an ad hoc review is deemed necessary.
- The Clearing Risk Policy draws together ASX's clearing risk policies into a single policy document. This policy, read in conjunction with ASX's Clearing Risk Policy Roles and Responsibities document, sets out ASX's risk and control framework for the ASX CCPs. This framework includes policies, standards and procedures relevant to the management of counterparty credit, market and liquidity risk. Policies consolidated under this framework are reviewed every two years, unless there is a regulatory requirement for an annual review, or an annual review has been deemed more appropriate.

Framework review

The ERMF is reviewed every two years; the most recent version was approved in November 2019 and the next review is scheduled for completion in September this year. It is appropriate that the ERMF (and the clearing and settlement policy frameworks that sit within it) is subject to periodic review, as well as ad hoc review where there have been material changes.

It is the Bank's expectation that the ERMF, and the clearing and settlement policy frameworks outlined above, should be reviewed during the next assessment period to reflect changes resulting from revisions to the CS Boards Charter in March, the implementation of ASX's new organisational model (refer section 4.1), and the recommendations of this assessment. Consistent with the recommendations in section 4.1, the CS Boards should formally approve all three frameworks, including the ERMF. ASX should also take into account any lessons learned from operational incidents experienced during the assessment period and the replan of the CHESS Replacement program (see sections 2.1.2 and 3.3), in particular to consider whether:

- any gaps in the ERMF contributed to the issues experienced
- the ERMF worked as intended during those events
- any changes are required to address or support recommendations from the IBM review of the ASX Trade outage and the EY reviews of the CHESS Replacement program.

The Bank will monitor how these material developments are reflected in the ERMF and other relevant risk management frameworks.

4.2.2 Roles and responsibilities

ASX's governance structure distributes responsibility for oversight of risk management between the ASX Board, the ARC, the CS Boards and ASX's executive-level Risk Committee:

- *ASX Limited Board.* The Board has ultimate responsibility for ensuring that risk across the ASX Group is managed appropriately, including approving the Risk Appetite Statement and overseeing the effectiveness of the management processes in place for identifying and managing significant risks facing the ASX Group.
- *CS Boards.* ASX's CS Boards are responsible for setting the operational risk tolerances for the CS facilities within the parameters of the Risk Appetite Statement set by the ASX Board. The CS Boards are responsible for approving the risk management framework for the CS licensees and overseeing the management of clearing and settlement risks by the CS facilities. This includes responsibility for oversight of compliance with the FSS.
- *ARC.* The ARC is responsible for reviewing and overseeing the risk management processes, internal controls and compliance systems within the ASX Group, other than for matters covered by the CS Boards.
- *Risk Committee.* Chaired by the CRO, the Risk Committee is responsible for ensuring the adequacy and appropriateness of the risk management frameworks, policies, processes and activities of the ASX Group.[27] The Risk Committee oversees the implementation of the ERMF, and is also charged with ensuring there is an adequate flow of information to the ARC and the CS Boards.

27 The CRO exercises delegated authority from the CEO to manage the framework associated with risk management of ASX and accordingly is the sole decision-maker on the Risk Committee. Other members of the Committee may provide recommendations to the CRO, to assist the CRO in discharging this responsibility.

Three Lines Model

In implementing the ERMF, ASX employs a version of the standard three lines model. The model seeks to clarify responsibilities for risk management, oversight and assurance across the business.

The first line of responsibility for risk at ASX is assigned to operational business areas. Managers of relevant functions are responsible for identifying and monitoring risks relevant to their function's activities, and implementing controls to manage these risks. Management is required to assess the appropriateness and operational effectiveness of these controls twice a year.

Risk management and compliance functions reporting to the CRO are responsible for the second line role. The second line is responsible for overseeing and validating that business areas have appropriately identified, measured, and managed risk within ASX's risk appetite.

Internal Audit undertakes third line responsibilities - assessing ASX's risk management and internal control processes via an independent risk-based assurance programme. ASX's Internal Audit also engages external parties to conduct audits of internal controls from time to time.

4.2.3 Identifying and controlling risk

A key element of ERMF is the identification and assessment of risks and controls. All risks are considered through the prism of seven key risk categories.[28] The ERMF outlines the potential impact of each key risk category and ASX's risk tolerance for each, as determined by ASX's Risk Appetite Statement. ASX's stated tolerance for financial, operational, technology and counterparty risk is 'very low'.

ASX uses key risk indicators (KRIs) to facilitate the assessment, monitoring and management of risk, and ensure risks are measured in a consistent manner against agreed tolerances. KRI tolerance thresholds are used across the organisation, with the aim of ensuring all functions operate within the agreed risk appetite. The broad thresholds against which risks are assessed are: low (no action required but the risk should be monitored), medium (within risk tolerance but attention recommended), and high (response and/or action required). Action plans are implemented as necessary to enhance controls to reduce the likelihood of occurrence (or recurrence) of a risk event or impact from such an event.

Information and control systems

To assist in identifying and managing risks, the ASX CS facilities employ information systems that are intended to provide timely and accurate information relevant to its risk policies, procedures and controls. This includes information on the CS facilities' risk exposures to individual participants, as well as aggregated information on ASX's risk exposures across the CCPs. Key information systems include those used in CCP margining and stress testing, with sufficient information made publicly available for participants to perform their own risk analytics (such as margin calculations).

As noted in Section 2.1.4, in 2019/20 ASX completed the build and rollout of a new Enterprise Risk, Internal Audit & Compliance Application. The new system allows ASX to capture, consolidate and analyse risk, compliance and audit data across dashboards and enhances its ability to 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.

28 The key risk categories are: strategic, operational, technology, counterparty, financial (including capital and liquidity risk), regulatory and legal, and reputation.

4.2.4 Interdependencies

Risk management obligations on participants

CCP Standard 3.3 requires that a CCP provide incentives to participants and, where relevant, their customers, to manage and contain the risks they pose to the facility. CCP Standard 3.2 requires that financial and other obligations imposed on participants by the CCP are proportional to the scale and nature of individual participants' activities.

The ASX CCPs achieve this by the use of controls on participants' positions such as margin and contributions to the default fund in the case of ASX Clear (Futures).[29] These create an incentive for participants to manage the exposures that they bring to the CCP. Participants are also required to post additional collateral or increase their capital levels if they bring exposures that are large relative to the size of their capital.[30]

ASX actively monitors participant exposures and compliance with participation requirements. ASX can institute additional monitoring or action where necessary, such as requiring participants to manage down their exposures.

Risks from and to other entities

CCP and SSF Standard 3.4 requires that a CS facility regularly review the material risks it bears from, and poses to, other entities as a result of interdependencies, and to develop appropriate risk-management tools to address these risks. Other entities could include other FMIs, settlement banks, liquidity providers and service providers.

ASX has a number of processes that can be used to identify risks arising from these types of interdependencies:

- risk assessments when undertaking an expansion of its activities or in the event of material changes to its business
- consideration of critical service provider interdependencies as part of the periodic review of its recovery plan
- mechanisms for measuring, monitoring and managing risks arising from the use of commercial settlement banks by SSF participants under its Settlement Infrastructure Policy
- identification of risks associated with the SSFs' links to other FMIs under the FMI Links Policy
- evaluation, via the annual review of its Liquidity Risk Policy and Liquidity Stress Testing Standard, of the extent to which the CCPs' use of settlement banks, SSFs, RITS, committed liquidity facilities and investment counterparties is a potential source of liquidity risk to ASX.

However, there are some potential gaps in these processes. For example, in relation to SSFs, the scope of the FMI Links Policy excludes consideration of links to payment systems, which means that there is no regular mechanism for the ASX SSFs to assess risks posed to or by RITS, such as through its link with Austraclear. Similarly, the FMI Links Policy does not consider indirect interdependencies with other

29 As ASX Settlement and Austraclear are not exposed to counterparty or liquidity risk, neither facility places financial obligations on their participants under their respective risk management frameworks.

30 A participant of ASX Clear (Futures) that is a bank or, in certain circumstances, a subsidiary of a bank or bank holding company supervised in an ASX-approved jurisdiction, is exempt from this requirement.

FMIs, for example where international central securities depositories such as Euroclear hold Austraclear securities via local custodians.

In relation to CCPs, while ASX has processes in place to identify how other entities could potentially act as a source of liquidity risk for ASX Clear and ASX Clear (Futures), it does not currently conduct a systematic review of how these entities might bring other types of risks, such as operational risks, to the ASX CCPs. Nor does ASX have processes in place to evaluate how ASX CCPs might pose risk to other relevant entities.

Recommendation: ASX should establish a process to periodically conduct systematic assessments of the range of potential risks other entities may pose to its CS facilities and the risks ASX CS facilities could potentially pose to other entities.

4.2.5 Recovery and wind-down planning

CCP and SSF Standard 3.5 requires that CS facilities have processes to identify scenarios that may potentially prevent them from being able to provide their critical operations and services, and to assess the effectiveness of a full range of options for recovery or orderly wind-down.

ASX has a recovery plan in place identifying scenarios that could threaten the CS facilities' ongoing provision of critical services, and sets out how ASX would respond to such scenarios. It describes the suite of tools available in recovery and details the governance arrangements both for the use of these tools and for review of the recovery planning framework. This includes arrangements for the orderly wind down of the ASX CS facilities in certain extreme circumstances. These plans are reviewed annually.

Appendix A: 2020 Areas of Supervisory Focus

Table 7: Summary of Progress Against 2020 Areas of Supervisory Focus

Development	Standard	Facility	Actions
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	The Bank's special topic assessments of the ASX CS facilities' governance and their framework for the comprehensive management of risks are presented in Section 4. The assessment of the facilities' approach to general business risk has been deferred.
Default management and recovery. The Bank will discuss with ASX the establishment of a work plan to enhance its default management and recovery frameworks, taking into account potential gaps identified in the special topic assessment. These include:	CCP Standards 12, 2, 3, 4 7 and 14, SSF Standards 11, 2 and 3	All facilities	
• a review of the legal certainty of arrangements for ASX Limited to replenish ASX contributions to the CCPs' default funds			The review of the legal certainty of arrangements for ASX Limited to replenish contributions to the ASX CCPs' default funds will be progressed alongside the review of the ASX Group support agreement.
• the implementation of planned enhancements to fire drills, lessons learned from the Nasdaq Clearing 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*			ASX will perform a gap analysis against the CPMI-IOSCO paper on default management auctions by September 2021.
• 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			ASX will perform a gap analysis against the CPMI-IOSCO guidance on recovery of financial market infrastructures by December 2021.
• the implementation of enhancements to the default management framework including more frequent audits, an updated approach to default loss estimates and improved documentation.			ASX has developed and documented an updated approach to determining default loss estimates. ASX has set a three to five year frequency for audits of the default management framework. See section 2.3.3.
Review of Planned Work			
Legal basis. Completion of work to enhance, formalise and document business-as-usual (BAU) controls for legal risks.	CCP Standard 1 and SSF Standard 1	All facilities	ASX has updated documentation of its BAU controls for legal risks, see section 2.5.
CCP Resilience Guidance. Implementation of ASX's plans to address gaps against the CCP Resilience	CCP Standards	Both CCPs	The CCPs continue to implement a multi-year work program to address

Guidance that are minor but indicative of good practice in financial risk management.	2, 4, 5, 6, 7 and 15		identified gaps against the CCP Resilience Guidance, see Box A.
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.	CCP Standard 16, SSF Standard 14	All facilities	ASX has progressed work to implement actions set out in its Cyber Strategy roadmap. Work to evaluate technology that could further enhance recovery capabilities is ongoing, see section 2.1.5.
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.	CCP Standard 4, 7	Both CCPs	ASX has introduced four new stress test scenarios and consulted with participants on the boundary of 'extreme but plausible', see section 2.2.1.
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 has enhanced its monitoring of concentration in security collateral and plans to introduce haircuts to disincentivise concentrated collateral holdings, see section 2.2.1.
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 Bank will commence this review once any changes to the ASX Group Support Agreement necessary to support the revised arrangements for CS facility business, operational and investment risk capital have been made, see section 2.5.

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 DvP arrangements incorporated within the settlement process.

The ASX Group operates two CCPs and two SSFs:

- *ASX Clear Pty Limited* provides CCP services for ASX-quoted cash equities, debt products and warrants traded on the ASX and Chi-X markets, equity-related derivatives traded on the ASX market, Chi-X-quoted warrants, Transferable Custody Receipts and funds traded on Chi-X, and National Stock Exchange of Australia Pty Ltd (NSXA) quoted securities traded on the NSXA market. The provision of CCP services for Chi-X and NSXA 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) Pty Limited* 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).[31]
- *ASX Settlement Pty Limited* 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 NSXA and the Sydney Stock Exchange Limited. ASX Settlement also provides for subscriptions and redemptions in unlisted managed funds through the mFund Settlement Service.

31 Equity index futures and options on these futures are cleared through ASX Clear (Futures), while options over equity securities or indexes are cleared through ASX Clear.

- *Austraclear Limited* 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).

In the ASX corporate structure, the two CCPs – ASX Clear and ASX Clear (Futures) – are subsidiaries of ASX Clearing Corporation Limited (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.

The CRO, who heads the Risk group, is responsible for providing executive oversight of ASX's Clearing Risk Policy 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 (refer section 4.2).

During the assessment period, the Chief Operating Officer (COO) was responsible for providing executive oversight of the frontline management of risks under ASX's Settlement Risk Policy Framework.[32] The COO was also responsible for the delivery of overall operations of the ASX Group and reported directly to the CEO, as did the CRO. Both the COO and CRO had a direct reporting line to the CS Boards and attended 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 Oversight (CRQO) is responsible for the development of clearing risk management systems, maintaining and validating CCP risk and pricing models and the oversight of clearing participant exposures. Clearing Risk Policy (CRP) develops and maintains CCP and SSF policies and standards.
- Counterparty Risk Assessment (CRA) monitors clearing participants adherence with the ASX CCPs capital rules and liquidity guidance and sets the Stress Test Exposure Limits (STELs) for clearing participants.
- 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.

32 As noted in Section 4.1.5, there has been ongoing change to the operating model of the ASX Group described in this section following the end of the assessment period.

- 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 role of the Risk Committee is to advise the CRO on risk management decisions in the exercise of his or her delegated authority from the CEO.
- The Regulatory Committee manages the processes associated with the development and evolution of ASX policy 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) was responsible for advising the members of the TOSC (including CEO, CIO, CRO, COO and the GM Technology Security and Governance) 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:

- The 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.
- The Default Management and Recovery Working Group (DMRWG) provides oversight of the CCP's default management and recovery framework (DMRF). The DMRWG is chaired by the CRO.
- Credit Risk Working Group (CRWG) was established during 2020/21 to share information related to clearing participants including their capital, profitability, liquidity, market indicators of creditworthiness and STELs as well as the results of periodic/thematic reviews conducted by the CRA team. The CRWG also recommends the addition or removal of participants from the clearing participant watchlist. The CRWG is chaired by the CRO and includes representatives from the various teams in Clearing Risk and also Participants Compliance.
- The Participant Incident Response Group (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, review of technology KRIs, tracking the closure of actions to mitigate

risks and address audit findings, and the annual review of risk profiles, with the outcomes being reported to the TOSC. The TRWG is chaired by the Chief Information Officer and meets monthly.

In addition to the internal forums that ASX operates, the views of participants and other stakeholders are sought through external standing forums:

- The ASX Clear (Futures) Default Management Group (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, interest rate derivatives 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' 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. In addition, the Bank is responsible 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 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.[33] Based on the information gathered, the Bank undertakes regular assessments of the ASX CS facilities.

The ASX CCPs are recognised by the 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 2.6.3 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 the 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 Swiss Financial Market Supervisory Authority (FINMA) also recognises ASX Clear (Futures) as a foreign central counterparty, which allows it to grant Swiss market participants supervised by FINMA direct access to its facilities as clearing participants.

The Bank has an MoU with the RBNZ which establishes cooperation arrangements relevant to ASX Clear (Futures)' activities in NZD-denominated products. ASX Clear (Futures) has been designated as a settlement system under the RBNZ Act (see section 2.6.3).

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

33 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>.

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 net tangible assets (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 12-month liquidity plan.

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.
- *Additional initial margin (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.[34]

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,

34 Only initial margin is collected at the 2:00 am intraday margin call for ASX Clear (Futures) participants that are active during the overnight session.

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 61 per cent of margin requirements in ASX Clear and 96 per cent of AUD-denominated margin requirements in ASX Clear (Futures) were met in cash during the assessment period. In ASX Clear, equity securities comprised the remaining collateral. In ASX Clear (Futures), approximately three per cent of total collateral was held in foreign currency on average in 2020/21, while four 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 2020/21, 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.[35] 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 2).

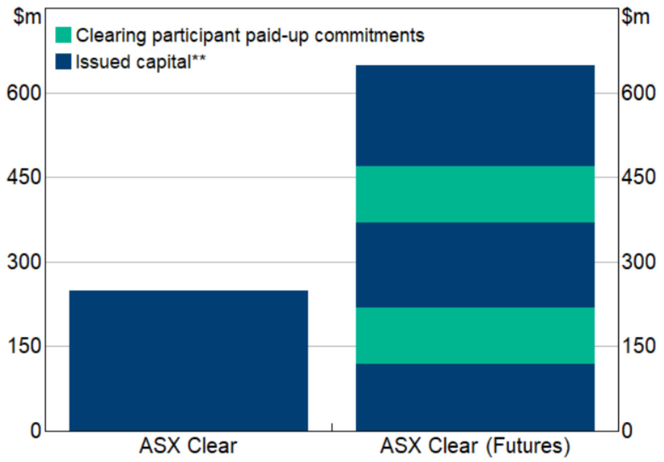
- ASX Clear's default fund was $250 million over the assessment period. This comprised $178.5 million of own equity and $71.5 million paid into a restricted capital reserve from the National Guarantee Fund in 2005.
- ASX Clear (Futures)' default fund was $650 million over the assessment period. This 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 2020/21.

Graph 2

Prefunded Pooled Financial Resources*

As at end June 2021



* 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

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

Credit stress tests

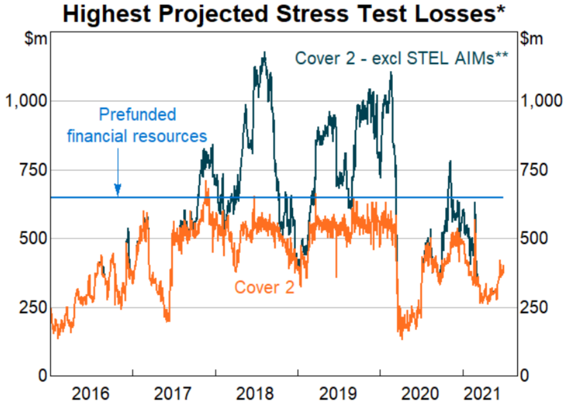
In order to assess the adequacy of its financial resources to cover its current and potential future credit exposures, the CCPs perform daily credit stress tests. These tests compare each CCP's available prefunded resources against the largest potential loss in the event of the joint default of two participants 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.

Neither ASX Clear (Futures) (Graph 3) or ASX Clear (Graph 4) experienced any days on which their credit stress test Cover 2 requirement exceeded their respective prefunded financial resources in 2020/21.

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, 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 65 days against four participants in total, with the largest totalling $86 million. ASX Clear (Futures) made STEL AIM calls on 162 days against six participants in total, with the largest call totalling $339 million.

Graph 3

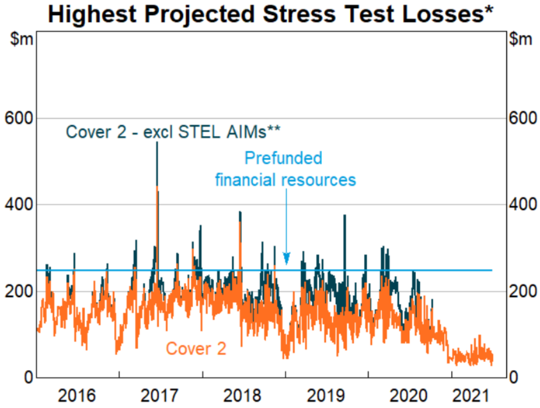
ASX Clear (Futures): Highest Projected Stress Test Losses*



* 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 4

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 also create liquidity exposures. The CCPs may also face additional default liquidity exposures in excess of their credit exposures, due to the timing of when payment obligations fall due. These additional exposures may be particularly large for ASX Clear, since it clears equity trades with delivery obligations. For example, if a participant with net equity purchase obligations were to default, ASX Clear's initial liquidity exposure would include the cost of settling the payment obligations of the defaulted participant. However, the CCP must wait two days for funds to become available from selling the purchased securities, due to the T+2 settlement cycle. 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 their 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. Cover 2 cash market liquidity exposures regularly exceeded the buffer over 2020/21, in which case ASX Clear would have had to rely on offsetting transactions arrangements (OTAs, which are essentially liquidity commitments from its participants) to settle any exposures above the buffer. The buffer also implicitly defines a liquidity threshold for ASX Clear's derivatives-market exposures of $350 million. During the assessment period, liquidity exposures at both ASX Clear and ASX Clear (Futures) remained within their respective thresholds.

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. 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 (i.e. no market risk on its net positions) via partial or complete termination of contracts at their current market value if normal close-out processes cannot be carried out.

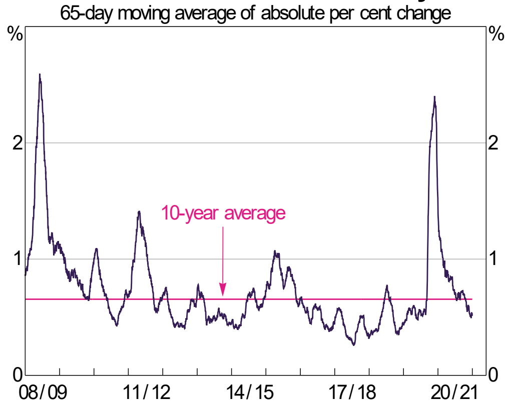
ASX has established a staged process for replenishment of the CCPs' default funds in the event that these were exhausted or partially drawn down following a participant default. At the end of a 22 business-day 'cooling-off period' following the management of a default, ASX Clear's and ASX Clear (Futures)' default funds would be replenished up to $150 million and $400 million, respectively.

B.4 Activity and participation

Central counterparties

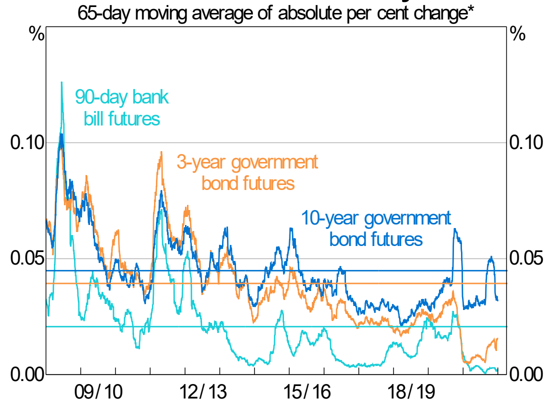
Australian market conditions stabilised during the assessment period, with average volatility in products cleared by ASX CCPs declining to below long-term averages following the heightened volatility related to the onset of COVID-19 in 2019/20. Average volatility in equity prices (as measured by the 65-day moving average of daily absolute percentage changes in the S&P ASX All Ordinaries Index) decreased by 18 per cent to 79 basis points when compared to the previous year. Volatility in equity prices continued to trend downwards in 2020/21, falling below its long-term average towards the end of the period (Graph 5). While volatility in bond futures rose in early 2021 alongside similar trends in offshore markets, these increases were largely unwound towards the end of the assessment period. Volatility for key interest rate contracts was below long-term average levels at the end of the period, with volatility in 90-day bank bill and three-year Treasury bond futures around the lowest levels over the past decade owing to the Bank's three-year Australian Government bond yield target and expectations that the Bank's cash rate target will remain unchanged for some time (Graph 6).

Graph 5
All Ordinaries Market Volatility
65-day moving average of absolute per cent change



Sources: ASX; Bloomberg

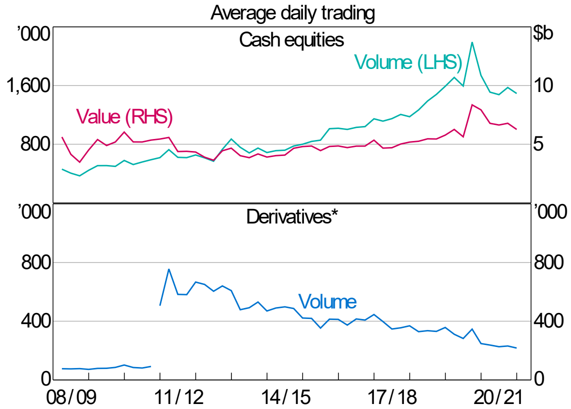
Graph 6
ASX 24 Market Volatility
65-day moving average of absolute per cent change*



* Horizontal lines indicate the 10-year average for each series
Sources: ASX; Bloomberg

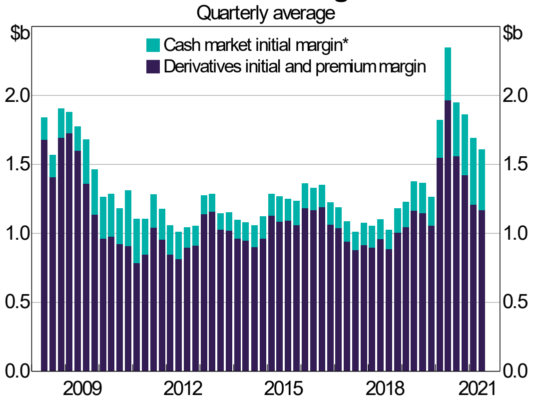
Trading activity in both cash equities and ETOs gradually declined over 2020/21 (Graph 7). Despite the decline in trading activity, initial margin requirements in ASX Clear increased over 2020/21 due to margin rates on equities products increasing relative to the previous period.[36] ASX Clear's total margin for ETOs rose by 7 per cent to an average of $1.1 billion over 2020/21 compared with 2019/20, while initial margin for cash equities trades rose by 64 per cent to an average of $439 million (Graph 8). 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 7
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 8
ASX Clear Margin
Quarterly average



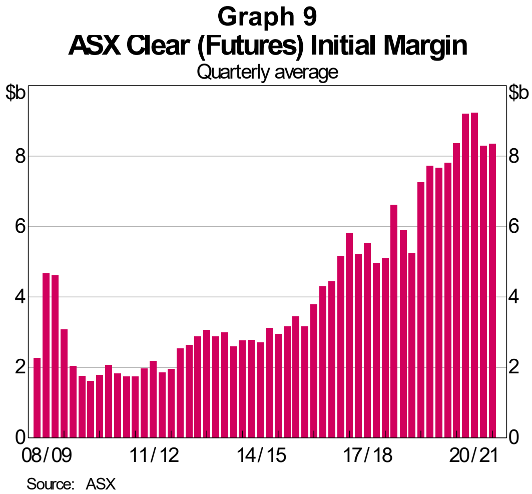
* Notional amount until 7 June 2013; Real Risk methodology used until 18 July 2012, Cash Market Margining used thereafter
Source: ASX

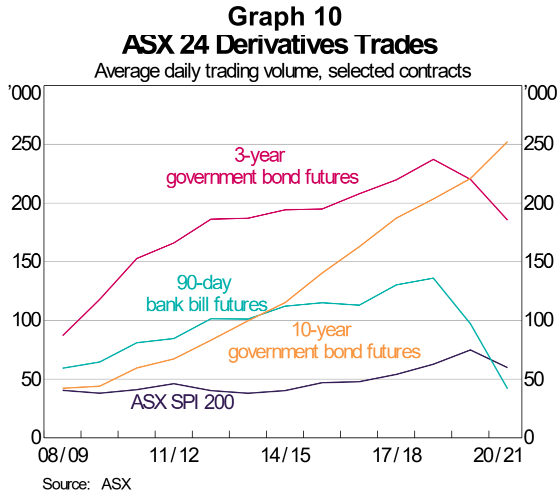
Exposures at ASX Clear (Futures) grew by 12 per cent to $9 billion on average, as measured by initial margin held (Graph 9). These exposures primarily arise from the four major contracts cleared – SPI 200 equity index futures, the three-year and 10-year Treasury bond futures and 90-day bank bill futures – which accounted for around 96 per cent of total transactions cleared at ASX Clear (Futures) in 2020/21.

Transaction volumes on ASX 24 experienced mixed growth in 2020/21, decreasing across the SPI 200 futures contracts, three-year Treasury bond futures and 90-day bank bill futures contracts, while

36 In response to the COVID-19 outbreak, ASX increased its initial margin settings for equity products in the first half of 2020.

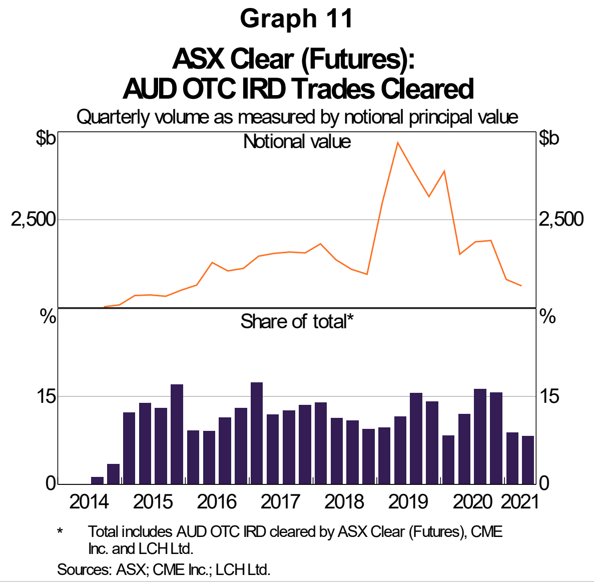
increasing for the 10-year Treasury bond futures (Graph 10). The decline in trading volumes in the 90-day bank bill and three-year Treasury bond futures contracts is likely at least partly driven by the aforementioned fall in the volatility of these contracts to historically low levels.





The average daily value of AUD OTC IRDs cleared by ASX Clear (Futures) decreased by 58 per cent to $1.3 billion over the period as volatility in rates markets declined (Graph 11). The share of these products cleared by ASX Clear (Futures) decreased by two percentage points to an average of 12.2 per cent in 2020/21.

ASX Clear had 33 direct participants as at 30 June 2021. There were 20 direct clearing participants in ASX Clear (Futures).

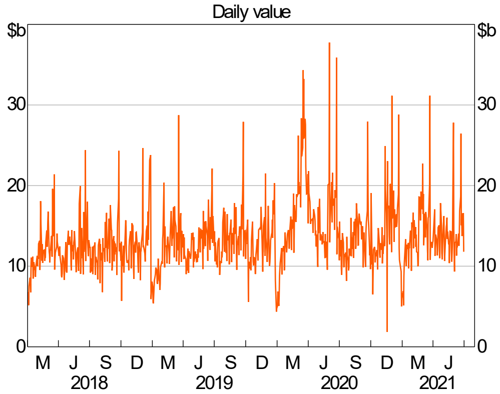


Securities settlement facilities

The daily average value of cash equity settlements in ASX Settlement decreased by around six per cent to $11.5 billion in 2020/21. This is consistent with the decline in cash equities trading activity in the ASX market, although 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. The 2020/21 peak daily activity of $31 billion occurred in March, which was below the 2019/20 peak of $38 billion (see Graph 12).

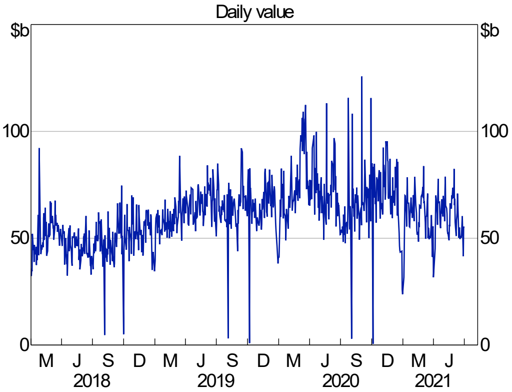
In 2020/21, the average daily value of debt securities settled in Austraclear decreased by 7 per cent, to $63.8 billion. Daily DvP transactions exceeded the previous peak of $113.2 billion on three occasions between July and September 2020, with a maximum value of $125.7 billion being settled on 2 September 2020 (see Graph 13). All three peak days were driven by the settlement of new bonds issued by the Australian Government.

Graph 12
Net Settlements in ASX Settlement*



* Both novated and non-novated settlements
Source: ASX

Graph 13
DvP Transactions in Austraclear



Source: ASX

B.5 Operational performance

ASX manages its operational risks in the context of its group-wide ERMF, 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 6). 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 6: ASX CS Facility System Availability and Usage Statistics for 2020/21

Facility	Core system	Availability (per cent)	Peak usage (per cent)	Average usage (per cent)
ASX Clear	DCS	100	19	6
ASX Clear / ASX Settlement	CHESS[a]	100	47	26
ASX Clear (Futures)	Genium	100	23	10
ASX Clear (Futures)	Calypso	100	38	35
Austraclear	EXIGO	100	37	24

(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.

ASX did not experience any incidents during the assessment period that affected the availability of CS facility systems. However, ASX did experience an incident in November that impacted the CHESS system without affecting system availability when the completion of the CHESS settlement batch was delayed by around 3½ hours (see section 3.3).

Appendix C: The Assessment Framework

This 2021 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 2021. 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*.[37] 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 must, to the extent that it is 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 the Bank's regular liaison with ASX staff
- as part of detailed review against specific FSS ('special topics')
- via the supply of regular data and reports by ASX
- through a series of specific information requests and meetings with ASX during and immediately following the assessment period.

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

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.[38] This supplementary interpretation 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.

38 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>.

Abbreviations

ACCC	Australian Competition and Consumer Commission
AGS	Australian Government Securities
AIM	Additional initial margin
AMO	Approved Market Operator
APRA	Australian Prudential Regulation Authority
ARC	Audit and Risk Committee
ASIC	Australian Securities and Investments Commission
ASX	Australian Securities Exchange
ASXCC	ASX Clearing Corporation
ASXSOR	ASX Settlement Operating Rules
AUD	Australian dollar
BAU	Business-as-usual
BCBS	Basel Committee on Banking Supervision
BoE	Bank of England
CBPL	Capital-based position limit
CCP	Central counterparty
CEO	Chief Executive Officer
CFR	Council of Financial Regulators
CHESS	Clearing House Electronic Sub-register System
CIO	Chief Information Officer
CME	Chicago Mercantile Exchange
COO	Chief Operating Officer
CPMI	Committee on Payments and Market Infrastructures
CRA	Counterparty Risk Assessment
CRO	Chief Risk Officer
CRP	Clearing Risk Policy
CRQO	Clearing Risk Quantification and Oversight
CRWG	Credit Risk Working Group
CS	Clearing and settlement
DA	Digital Asset
DCS	Derivatives Clearing System
DLT	Distributed-ledger technology
DMC	Default Management Committee
DMG	Default Management Group
DMRF	Default Management and Recovery Framework
DMRWG	Default Management and Recovery Working Group
DvP	Delivery-versus-payment
EMIR	European Market Infrastructure Regulation
ERICA	Enterprise Risk, Internal Audit & Compliance Application
ERMF	Enterprise Risk Management Framework
ESMA	European Securities and Markets Authority
ETO	exchange-traded option
EU	European Union
EUR	Euro
FINMA	Financial Market Supervisory Authority
FMI	Financial market infrastructure
FSB	Financial Stability Board
FSS	Financial Stability Standard(s)
GBP	British pound sterling
IBM	International Business Machines Corporation
ICC	Inter-commodity spread concession
IMF	International Monetary Fund
IRD	Interest rate derivatives
IOSCO	International Organization of Securities Commissions

ITSM	IT Service Management
JPY	Japanese yen
KRI	Key risk indicator
LST	Liquidity stress testing
MoU	Memorandum of understanding
MPOR	Margin period of risk
NBFI	Non-bank financial intermediaries
NBO	Net broker obligation
NSXA	National Stock Exchange of Australia
NTA	Net tangible assets
NZD	New Zealand dollar
OTA	Offsetting transaction arrangement
OTC	Over-the-counter
PFMI	Principles for Financial Market Infrastructures
PIRG	Participant Incident Response Group
PSB	Payments System Board
PSNA	Payment Systems and Netting Act 1998
RBNZ	Reserve Bank of New Zealand
RITS	Reserve Bank Information and Transfer System
RCC	Risk Consultative Committee
RQWG	Risk Quantification Working Group
SPAN	Standard Portfolio Analysis of Risk
SSF	Securities settlement facility
STEL	Stress test exposure limit
TAS	Trade Acceptance Service
TMC	Tailor Made Combinations
TOSC	Technology, Operations and Security Committee
TRR	Temporary Recognition Regime
TRWG	Technology Risk Working Group
UK	United Kingdom
USD	United States dollar