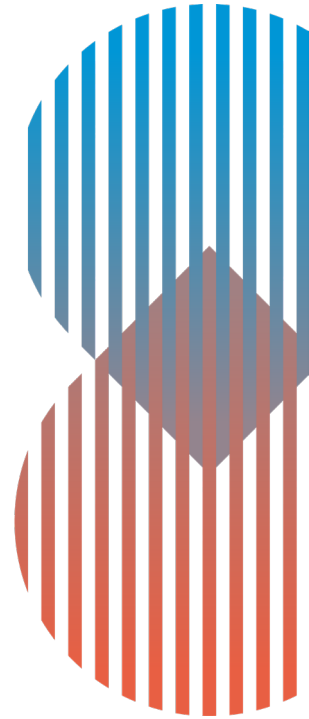


DTCC FICC RISK MANAGEMENT FORUM 2022



SUBMIT YOUR QUESTIONS



Go to
pigeonhole.at

Enter passcode

FICCDAY2

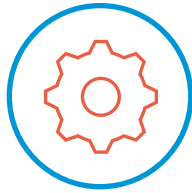


RISK MANAGEMENT CAPABILITIES & TECHNOLOGY

Tim Cuddihy - Managing Director and Group Chief Risk Officer, DTCC

Laura Klimpel - General Manager of FICC and Head of SIFMU Business Development, DTCC

DTCC Risk Management Capabilities & Technology Background



The Risk Technology Initiative is designed to **modernize DTCC risk systems** in order to continue to support risk management capabilities.



Technology enhancements implemented to date include a comprehensive data warehouse, data integrity checks, improved intra-day risk monitoring and margin requirements, automated workflow tools, enriched reporting, and enhanced model capabilities and governance.



The Risk Technology Initiative **continues to evolve** to support new technology and risk capabilities.

FICC Risk Management Technology Capabilities

Since the launch of the Risk Technology Initiative, FICC has enhanced the risk management technology capabilities aligned with the following themes:



Monitoring and Surveillance



Operational Excellence, Resilience and Data Integrity



Margin Model Development and Governance

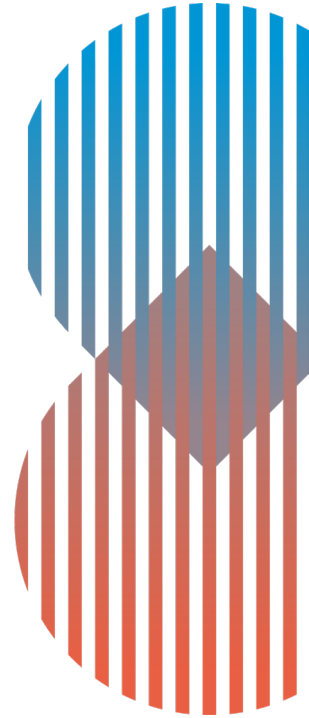


Stress Testing



Liquidity Risk Management

MONITORING AND SURVEILLANCE



FICC Risk Management Technology Capabilities

Monitoring & Surveillance

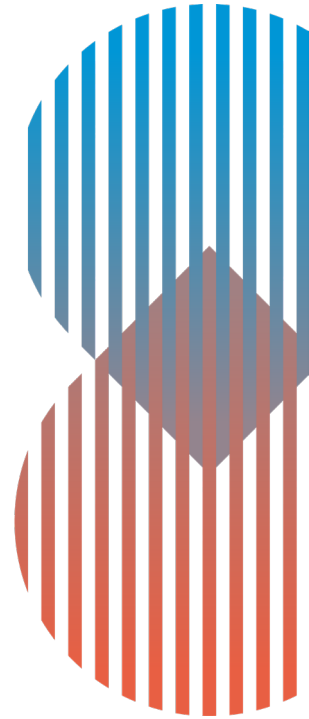
- Re-designed components and ongoing efforts focus on the use of automation, alerting and advanced data management/analytics across all areas of risk.
- FICC market risk analysts perform enhanced intra-day monitoring utilizing hourly trade, mark-to-market and VaR processing. Capabilities for 15-minute monitoring are available and workflow/reports would be modified as part of FICC Common Margining or US Treasury Clearing expansion.
- Implemented automated workflow and advanced portals with thresholds and alerts for FICC market risk analysts.

FICC Risk Management Technology Capabilities

Monitoring & Surveillance

- Credit Risk analysts also utilize workflow in front-end to perform daily tasks through automation of member alerts, thresholds, and reporting.
- Self-service tools introduced supporting FICC allow for direct access to historical data to respond to stakeholder requests.
- Risk Management as a Service supports start-of-day and intra-day portfolio and margin transparency as well as the inclusion of client calculators for members to perform 'what-if' calculations for insights into potential impacts based on hypothetical transactions.

MARGIN MODEL DEVELOPMENT AND GOVERNANCE



FICC Risk Management Technology Capabilities

Margin Model Development & Governance

- FICC's Value-at-Risk calculations at both end of day and intraday utilize sensitivity VaR, including approximately 50 risk factors and a 10+ year look-back period to calibrate initial margin requirements.
- Capabilities are being proposed to enhance cross-margin efficiencies with CME.
- FICC may collect a Margin Liquidity Adjustment Charge to address the risk when a Member's portfolio contains large net unsettled positions in a particular group of securities.

FICC Risk Management Technology Capabilities

Margin Model Development & Governance

- The Clearing Agency Model Risk Management (MRM) Framework identifies, measures, monitors, and manages model risk. DTCC engaged a consulting firm in late 2019 to perform a full assessment of its MRM function and capabilities with respect to regulatory expectations and to benchmark against industry standards. A roadmap was developed and completed to strengthen the overall framework in line with regulatory requirements and industry best practices.
- Significant enhancements have occurred in model performance monitoring that have increased the granularity and focus of reports.
- Increased monitoring of and engagement with data vendors and model teams to assess on-going performance and model validation requirements.

FICC Risk Management Technology Capabilities

Margin Model Performance 2Q Disclosures

FICC publishes quantitative disclosures that include data on key aspects of our risk framework, including margin, backtesting, stress testing, and liquidity. Certain portions of these disclosures are copied below. Full disclosures are available at: <https://www.dtcc.com/legal/policy-and-compliance>

Disclosure Reference	Disclosure Description	Frequency	Data Type	FICC		
				GSD	MBSD	
Disclosure 4.3 – Value of pre-funded default resources (excluding initial and retained variation margin) held for each clearing service						
4.3.1	Cash deposited at a central bank of issue of the currency concerned	Pre-Haircut	Quarterly / Quarter-End	USD \$MM	10,629	3,171
		Post-Haircut		USD \$MM	10,629	3,171
4.3.4	Unsecured cash deposited at commercial banks	Pre-Haircut		USD \$MM	520	145
		Post-Haircut		USD \$MM	520	145
4.3.5	Non-Cash Sovereign Government Bonds – Domestic	Pre-Haircut		USD \$MM	14,080	5,540
		Post-Haircut		USD \$MM	13,552	5,354
4.3.7	Non-Cash Agency Bonds	Pre-Haircut		USD \$MM	1,975	286
		Post-Haircut		USD \$MM	1,837	266
4.3.15	In total. Reported as at quarter end; Pre-Haircut and Post-Haircut	Pre-Haircut	USD \$MM	27,204	9,142	
		Post-Haircut	USD \$MM	26,538	8,936	

FICC Risk Management Technology Capabilities

Margin Model Performance 2Q Disclosures

- The Federal Reserve raised interest rates twice by 50 basis points in May 2022 and 75 basis points in June 2022 and there is uncertainty surrounding the U.S. economy with decades high inflation rates, Fed tightening, and surging commodity prices. However, unemployment figures remain at 50-year lows and jobs reports were stronger than expected. The yields on U.S. treasuries continued increasing throughout the course of the second quarter of 2022. The 10-year U.S. Treasury yield increased from 2.32% at the beginning of the quarter to 2.97% at the quarter end due to inflationary fears and anticipated monetary policy tightening by The Federal Reserve. The U.S. Treasury curve inverted briefly on April 1, 2022, remained flat throughout the quarter and eventually inverted at the beginning of July 2022.
- Backtesting is designed to measure the sufficiency of the Clearing Fund coverage by comparing a Member's Required Fund Deposit to the 3-day observed P&L for the Member's portfolio and aggregated into the CCP-level backtesting coverage data that is provided. Backtesting assesses the adequacy of a 3-day liquidation period assumption in the event of Member default, and all VaR models are currently calibrated at a minimum of 99% coverage.

FICC Risk Management Technology Capabilities

Margin Model Performance 2Q Disclosures

GSD MARGIN PERFORMANCE DISCLOSURES

- At the end of the second quarter of 2022, GSD's 12-month backtesting coverage level was 98.7%. The 1-month coverage ratio at GSD was 97.7% for April, 99.1% for May, and 94.2% for June.
- The increased number of the backtesting deficiencies in June resulted in the 12-month backtesting coverage declining to below 99%. The majority of the backtesting deficiencies in June occurred at the beginning of the month when the Federal Reserve raised interest rates by 75 basis points.
- The largest deficiency for the quarter and 12-month period was for \$995.3MM incurred on 06/09/2022. It was driven by a large 3-day upward movement in US Treasury yields (+62bps at the 2yr, +45bps at the 10yr and +27bps at the 30yr points of the curve).
The median backtesting deficiency for the quarter was \$5.6 million.

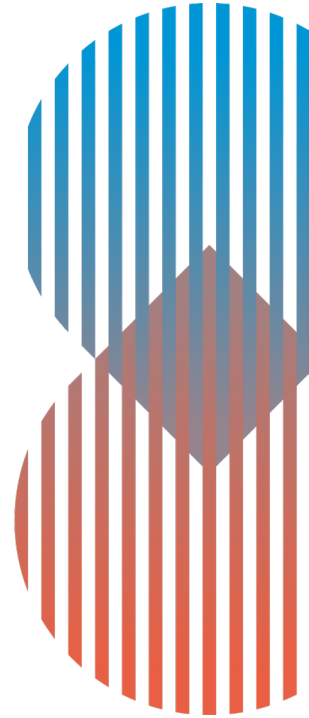
FICC Risk Management Technology Capabilities

Margin Model Performance 2Q Disclosures

MBSD MARGIN PERFORMANCE DISCLOSURES

- At the end of the second quarter of 2022, MBSD's 12-month backtesting coverage level was 99.4%. The 1-month coverage ratio at MBSD was 99.8% for April, 100.0% for May, and 94.2% for June. June backtesting deficiencies occurred at the beginning of the month when the Federal Reserve raised interest rates by 75 basis points, and towards the end of the month amid recessionary pressures.
- The largest deficiency for the quarter and 12-month period was for \$898.9MM incurred on 06/09/2022. It was driven by a large 3-day downward movement in TBA prices (for reference, the 4.0% 30yr UMBS experienced a 3-day price drop of 3 points + 1 tick and the 4.0% 30yr GNMA II experienced a 3-day price drop of 2 points + 18 ticks). The median backtesting deficiency for the quarter was \$4.6 million

STRESS TESTING



FICC Risk Management Technology Capabilities

Stress Testing

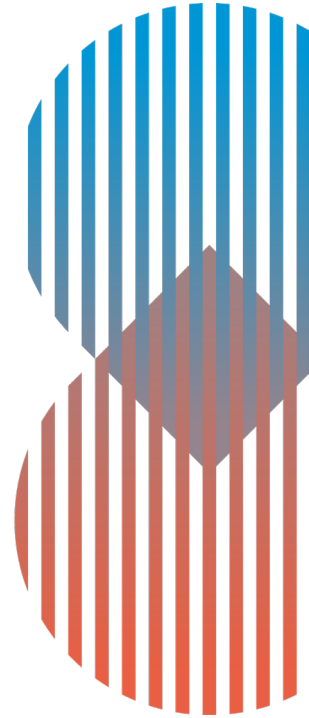
- FICC employs stress-testing to determine coverage levels for potential losses in a portfolio incurred under extreme, but plausible market conditions.
- While the initial margin model calibration provides coverage at a 99% confidence interval, historical and hypothetical stress scenarios measure the sufficiency of available financial resources and impact of potential events that could exceed the model's 99% confidence interval.
 - Historical scenarios are based on stressed market conditions as they have occurred on specific dates in the past. FICC generally considers at least 10 years of historical data and applies certain historical scenarios beyond the 10-year data range to establish a comprehensive set of historical scenarios.
 - Hypothetical scenarios are forward-looking scenarios designed to supplement historical scenarios and to cover macroeconomic and other market conditions that may not have been covered adequately by historical scenarios.
- FICC's prefunded financial resources consist of Member's Required Fund Deposits to the Clearing Fund in the form of cash and/or eligible securities, with any such eligible securities being subject to a haircut.

FICC Risk Management Technology Capabilities

Stress Testing 2Q Disclosures

Disclosure Reference	Disclosure Description	Frequency	Data Type	FICC		
				GSD	MBSD	
Disclosure 4.4 – Credit Risk Disclosures						
4.4.1	State whether the CCP is subject to a minimum "Cover 1" or "Cover 2" requirement in relation to total pre-funded resources	Quarterly		Cover 1	Cover 1	
4.4.2	For each clearing service, state the number of business days within which the CCP assumes it will close out the default when calculating credit exposures that would potentially need to be covered by the default fund.		Business Days	3	3	
4.4.3	For each clearing service, the estimated largest aggregate stress loss (in excess of initial margin) that would be caused by the default of any single participant and its affiliates (including transaction cleared for indirect participants) in extreme but plausible market conditions (Previous 12 Months)		Peak Day / Previous 12 Months	USD \$MM	2,080	3,378
			Mean Average / Previous 12 Months	USD \$MM	1,555	2,456
4.4.4	Report the number of business days, if any, on which the above amount (4.4.3) exceeded actual pre-funded default resources (in excess of initial margin)		Business Days	0	0	
4.4.5	The amount in 4.4.4 which exceeded actual pre-funded default resources (in excess of initial margin) (Previous 12 Months)		Amount Exceeded / Previous 12 Months	USD \$MM	0	0

LIQUIDITY RISK MANAGEMENT



FICC Risk Management Technology Capabilities

Liquidity Risk Management

- Clearing Fund cash deposits and cash available under the rules-based Capped Contingency Liquidity Facilities (CCLFs) are the “qualified liquid resources” for FICC.
- FICC continuously monitors and sizes Members’ commitments to the CCLFs as necessary to meet expected liquidity needs across a wide range of historical and hypothetical stress scenarios.
- Liquidity Risk staff access front-end portal, alerting and automated workflow/reporting. FICC liquidity needs are calculated hourly and liquidity resources are calculated consistent with the Daily Liquidity Study assumptions.

FICC Risk Management Technology Capabilities

Liquidity Risk Management

- FICC may also access liquidity through third-party MRAs, if and when it determines it is appropriate to do so. FICC performs a Repo Study to estimate available market capacity and applies stress assumptions to assess potential use during a default.
- The liquidity risk impact of the proposed Treasury Clearing mandate will depend on the access models that are developed as part of the implementation of those rules. As reference, implementation of the GSD Sponsored Service that did not require significant changes to liquidity resources. Any additional liquidity needs will be closely monitored and are expected to be met through monitoring and scheduled adjustments to CCLF.

FICC Risk Management Technology Capabilities

Liquidity Risk 2Q Disclosures

Disclosure Reference	Disclosure Description		Frequency	Data Type	FICC	
					GSD	MBSD
Disclosure 7.1 - Liquidity Risk						
7.11	State whether the clearing service maintains sufficient liquid resources to 'Cover 1' or 'Cover 2'		Quarterly / Quarter End		Cover 1	Cover 1
7.12	Size and composition of qualifying liquid resources for each clearing service; (a) Cash deposited at a central bank of issue			USD \$MM	10,629	3,171
7.13	Size and composition of qualifying liquid resources for each clearing service; (b) Cash deposited at other central banks			USD \$MM	0	0
7.14	Size and composition of qualifying liquid resources for each clearing service; (c) Secured cash	Repo Only		USD \$MM	0	0
7.15	Size and composition of qualifying liquid resources for each clearing service; (d) Unsecured cash deposited at commercial banks	Commercial Bank Deposits		USD \$MM	520	145
		Money Market Funds		USD \$MM	0	0
		US Treasury Bills		USD \$MM	0	0
7.16	Size and composition of qualifying liquid resources for each clearing service; (e) secured committed lines of credit (i.e. those for which collateral/security will be provided by the CCP if drawn) including committed foreign exchange swaps and committed repos			USD \$MM	86,798	50,619
7.17	Size and composition of qualifying liquid resources for each clearing service; (f) unsecured committed lines of credit (i.e. which the CCP may draw without providing collateral/security)			USD \$MM	N/A	N/A
7.18	Size and composition of qualifying liquid resources for each clearing service; (g) highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements even in extreme but plausible market conditions			USD \$MM	16,055	5,826
7.19	Size and composition of qualifying liquid resources for each clearing service; (h) other			USD \$MM	0	0
7.110	State whether the CCP has routine access to central bank liquidity or facilities.			N/A	N/A	
7.111	Details regarding the schedule of payments or priority for allocating payments, if such exists, and any applicable rule, policy, procedure, and governance arrangement around such decision making.			N/A	N/A	

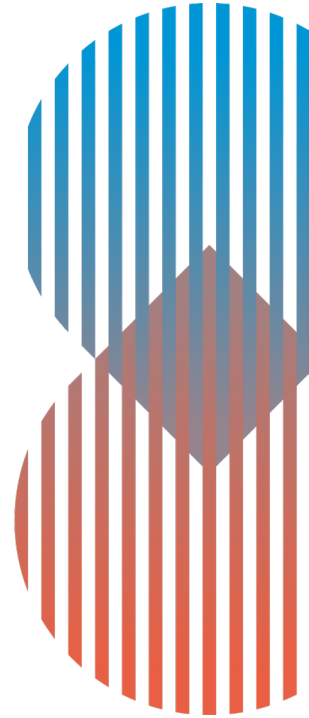
FICC Risk Management Technology Capabilities

Liquidity Risk 2Q Disclosures

- FICC did not experience a default event nor did any Member fail to satisfy payment obligations in Q2 2022 so that were no default liquidity requirements at that time.
- The values set forth in the disclosures below are estimated liquidity obligations, post-netting, based on trades that are due to settle the following business day.

Disclosure Reference	Disclosure Description	Frequency	Data Type	FICC	
				GSD	MBSD
Disclosure 7.3 – Liquidity Risk					
7.3.1	Estimated largest same-day and, where relevant, intraday and multiday payment obligation in total that would be caused by the default of any single participant and its affiliates (including transactions cleared for indirect participants) in extreme but plausible market conditions	Forward looking / Quarterly	USD \$MM	54,637	30,922
7.3.2	Number of business days, if any, on which the above amount exceeded its qualifying liquid resources (identified as in 7.1 and available at the point the breach occurred), and by how much	Quarterly	Business Days	0	0
7.3.3			USD \$MM	0	0
7.3.4	Actual largest intraday and multiday payment obligation of a single participant and its affiliates (including transactions cleared for indirect participants) over the past twelve months; Peak day amount in previous twelve months	Previous 12 Months	USD \$MM	66,768	30,922
7.3.5	Estimated largest same-day and, where relevant, intraday and multiday payment obligation in each relevant currency that would be caused by the default of any single participant and its affiliates (including transactions cleared for indirect	Forward looking / Quarterly	USD \$MM	54,637	30,922
7.3.6	Number of business days, if any, on which the above amounts exceeded its qualifying liquid resources in each relevant currency (as identified in 7.1 and available at the point the breach occurred), and by how much	Quarterly	Business Days	0	0
7.3.7			USD \$MM	0	0

OPERATIONAL EXCELLENCE, RESILIENCE AND DATA INTEGRITY



FICC Risk Management Technology Capabilities

Operational Excellence, Resilience and Data Integrity

- Enhanced risk processes, applications and infrastructure to expand capabilities, reduce complexity and minimize disruption of critical financial and non-financial risk functions as well as reducing operational risk incidents for FICC.
- On premises Data Warehouse moved to a third-party cloud platform and includes all historical data (7+ years) for FICC.
- Data Integrity analysts utilize an external vendor for FICC back testing, stress testing, and regulatory reporting. Automated Portal and Workflow launched to support Data Integrity exception analysis.
- Volume-weighted average prices launched allowing a new paradigm of monitoring price exceptions.
- Migrated all risk applications in order to reduce key person risks of declining infrastructure resources.
- Enhanced resiliency of engines and have alternate for processing margin calculations in the event of data unavailability.

FICC Risk Management Technology Capabilities

Operational Excellence 2Q Disclosures

Disclosure Reference	Disclosure Description	Frequency	Data Type	FICC		NSCC
				GSD	MBSD	
Disclosure 17.1 – Operational availability target for the core system(s) involved in clearing (whether or not outsourced) over specific period for the system						
17.1.1	Operational availability target for the core system(s) involved in clearing (whether or not outsourced) over specified...	Quarterly	Percentage	99.6%	99.6%	99.6%
Disclosure 17.2 – Actual availability of the core system(s) over the previous twelve month period						
17.2.1	Actual availability of the core system(s) over the previous twelve month period	Quarterly	Percentage	99.94%		
Disclosure 17.3 – Total number of failures						
17.2.1	Total number of failures and duration affecting the core system(s) involved in clearing over the previous twelve month period (Duration of Failure)	Quarterly	Count / hh:mm:ss	3 / 1:44:00		
Disclosure 17.4 – Recovery time objective(s)						
17.4.1	Recovery time objective(s) (e.g. within two hours)	Quarterly	Time	Within 2 Hours	Within 2 Hours	Within 2 Hours

FICC Risk Management Technology Capabilities

Operational Excellence 2Q Disclosures

Disclosure Reference	Disclosure Description	Frequency	Data Type	FICC		
				GSD	MBSD	
Disclosure 23.1 – Disclosure of rules, key procedures, and market data; Average Daily Volumes						
23.11	Average Daily Volumes by Asset Class, CCY and OTC/ETD	OTC	Quarterly		395,217	14,262
23.12	Average Notional Value of trades cleared by Asset Class, CCY and OTC/ETD	OTC	Quarterly	USD \$MM	4,493,412	341,086

FICC DEFAULT LOSS WATERFALL



FICC Member Default Loss Allocation (Waterfall)

Points To Remember:

A Defaulting Member's Clearing Fund deposit is used to cover losses that may be incurred by FICC.

Member Default Loss Allocation Practice

Step 1: Defaulting Member's Clearing Fund

Step 2: Cross-Margining Resources Available
Step 3: Cross-Guaranty Funds Available

Step 4: Corporate Contribution – 50% of the FICC General Business Risk Capital Requirement

Step 5: Split for Tier 1 and Tier 2 Members

Step 5A: Tier 1 Members

Allocation is based on Tier 1 member's Average RFD/sum of Average RFDs of all Tier 1 members subject to loss allocation in the round.

Step 5B: Tier 2 Members

Allocated only to the extent that any Tier 2 members have outstanding positions with the defaulting member *and liquidation results on these bilateral positions reflect losses.*

SUBMIT YOUR QUESTIONS



Go to
pigeonhole.at

Enter passcode

FICCDAY2

DTCC

ADVANCING FINANCIAL MARKETS. TOGETHER.™