SIFMA Insights

Spotlight: DTCC's Important Role in US Capital Markets

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In May, SIFMA hosted its annual Operations Conference & Exhibition,[1] which included a panel of executives from The Depository Trust & Clearing Corporation (DTCC). Inside this note we recap DTCC's important role in U.S. capital markets and how this firm is assessing and utilizing fintech capabilities.

The History of DTCC

By 1968, equity average daily trading volume (ADV) reached over 12 million shares per day. With no computerized trading or electronic centralized stock delivery system, financial institution's back offices were overrun with paper (they actually delivered paper stock certificates by hand!). The Paperwork Crisis forced the New York Stock Exchange (NYSE, a subsidiary of Intercontinental Exchange/ICE) to restrict trading to four days a week, as the exchange shut down on Wednesdays (and often closed early other days) to work through the backlog of paper. Despite this, the surge of fails (failure to receive or deliver securities within five days of a trade) continued, and firms lost control of records in the confusion.

Enter DTCC, a holding company providing post trade market infrastructure to advance automation, centralization, standardization and streamlining of processes. Its mission was to increase transparency and efficiencies, as well as decrease transaction costs. (The use of computers also helped ease the paper crisis and drove down transaction costs.)

Critical Market Infrastructure: DTCC plays a critical role in the efficient functioning of U.S. capital markets. It holds dominant, embedded positions in clearing and settlement operations, including clearing and settlement operations through its subsidiaries: DTC is the sole U.S. (and a large global) central securities depository (CSD); NSCC is an SEC registered clearing agency clearing U.S. cash equity transactions occurring on the major exchanges and trading platforms; and FICC is a registered clearing agency clearing primary dealer transactions, essential to the Fed's enacting open market operations which are critical to U.S. monetary policy. As all three subsidiaries are key utilities for capital markets, they are designated as Systemically Important Financial Market Utilities (SIFMUs) under Title VIII of the Dodd-Frank Act, requiring enhanced regulatory scrutiny and adherence to the IOSCO Principles[2].

Mandates Keep Prices Above Costs: DTCC is a user-owned utility run to serve market needs, as its owners are also the end users of the services it provides (and shareholders of the company). It is managed to generate benefits to the owners by increasing operational efficiencies, streamlining back office processes, meeting new regulatory requirements and therefore reducing risks and lowering costs. Keeping trading costs low is also a regulatory focus, as it is a competitive advantage to the U.S. and keeps money flowing to its capital markets. The three core subsidiaries have rate-setting mechanisms ensuring prices at least cover costs (as approved by DTCC's board of directors and regulators). These operations, along with the non-core businesses, have a proven track record of delivering adequate returns, which assist in building capital reserves.

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[1] SIFMA Insights: Operations Conference & Exhibition Debrief at: https://www.sifma.org/resources/archive/research/sifma-insights-ops-debrief-2019/

[2] The IOSCO principles are global risk management, operational and liquidity standards for financial market infrastructures, i.e. payment systems, CSDs, securities settlement systems, central counterparties and trade repositories.

DTCC Subsidiaries

DTC	NSCC	FICC	Non-Core
• ***The Depository Trust Company*** • Est. 1973 • CSD & SEC-registered clearing agency • Settlement, asset & wealth management services (ex: book-entry changes to ownership of the securities) • Equities, corporate and municipal debt, etc.	• ***National Securities Clearing Corporation*** • Est. 1976 • CCP & SEC-registered clearing agency • Clearing, settlement, risk management & other services • Equities, corporate & municipal debt, ETFs & UITs	• ***Fixed Income Clearing Corporation*** • Est. 2003 • CCP & SEC-registered clearing agency • CCP services (automated real-time trade comparison, netting, clearance, settlement, trade confirmation, risk management & electronic pool notification) • Government Securities Division (GSD) • Mortgage-Backed Securities Division (MBSD)	• ***Institutional Trade Processing (ITP)***: End-to-end straight-through-processing solutions for PT ops (LEIs, SSIs, pre-trade, matching) • ***Data Services***: Referential & activity-based data sourced from DTCC's products • ***Global Trade Repository (GTR)***: OTC derivatives trade reporting solution • ***DTCC-Euroclear GlobalCollateral***: Automates collateral mgt lifecycle • ***Trade Information Warehouse***: record retention & asset servicing for credit derivatives

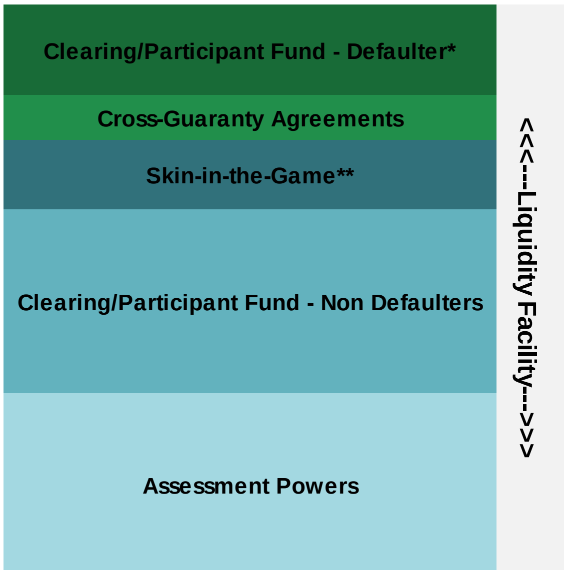
Note: UIT = unit investment trust; PT = post trade; OTC = over-the-counter; LEI = legal entity identifier; mgt = management. ITP formerly Omgeo.

Strong CCP/CSD Risk Management Operations: A main risk management focus of central counterparty clearing houses (CCP) and CSDs is ensuring resources and procedures will be sufficient to manage a member(s) default. As the buyer to every seller and seller to every buyer, a CCP must deliver the cash or securities due from a defaulted clearing member. The first line of defense is member access and monitoring. Rules for members are contractual obligations and can include, among others: maintaining sufficient capital, regulatory licenses and operational capabilities to handle trade processing and exchange of margin; meeting CCP/CSD compliance and reporting requirements; and making payments of membership fees and contributions to the clearing and/or participant funds. Should a member default on its obligations to the CCP/CSD, the CCP/CSD has contractual rights to stop clearing/settling for that member.

The second line of defense is the default management process, or the waterfall (each subsidiary maintains its own legally ring-fenced waterfall). The waterfall is composed of substantial pre-funded clearing/participant fund contributions[3] as the first-loss stage; DTCC can also require margin add-ons as necessary to mitigate member-specific exposures. Should a defaulting member's clearing/participant funds not be enough to cover losses, DTCC would move into the other layers of the waterfall to manage the default. DTCC has same member, cross-guarantee agreements between its three SIFMU subsidiaries and the Options Clearing Corporation – ex: if NSCC has extra collateral for a defaulting member after completing the defaulting member's close-out, FICC can use the excess to

[3] Margin or collateral in cash and low-risk securities like U.S. Treasuries; marked to market at least daily, if not on an intraday basis

cover shortfalls in its open exposures to the same defaulting member. If uncovered losses remain, the subsidiaries would apply a portion of their own capital (skin-in-the-game).



Note: *includes variation margin; **25% of retained earnings

If a loss remains after a subsidiary’s capital is applied, DTC/NSCC/FICC could access the non-defaulting members’ clearing/participant funds; the subsidiaries may also require non-defaulting members to contribute additional resources to their clearing/participant funds (assessment powers).[4] NSCC and DTC also have liquidity facilities to manage operational liquidity demands in the event of a member default.

Of note, neither subsidiary has ever had to tap the liquidity facilities, despite managing multiple defaults in DTCC's history.

DTCC’s Adoption of Fintech Capabilities – Securing Today, Shaping Tomorrow

As noted on the panel, DTCC tries to be at the forefront of fintech – including through its annual Fintech Symposium – while keeping the focus on clients first. The market has evolved and will continue to evolve, and DTCC believes market infrastructure should evolve as well. After the crisis, DTCC moved away from its at-cost model (rebating essentially all of profits to members, leaving little room to invest in innovation). This created a stronger balance sheet and enabled the firm to expand technology initiatives and deliver new capabilities to solve business challenges (capital optimization, risk reduction, expanding access, etc.). Fintech provides opportunities to not only decrease costs and increase productivity but also drive transformational client engagement and personalized service. DTCC is working on several initiatives to assess and leverage fintech capabilities, including:

Impacting Today – Robotic Process Automation (RPA)

- Billing – DTCC’s Finance Revenue Cycle team used to use two different legacy systems for billing, requiring end-of-month reconciliation. Given a lack of human capacity to reconcile each invoice, staff sampled 10% of the total to check overall reconciliation rates. By utilizing RPA, capacity constraints disappeared, and every single invoice is now reconciled. Staff were freed up to focus on analysis/solving cases that fail to reconcile, and clients benefit from more accurate invoicing.
- Onboarding – In an ongoing project, DTCC is working to automate some of GTR’s complex onboarding workflow (operates in multiple regulatory jurisdictions; 6,000+ client base). When a new client submits

[4] On balance sheet resources = clearing/participant funds (defaulter, non defaulters) and skin-in-the-game; contingent resources = assessment powers

onboarding forms, staff review the forms and move them into a Salesforce queue if the information is deemed valid. Then a bot processes the application and either funnels it into an exception handling queue (for non-standard or questionable data) or marks it successfully completed. The goal is to reduce the complexity and time of the onboarding process. However, even small changes in the other systems (ex: Salesforce) can cause the robotic process to fail. DTCC has, therefore, discovered that developing standards and utilizing an open-source model provides for structure as the bots are developed.

Transforming Tomorrow – Artificial Intelligence (AI) & Machine Learning (ML)

- Mutual Funds – In June 2017, DTCC implemented an automation initiative incorporating AI and ML to strategically enhance Mutual Fund Profile II, a central repository maintaining prospectus and operational processing rules for 27,000 mutual fund securities. By applying AI-driven enhancements, DTCC automated data sourcing and boosted the number of data points (minimum/maximum sales charges, underwriting fees, social codes, etc.) covered by the database to 5 million from 4 million, streamlining clients' collection and sharing of this data. The repository now captures higher-quality information with increased frequency and faster speed to market. If discrepancies arise as a fund updates its data points, the application automatically generates a notification prompting a data review and prevents the system from being updated with incomplete information.

Shaping the Long-Term – Distributed Ledger Technology (DLT)

- Post-Trade Infrastructure – DTCC continues to test DLT applications, yet the technology needs to be proven to be considered enterprise-ready or widely adopted by the industry. In other words, the technology is still evolving. As DTCC experiments, it continues to develop its internal capabilities with the technology to drive advancements in post trade processing for the industry. Moving DLT's capabilities forward for real world financial transactions will take scalability, interoperability and governance.
- Trade Information Warehouse – DTCC is preparing to move its Trade Information Warehouse (TIW) from a traditional database to distributed ledger and leveraging cloud computing to enhance scalability, improve flexibility, optimize performance and reduce costs. Additionally, they are using this project as a means to test the technology's potential and its limitations.

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