

Stock Settlement and Clearance in the United States

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Introduction

Perhaps the most overlooked aspect of the stock market relates to clearance and settlement of trades. In today's U.S. capital markets, billions of shares of securities change hands every day. Brokers, banks, investment managers, fund managers, exchanges and many others play prominent roles in this daily drama. And all rely on the behind-the-scenes expertise of the subsidiaries that make up the Depository Trust & Clearing Corporation (DTCC), the world's largest financial post trade infrastructure organization. The author was unable to find any information about the clearance and settlement process in several leading textbooks in either investments (i.e., Gitman & Joehnk 2003) or financial institutions (i.e., Mishken, 2006). They are silent to the quadrillion dollars in securities that are transacted through the Depository Trust and Clearing Corporation (DTCC) in a single year. This report does not pretend to bring forth any new or unique findings. Instead, it attempts to inform members of the Academy of Finance regarding the DTCC's rich history of providing high-quality, reliable, and innovative services to the financial services industry.

DTCC was established in 1999 as a holding company for six subsidiary businesses – a depository and five clearing corporations – as well as a global joint venture with Thomson Financial (called Omega). DTCC is owned by its principal users, including banks, broker/dealers and other companies within the financial services industry, including the National Association Securities Dealers (NASD) and the New York Stock Exchange. Overseeing the company is a 21-member board of directors. DTCC has operating facilities in multiple locations in the United States and overseas. In 2004, the securities settled through DTCC passed the \$1.0quadrillion level – equivalent to 7 times the genes found in the current world population.

The Depository Trust Company (DTC), which is one of the DTCC's primary divisions, is a member of the U.S. Federal Reserve System, a limited-purpose trust company under New York State banking law and a registered clearing agency with the Securities and Exchange Commission. DTC's participants are required to maintain deposits related to their activities in the depository. The deposits, which are all in cash, totaled \$872 million on December 31, 2005. The deposits are available to secure participants' obligations and certain liabilities of DTC. Deposits are invested in overnight reverse repurchase agreements, with the earnings passed on to participants. In 2005, such earnings totaled \$27 million, a 3.1 percent rate of return.

DTCC ensures the capacity, certainty and reliability required to clear and settle today's enormous trading volumes. Clearance and settlement is a process, which, at the end of the day, ensures that sellers are paid for the securities they sold, and buyers

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receive the securities they bought. How this process works is not always easily understood. The author's objective is to shed some light on this activity, provide a historical backdrop for how capital markets operate today, and discuss some of the more vexing issues in the securities clearance industry. This report was based on the DTCC's Annual reports, web site, and other public information about the institution.

In order to put the DTCC in perspective, the next section will discuss the evolution of the DTCC. The current clearing process will then be described. Finally, there is an analysis of the DTCC's management of short selling transactions, probably the issue that has caused the most criticism to be waged against the DTCC.

Evolution of the DTC and NSCC

DTCC Forerunners and the Early Years of the DTC and NSCC

The Depository Trust Corporation (DTC) and National Securities Clearing Corporation (NSCC) were both established in response to the paperwork crisis in the securities industry that developed in the late 1960s. At that time, brokers still exchanged physical certificates and checks for each trade, while hundreds of messengers scurried through Wall Street clutching bags of checks and securities. With the NYSE handling 10 to 12 million shares daily, brokers were literally buried in paperwork and concern about risk was growing. The crisis was so severe that, in order to help reduce the backlog, the exchanges closed every Wednesday and shortened trading hours on the other days.

Two separate and distinct approaches were developed by the industry to solve the paperwork problem. The first was to maintain (or immobilize) the physical certificates for stocks in a central location, and to record changes of ownership using "book-entry" (where no certificates change hands) accounting records. The NYSE established the Central Certificate Service (CCS) on a limited basis in 1968 to keep track of the total number of shares held and transferred by broker-dealers who were NYSE members. CCS would not have been successful, however, unless banks participated. That spurred the formation of the Banking and Securities Industry Committee (BASIC) to investigate this and other issues and to recommend solutions. BASIC's work led to the creation of The Depository Trust Company (DTC), a limited-purpose trust company that would immobilize securities for broker-dealers and banks, complete the book-entry delivery of those securities, and handle the myriad operational tasks required to provide centralized, automated processing. In 1973 DTC assumed the operations of CCS and focused on custodial services for banks, brokers and other institutions. DTC also began providing centralized post-trade processing of institutional trades to further streamline this activity.

The second approach to solving the paperwork crisis is called multilateral netting. One way of illustrating this concept is, if a broker bought 100 shares from one broker and sold 100 shares to that same broker later on, the two trades would be netted, and the net change would be no movement of shares between brokers (although brokers would have to account for the price differences). The problem with this was that brokers traded a single security with many different brokers during a trading day, and, as a result, there were few chances to net trades. Yet, if all brokers were required to clear and settle with a central clearance and settlement organization, all

trades in a single security could be netted to one obligation daily. These trading obligations could then be further reduced across all securities traded by a firm in a given day to net - or reduce - them to one settlement obligation daily. Instead of hundreds or thousands of checks being written, a single net money figure could be computed and paid to or received from the central clearance and settlement organization for an entire day's trading.

At first, the NYSE, American Stock Exchange and NASD all had their own clearing corporations to settle trades that took place in their markets. In 1976 they were merged into a new organization: National Securities Clearing Corporation. Over time, the regional exchanges eliminated their clearance and settlement organizations, and their functions were assumed by NSCC.

The benefits were immediate. With netting, movements in a security were reduced to a minimum each day, and the changes in ownership could be sent to DTC. With net money settlement, only a single money transfer was required. And with net settlement, the dollar amount of the financial obligations is now reduced by 95 percent.

In addition to the formation of the DTCC, several key events happened within the individual organizations during the formative 1970s decade. Both organizations introduced key technological advances that greatly reduced the number of failed trades by electronically linking broker-dealers, investment managers and custodian banks. Customers were provided direct access to DTC's computer system, automating an average of 90,000 paper transactions per day. In 1979, NSCC completed the consolidation of the clearance and settlement functions of listed and over-the-counter transactions, saving customers \$11.8 million that year.

The 1980s and 1990s

During the 1980s, DTC and NSCC extended the numbers and types of securities eligible for their services and introduced several new services. DTC unveiled its municipal bond program, Book-Entry-Only program, and same-day funds settlement (SDFS) - which allowed securities settling in same-day funds to become eligible for custody and book-entry. In a significant move to reduce marketplace risk, NSCC moved up its guarantee of matched trades to T+1 from T+4.

Responding to an urgent industry need to automate manually intensive processing, NSCC expanded to provide a full range of services for mutual funds, through its new Fund/SERV division. Networking gave funds and brokers an electronic link for updating information at the individual client level. It also introduced automated trade comparison and netting to the muni bond market, and its Automated Customer Account Transfer Service became a groundbreaking service for electronically transferring customer accounts between brokers.

DTC began offering services to the international market, with links that extended to Canada, Japan and Singapore, while NSCC forged a clearing link with the Canadian Depository for Securities Limited for Canadian firms trading U.S. securities. A subsidiary, International Securities Clearing Corporation (ISCC) was also established to streamline the process for U.S. brokers trading in overseas markets.

Growing trade volumes and concerns about risk led to an industry drive to shorten settlement cycles. NSCC and DTC led a successful partnership with industry trade groups, customers and regulators to convert from T+5 to T+3 settlement cycles in 1995 and began settling all securities transactions in same day funds in 1996. DTC also added options to its system for same-day trade confirmations, affirmations and settlement instructions.

NSCC continued its expansion into new markets with the introduction of its Insurance Processing Service (IPS), for insurance carriers and their distribution channels. Coming at a time of great investment demand for insurance products, IPS automated numerous critical steps to processing annuities and life insurance instruments. In 1998 NSCC also helped launch the Emerging Markets Clearing Corporation to clear and settle emerging market debt instruments. IT also began post-trade processing in the mortgage-backed securities market.

DTCC was established in 1999 as a holding company to bring together and integrate the operations of the Depository Trust Company (DTC) and National Securities Clearing Corporation (NSCC). The DTCC's purpose is to help grow the world economy by furthering the development of low-cost, efficient capital.

The Clearing Process Today

In the 21st century, the basic act of clearing still involves matching buys and sells. Once the transactions are executed on the exchange, details of the trades are sent to a subsidiary of the Deposit Trust and Clearing Corporation (DTCC), and are subsequently recorded and matched for accuracy. After all the trades sent by member firms to the DTCC are matched for buys and sells, the DTCC then notifies all member firms of their associated obligations, and arranges the transfer of appropriate funds and securities. Thus, rather than having individual brokers dealing with one another after every trade on a securities exchange, the DTCC acts as middleman collecting all transactions and streamlining the transfer of stocks and cash. This reduces the amount of time required for delivery and receipt of obligations and provides flexibility for brokerages in choosing dealing partners. This entire clearing process usually takes three days to complete. It is important to note that the DTCC not only facilitates but also guarantees delivery. If one party fails to deliver the securities or cash to the other, the DTCC will step in and fulfill the obligations of the failing party.

Depository Trust Company

In 2006, the Depository Trust & Clearing Corporation (DTCC), through its subsidiaries, provides clearance, settlement and information services for equities, corporate and municipal bonds, government and mortgage-backed securities, over-the-counter credit derivatives and emerging market debt trades. DTCC's depository also provides custody and asset servicing for more than two million securities issues from the United States and 100 other countries and territories. In addition, DTCC is a leading processor of mutual funds and insurance transactions, linking funds and carriers with their distribution networks. DTCC has operating facilities in multiple locations in the United States and overseas. The institution is truly incredible.

The depository brings efficiency to the securities industry by retaining custody of some 2 million securities issues, effectively “dematerializing” most of them so that they exist only as electronic files rather than as countless pieces of paper. The depository also provides the services necessary for the maintenance of the securities it has in custody.

National Securities Clearing Corporation

The other primary division of the DTCC is the National Securities Clearing Corporation (NSCC), which is the oldest and, in terms of the transaction volumes it processes, by far the largest of the clearing corporations. NSCC provides clearing and settlement, risk management, central counterparty services and a guarantee of completion for trades involving equities, corporate and municipal debt, money market instruments, American depository receipts, exchange-traded funds, unit investment trusts, mutual funds, insurance products and other securities. NSCC also nets trades and payments among its participants, reducing the volume of securities and payments that need to be exchanged by an average of 97% each day. NSCC generally clears and settles trades on a T+3 basis.

When two firms trade, they are considered “contra-parties” to each other. In a multilateral netting environment, NSCC steps into the middle of a trade, becomes the contra-party to both firms and guarantees completion of the transaction. This guarantee assures all members that NSCC will complete trades on the original terms, even if the original contra-party fails between midnight of trade date+1 and settlement. To protect itself and its members, NSCC requires members to post collateral (usually cash and securities) to cover the risks associated with the trade.

NSCC offers further protection from risk through a risk management system that monitors customers' financial health and trading patterns, as well as financial and operations requirements that applicants must meet in order to become NSCC members. In addition, NSCC ensures that it always has the capacity to process not only the average daily trading volume, but unexpected peak volumes, as well. This commitment has become increasingly important in light of the substantial volume growth observed in the 1990s.

Other DTCC Subsidiaries

The Fixed Income Clearing Corporation (FICC), which began operations on January 1, 2003, is DTCC's newest clearing corporation. FICC was formed by the merger of the Government Securities Clearing Corporation and the MBS Clearing Corporation. The former clears, settles and nets a broad range of U.S. Government securities transactions for its 104 member firms (brokers, dealers, banks and other financial institutions) and more than 400 correspondent firms that clear through these members. DTCC Deriv/SERV LLC provides automated matching and confirmation for over-the-counter derivatives (including swap, equity, and interest rate derivatives). Omgeo LLC, a joint venture with Thomson Financial, is a means to manage international, post-trade, pre-settlement reports. Omgeo acts as a communications hub for the exchange of information among key parties to an institutional trade.

The Cost Basis Reporting Service (CBRS) is an automated system that provides brokerage firms, banks and other financial organizations the ability to transfer customer cost basis information from one firm to another on any asset transferred through the Automated Customer Account Transfer Service (ACATS). The NSCC is also involved in the creation and processing of Exchange Traded Funds through Custom Index Shares Division.

Collateralization controls and net debit caps are employed by DTC to protect participants against the inability of one or more participants to pay for their settlement obligations. Through the DTC's Underwriting Service, underwriters can distribute both primary and secondary offerings of securities quickly and economically via electronic book-entry delivery and settlement. Fund/SERV is the industry standard for processing and settling of investment funds, including both 1940 Act and other pooled investment products for investment companies, money managers and financial intermediaries. Fund/SERV's Defined Contribution Clearance & Settlement (DCC&S) is a service package that facilitates the automated processing and reporting of defined contribution transactions [including 401(k), 403(b), and other defined contribution retirement plans] among asset managers, plan trustees, and plan administrators, including third-party administrators. Meanwhile, the Mutual Fund Profile Service provides participants with up-to-date information on mutual funds and fund members, individual securities, processing capabilities, and projected and actual distribution information.

DTCC responded to the growth in the annuity market by introducing Insurance Services, which created a suite of services that streamline the sale, servicing, and back office processing of fixed and variable annuities and life insurance. This automated, centralized and standardized infrastructure enables insurance carriers and distributors to exchange information at various points throughout the annuity and life insurance processing cycle. Insurance Services is now connected to more than 100 distributors and 50 insurance carriers, representing more than 100 subsidiaries.

Naked Short Selling, Regulation SHO, and the DTCC

One of the more vexing issues facing the DTCC according to Finnerty (2005) is that of naked short selling. In 2003, the U.S. Securities and Exchange Commission amended Regulation SHO, which requires short sellers in equity securities to locate securities to borrow before selling short. In addition to pitting market makers against public companies, it called into question DTCC's electronic settlement system. In the normal course of business DTCC tolerates so-called failed-to-deliver entries of shares offered for sale. This means the seller does not have the certificates on hand but promises to make good on them eventually. According to the Avery and Koh (2005), DTCC asserts that the failure to deliver problem is small, being only \$6 billion daily out of \$400 billion-worth of transactions, and some of these were simple mistakes such as "sale of certificates that were later found to have been lost or stolen." O'Brian (forthcoming) reports that billions may have been lost when uncovered naked shares were sold, and market makers (and/or their clients) took profits, after waiting to buy back the shares.

The potential impact of naked short selling is so important that Smith (2005) has written a primer designed to help CEOs avoid being blindsided by naked short selling. According to him simply uttering the words "naked shorting" will cause an investor sell-off and should be

avoided at all costs. There are concerns whether the DTCC could be assisting market makers in this activity. Some firms and investors (for example, Nanopierce Technologies, Seitz, and Seitz v. DTCC, 4/29/2004) have taken DTCC to court over the issue of naked short selling. In November 2005, Overstock.com President, Dr. Patrick Byrne, alleged that short sellers had targeted his company on CNBC and Fox with Neil Cavuto and in court (Catino, 2005).

In January 2005, the SEC required all exchanges to comply with a new Regulation SHO. Regulation SHO requires these exchanges to provide a daily listing of shares that failed to deliver over 10,000 shares or 0.5% of the issuer's total shares. Reg SHO requires a broker-dealer to close out any "open fail" positions that have been on this list for thirteen consecutive days. However, that allows shorts to buy back stocks after they have had two weeks to drive down prices --and make a profit. To the extent that the DTCC facilitates these activities it could be called on to make restitution to investors.

Summary

Capital markets would be less efficient without the existence of the Depository Trust and Clearance Corporation (DTCC), if they existed at all. This report sheds light on the Depository Trust and Clearance Corporation, and its two main components the Depository Trust Corporation (DTC) and the National Security Clearing Corporation (NSCC). It is the job of the two organizations to provide an efficient and safe way for the buyer and seller to exchange securities and money, thus "clearing and settling" the transaction. Broker-to-broker trades are processed by National Securities Clearing Corporation (NSCC), which handles post-trade processing for virtually all equity, municipal and corporate bond transactions in the U.S. market. DTCC also provides clearance and settlement for institutional trades by mutual funds, pension funds, hedge funds, bank trust departments, and insurance companies.

At the end of 2005, the DTC held 2,644,000 securities in its vaults, with a value of \$31.2 trillion. During that year, the NSCC processed 6.6 billion transactions. In addition, the Fixed Income Clearing Corporation processed over \$870 trillion in transactions. All of these values were at least twenty percent higher than they were in 2004.

We face a future in which capital will be flowing increasingly across national borders, and where financial firms will be further consolidating and offering a growing array of products and services. It is a future in which technology will be driving -- with greater force -- new ways of doing business, where the time it takes to settle trades will be reduced to minimize risk and where trading volumes will continue to escalate almost exponentially. This report has shed light on the Depository Trust and Clearing Corporation, a key but often misunderstood (if not totally disregarded) cog in the U.S. financial system.

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