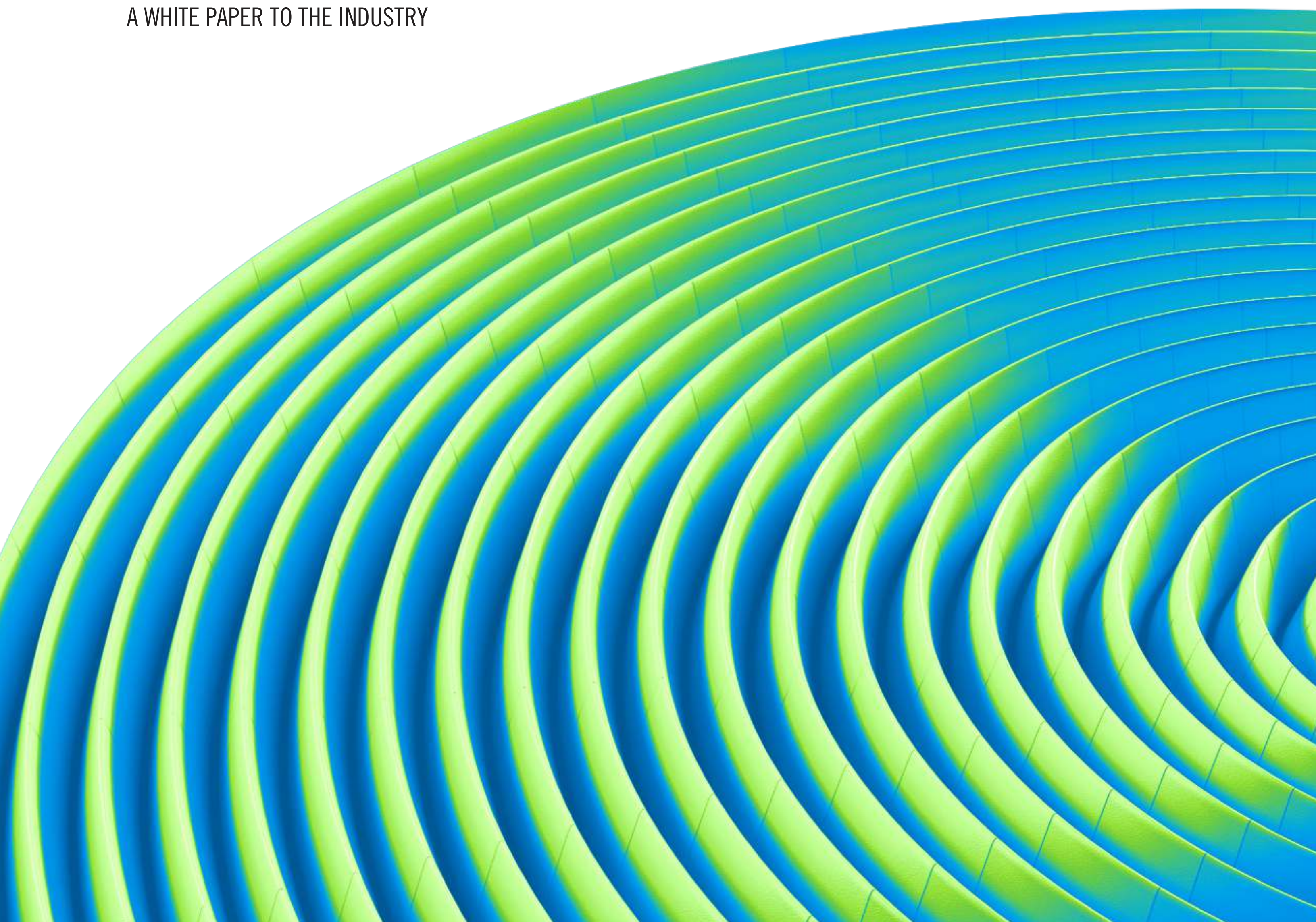
SEPT 2020

FROM PHYSICAL TO DIGITAL
ADVANCING THE DEMATERIALIZATION OF U.S. SECURITIES

A WHITE PAPER TO THE INDUSTRY



Dear Colleagues and Stakeholders,

Resilience is a term often used to describe the ability to respond to adversity, and DTCC has long-considered resilience an integral part of our values and guiding principles. We are proud of how the industry has demonstrated extreme resilience and agility throughout the extraordinary events of the past several months, managing unprecedented market volatility and transaction volumes.

Without question, however, supporting physical securities – a very small piece of the industry's business – has been a distraction from an otherwise very resilient response to the Covid-19 pandemic. Today, the industry has reached an inflection point, highlighting the compelling need to move forward to full dematerialization. The costs and risks incurred by processing physical securities are no longer acceptable.

DTCC has outlined a roadmap toward dematerialization. We are now embarking on building consensus among the stakeholders on critical next steps and engagement, much in the way the industry worked together cooperatively to successfully implement T+2 settlement in 2017.

Without question, there are operational hurdles within this area of the industry, including issues related to business models, record-keeping, inventory, resilience and controls. However, the complete dematerialization of physical securities, fully transitioning away from paper to electronic records, will contribute to a more cost-effective, efficient, transparent, secure, competitive – and above all, resilient – marketplace for all.

The world of online – not only cashless but contactless – commerce has accelerated and has forever reshaped every aspect of consumer behavior. Physical securities processing is no different, and it is well past the time we, as an industry, should all agree to move forward together toward a better solution.

Murray Pozmanter

Head of Clearing Agency Services and Global Business Operations, DTCC

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EXECUTIVE SUMMARY

The Covid-19 pandemic of 2020 has highlighted the need for continuity and resiliency in the securities market, including the post-trade lifecycle. The intention of this paper is to mobilize the industry to aggressively streamline one aspect of the post-trade lifecycle – the servicing and processes of physical securities.

Through the dematerialization of physical securities, the industry can significantly reduce touchpoints and automate processes.

There has been a long-standing movement to achieve full dematerialization in the U.S. financial markets and to finally transition away from physical certificates to electronic records. In fact, those outside of the immediate industry might not realize that while firms today are investing hundreds of millions of dollars into modernizing processing systems – enhancing electronic trading technology to shave milliseconds from trades and exploring cutting-edge fintech innovations like distributed ledger technology, and digital and tokenized securities – physical securities processing still exists.

The management and processing of physical securities are industrywide challenges. Yet there is strong precedent for the success of dematerialization. Dozens of countries across Europe, Asia-Pacific, Africa and Latin America have stopped issuing physical certificates altogether. Currently, most U.S. securities, including municipal and corporate bonds, U.S. government and mortgage-backed securities, commercial paper and mutual funds are offered only in paperless form. Certain asset classes, such as listed and unlisted equities, have largely achieved dematerialization through the Fast Automated Securities Transfer Program (FAST)[1] and Direct Registration System (DRS)[2]. However, even in the current state of dematerialization, it is often still possible to obtain certificates – which continues to result in multiple handling touchpoints between beneficial owners and financial intermediaries and to pose risks associated with physical securities processing.

INDUSTRY CRISIS: COVID-19 AND PHYSICAL SECURITIES PROCESSING

While DTCC operated seamlessly throughout March and April 2020, managing record-breaking volumes and unprecedented market volatility, COVID-19 did disrupt one area of business: physical securities processing.

Throughout this time, industry stakeholders who worked with physical securities or in physical processing across the industry were unable to be on premises to handle certificates, stamp and sign documents, receive checks and process paper.

With little to no access to vaults and/or with limited personnel, DTCC and the industry had to look for alternatives and creative workarounds.

When the pandemic hit, DTCC implemented various complex processes and regularly communicated these stop-gap solutions to industry participants. These workaround solutions were inconvenient, but necessary, to allow for limited processing with an elongated cycle.

[1] The Fast Automated Securities Transfer (FAST) program minimizes and streamlines certificate movements between DTC and transfer agents by the maintenance of a single balance certificate registered to DTC (in its nominee name, Cede & Co.) of a security by the transfer agent, as custodian for DTC. The transfer agent also records the securities ownership of DTC in book-entry form on the books and records of the transfer agent. This reduces the costs and risks associated with the creation, movement, and storage of certificates, including, but not limited to, costs of insuring, handling and shipping physical certificates, and the risks associated with lost or damaged certificates.

[2] The Direct Registration System (DRS) allows registered owners to hold shares of a security on the records of the transfer agent in book-entry form rather than in certificate form. Ownership is reflected on the books and records of the transfer agent, as well as by the DRS statements provided by the transfer agent to the owner. DRS leverages DTC's connectivity with DRS/FAST transfer agents. Through the DRS service, assets can be electronically transferred to and from the transfer agent and broker/dealer to easily move shares in and out of DRS.

With this paper, DTCC and its depository subsidiary, The Depository Trust Company (DTC), seek the partnership and participation of all industry stakeholders, including banks, brokers/dealers, transfer agents, issuers, regulators, industry associations, and exchanges, in the effort to achieve full dematerialization in the U.S. financial markets. We need to form active working groups and collaborate to set aggressive,- but realistic, goals and a timeline.

Together, we will forge a plan to achieve the following goals within the next three to four years:

- Eliminate new issuances of securities in physical form;
- Establish a streamlined process for the conversion of existing physical securities to electronic form;
- Promote DTCC's FAST Program by supporting the conversions of non-FAST agents to FAST in order to transition away from high-touch processing;
- Incentivize participation in DRS;
- Deliver low-touch processing of restricted equities securities.

The success of this plan will require strong support from industry organizations. It will also require a full-scale and committed adoption by stakeholders of new business practices, changes in technology platforms, and shifts in the legal landscape. And it will require support from regulators. The benefit of achieving complete dematerialization – reducing and ultimately eliminating paper – will lead to a significantly more efficient and resilient U.S. marketplace.

DEMATERIALIZATION TODAY

For several years, the processing of physical securities has lagged behind the efficiency and resiliency of servicing dematerialized securities and has posed myriad challenges for the industry and for the investing public.

While the crushing mountain of paper of the paperwork crisis in the 1960s and 1970s was addressed by the two-pronged approach of immobilization and dematerialization, there continues to be certain risks associated with physical securities, such as delays in issuing or delivering physical certificates, as well as disruption from loss, theft, and natural disasters.

SCOPE, SIZE AND DIMENSION OF THE CHALLENGE

Physical securities have not been a growth area for the securities industry for many years.

Over time, the economies of scale for physical securities processing have been completely reversed: the costs incurred in supporting physical certificate processing remain fixed, even though the number of physical transactions is dwindling. Right now, the amount of effort required to support physical securities processing is significantly disproportionate to its actual value.

STAKEHOLDERS

As with each past crisis or market downturn, re-examining industry practices and processes can lead to opportunities to improve the performance of the industry and businesses.

Dematerialization is a complex industry issue that will require collaboration and consensus among all industry stakeholders to forge a realistic plan, set achievable goals, and determine a timeframe for the adoption of dematerialization proposals.

DTCC, banks, brokers/dealers, transfer agents, issuers, and industry associations, among others, each have their own roles and responsibilities for the success of the dematerialization plan. Finally, in order to achieve success, it is critical that the industry has the support of regulators.

INDUSTRY CRISIS: A SOARING VOLUME OF PAPERWORK

In the late 1960s, Wall Street had a paper problem. By 1967, trading averaged 10 million shares per day. Three months later, that number had doubled to 20 million shares per day.

The soaring volume buried workers in paper and resulted in hundreds of thousands of transactions remaining unsettled every day. The exchanges had to cease trading on Wednesdays, shorten trading hours on other days, and extend settlement by a day to T+5 just to give a reprieve to catch up on the backlog of paper.

The industry's solution was to pool securities in a single location – immobilization in the vaults of depositories such as the newly-created DTC – followed by substituting physical certificates with electronic records of "book-entry" securities on the books of the depository, a process known as dematerialization.

DEMATERIALIZATION GOALS

CEASE CREATING NEW CERTIFICATES

The first step toward full dematerialization is to eliminate the creation of any new issues in physical form. This will require the engagement and partnership of the industry, particularly, issuers, agents, and trustees.

In terms of equity securities, all exchange-listed issues are required to have a FAST Agent that is also a DTC DRS Limited Participant, who, in conjunction with DTC, provides access to the Direct Registration System (DRS). In order to be DRS eligible, the issuer must be authorized to issue the security in book-entry form under its corporate governing documents. DRS provides for an individual investor to have its shares registered in its name directly on the books of the issuer/transfer agent. The investor's ownership of the shares is reflected in a DRS statement that is provided by the transfer agent to the investor.

In addition, an investor, through a DTC Participant, can request that its beneficially owned securities be withdrawn electronically from DTC and be registered in the investor's name directly on the books of the transfer agent. The investor, through a DTC Participant, can also request that its shares be transferred from the books of the transfer agent to the account of its securities intermediary at DTC, at which point the securities will be credited to Cede & Co. on the books of the transfer agent

Currently a security that is DRS eligible is not required to participate in DRS. If an issuer wishes to participate in the DRS program, it can choose between two options:

1. DRS Participating/DRS Statement or Certificate Form –The security is not fully uncertificated. By default, a holder will receive a DRS statement of its ownership of shares from the transfer agent. However, the holder could also obtain a certificate from the transfer agent upon request.

2. DRS Participating/DRS Statement Only form – The security is fully uncertificated. A holder can only receive a DRS statement and cannot obtain a certificate from the transfer agent.

To cease the creation of new physical certificates, exchanges should continue their efforts to amend their listing requirements to mandate DRS Statement Only form for all newly listed issues. This will be a critical step toward full dematerialization of new equity issuances. DTCC is fully supportive of further collaboration with issuers and transfer agents to encourage existing issuing companies to no longer offer certificates. In terms of debt issuances, there are already dematerialization initiatives being implemented or discussed, including e-CDs and uncertificated corporate debt. These initiatives, as well as further expansion of uncertificated debt issuances, will also require collaboration and cooperation among industry stakeholders.

AUTOMATE HIGH TOUCH PROCESSES THROUGH FAST

The FAST program minimizes the movement of physical securities between DTC and transfer agents by reducing the number of physical certificates that need to be cancelled, re-registered, deposited, or withdrawn.

The FAST program eliminates recordkeeping redundancies and manual processing, facilitates the industry's dematerialization efforts, and plays a

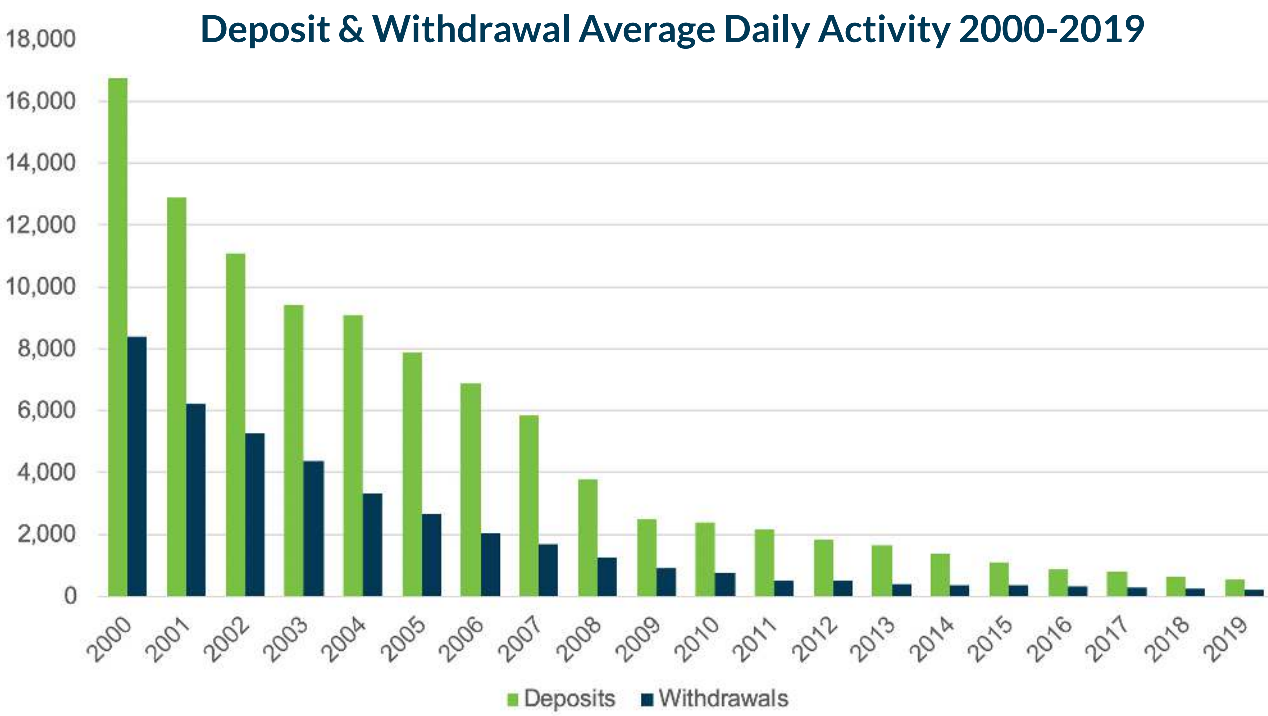
NOTHING IS FASTER THAN FAST

With FAST, transfer agents currently maintain a jumbo balance certificate — one for each issue — registered in the depository's nominee name, Cede & Co. Balances are automatically adjusted each day based on deposit and withdrawal activity at DTCC, and FAST transfer agents electronically confirm balances daily. A transfer agent for a DRS-participating security that is listed on an exchange is not required to maintain a jumbo balance certificate for Cede & Co.

DTC is exploring ways to add more efficiencies to the FAST Program that could encourage greater participation by transfer agents and issuers.

significant role in reducing the costs associated with shipping certificates to and from agents, as well as the costs related to printing and processing certificates. FAST, introduced in 1975 with a few hundred issues and several agents, was critical to helping the industry reduce the number of physical certificates being created and moved between DTC and the transfer agent community.

Transfer agents play a central role in driving dematerialization and helping educate issuers and investors on the benefits of dematerialization. DTCC will work to promote the efficiencies of the FAST process, with the goal of converting all non-FAST processing to FAST. This is a critical step in dematerializing physical certificates and will position the transfer agent to support DRS for all equity issues. Today, there are over 135 FAST agents with over 1.2 million issues valued at over $60 trillion.



REDUCE EXISTING INVENTORY IN THE INDUSTRY'S VAULTS

To date, many millions of share certificates in the U.S. capital market have been dematerialized. With concerted effort and the help of the transfer agent community, DTCC believes a realistic target in the next three years would be the full dematerialization of 98%+ of all physical stock certificates.

A big step toward reducing the number of existing physical certificates held by industry participants is to convert non-FAST transfer agents to FAST agents, as mentioned above. However full dematerialization of equities will require full participation in DRS. i.e. DRS Statement Only. The conversion of existing physical inventory to DRS Statement Only will take collaboration among the issuers and their transfer agents, custodians, broker/dealers, exchanges, and regulators.

DTC currently only allows for the withdrawal of DRS participating issues in Statement Only form. However, certificates for DRS eligible issues that are not Statement Only may still be obtained at the issuer's transfer agent.

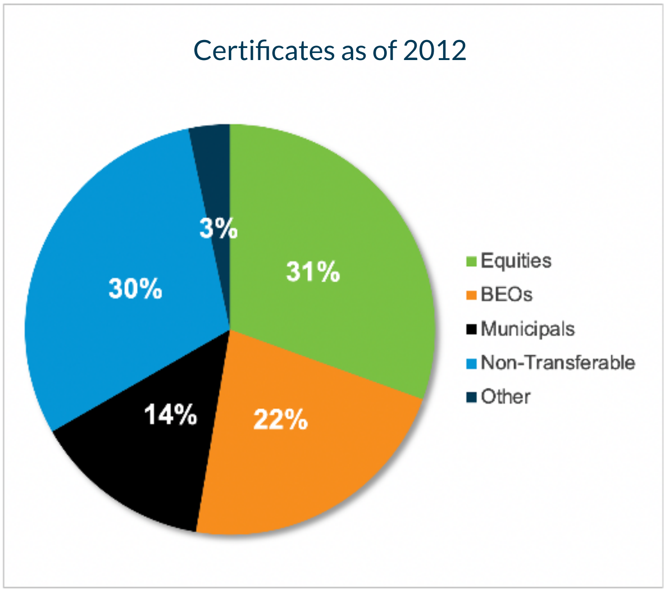
DTCC believe this practice is an obstacle to dematerialization and that ultimately, the only option for DRS should be DRS Statement Only form.

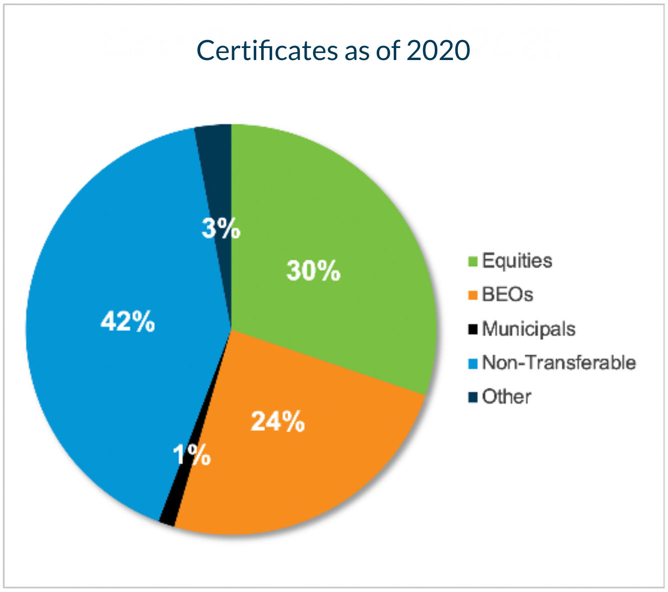
To move toward that goal, DTCC believes that now is the time to begin to minimize physical securities transactions of DRS issues that are not Statement Only. Specifically, DTC believes that holders should be discouraged from requesting physical certificates and should be encouraged to deposit physical certificates for a DRS participating issue with the transfer agent for conversion back to DRS, whereby they can be electronically deposited into DTC in the event of sale. DTCC and industry stakeholders must collaborate and set a target for a date by which DTC would no longer negotiate physical certificates for book-entry services.

DTCC recognizes that issuers may have chosen to make physical securities available for various business reasons. However, these issuers may not be aware of the cost benefits and efficiency that dematerialization offers. It is the responsibility of industry stakeholders, particularly transfer agents and underwriters, to educate these issuers and address concerns.

Cede & Co. Vault Inventory as of 2012 and 2020 by Asset Class

(reduction of 33%)





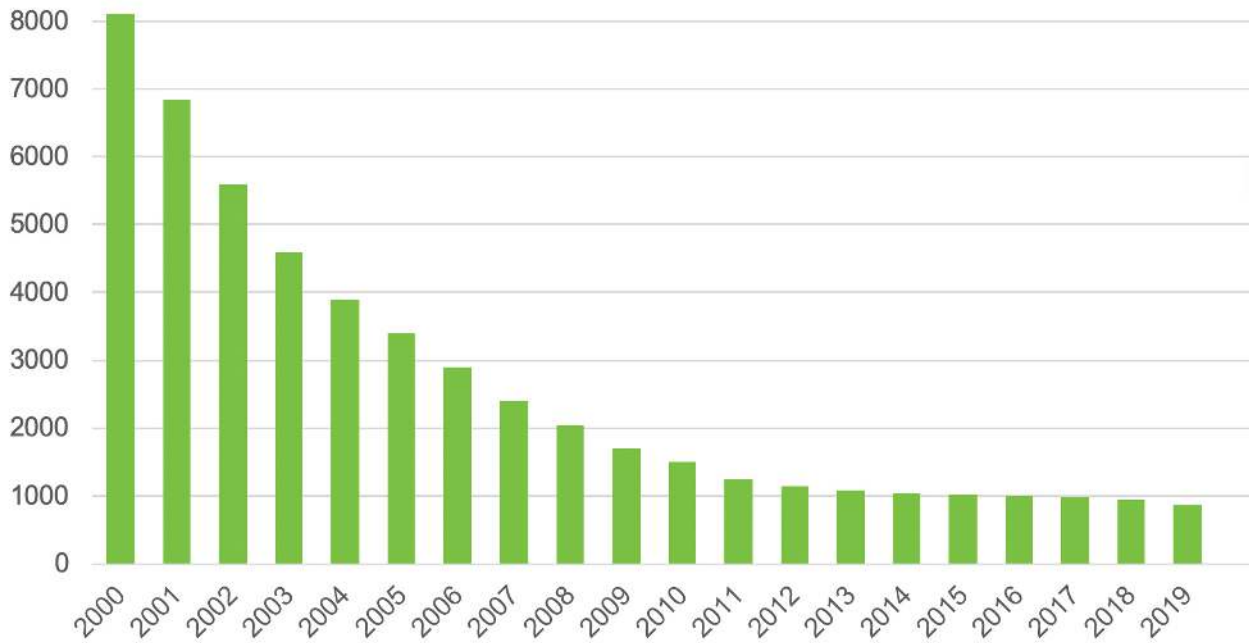
Asset Class	Certificates as of 2012	Issues	Certificates as of 2020	Issues	Variance	%
Equities	383,400	9,768	253,209	8,057	(130,191)	-34%
Book Entry Only (BEOs)	278,083	256,597	203,550	173,346	(74,533)	-27%
Municipals	176,430	11,166	10,722	2,092	(165,708)	-94%
Non-Transferable	376,986	16,161	346,593	12,759	(30,393)	-8%
Other	41,081	6,407	24,363	5,354	(16,718)	-41%
Total	1,255,980	300,099	838,437	201,608	(417,543)	-33%

WHAT REMAINS TO BE PHYSICALLY PROCESSED

We know there is a shrinking inventory of Cede & Co. physical certificates in the DTC vault; today, less than 1% of assets serviced by DTCC – valued at approximately $780 billion dollars – are still in physical form.

While there has been progress toward dematerialization, as evidenced by the decreasing volume of traditional physical certificates stored and processed in DTC's vault for book-entry services, there has not been meaningful traction in certain other areas. In particular, there has actually been an increase in the deposit of restricted securities into the DTC Custody Service. By utilizing the Custody Service, a client can benefit from, among other things, cost savings from the economies of scale offered by DTC, and the added efficiency of the limited depository services offered by DTC with respect to securities held in its Custody Service. Further industry collaboration is needed to address the asset classes held in DTC's Custody Service; restricted equities presents an optimal starting place to endeavor toward reducing these assets held.

Physical Certificate Cede Vault 2000-2019



The above describes the physical processing at DTCC, but it should be noted that the physical securities held in vaults of banks and firms across the industry must also be addressed. With the help of all stakeholders and the support of regulators, DTCC is optimistic that together the industry can eliminate much of the remaining physical inventory.

NEXT STEPS

The drive to fully dematerialize U.S. financial markets has lagged the rest of the industry's modernization during this era of unprecedented economic and technological growth. The goal of this dematerialization effort is to eliminate both the issuance and handling of physical securities, which will result in a more cost-effective, efficient, transparent, secure, competitive, and resilient marketplace.

1. **Form working groups and collaborate with industry organizations and regulators to set a timeline. With the support and participation of these industry working groups, the first step will be to determine dematerialization priorities based on complexity and impact.**

   Dematerialization is a complex industry issue that will require coordination and consensus among all stakeholders. The formation of working groups will help set the forum for partnering across stakeholders. Stakeholders will help to set priorities, build consensus, and set realistic targets for adoption. We must be united in this effort to eliminate all new issuance in physical form, and ultimately, convert existing inventory to dematerialized form.

2. **Automate high-touch processes by converting non-FAST agents to FAST.**

   - We must agree on a timeline for converting non-FAST agents to the FAST program. DTC suggests a 36-month (3 year) target to eliminate non-FAST transfer agent participation. This will require changing DTC rules, subject to regulatory approvals, to require a FAST relationship, affecting all existing certificates except non-transferable and bearer issues.
   - Coordinate activities to convert existing physical inventory in DTC's vault with non-FAST agents into FAST. We recognize this is not an insignificant effort: DTC currently has 188,849 issues presenting 491,844 certificates to convert to FAST.
   - Convert existing non-FAST certificates in DTC's vault to FAST.

3. **Continue to execute on DTCC's Underwriting (UW) Rewrite project.**

   To eliminate the need for physical certificates at the time of issuance, these proposals will pursue the modification of DTCC's new issuance eligibility process and recommend new business practices for the primary issuance of securities.

   - Continue to build out digital certificates for retail CDs, transforming paper into electronic records for this asset class. There are approximately 30,000 retail CD issuances per year that are issued in physical form. The roll-out of electronic CD issuances is scheduled for end of 2020.
   - Leverage the new issuance process to include an uncertificated distinction for debt issuance. Continue work with the STA Debt Committee to recognize this new form of issuance in the indenture of the issuance and modify DTC's issuance governing documentation for alignment with this new form of debt issuance.
   - Work with industry stakeholders to determine how best to transition away from the current physical municipal issuance process to uncertificated issuance.

4. **Require all newly listed equities to conform to DRS Statement Only and convert all existing equities to DRS Statement Only.**

   As a central depository, DTCC is in the middle of every depository eligible physical transaction between its clients and transfer agents, and from that position has identified all non-DRS Statement Only equities as the number one priority to address and convert to DRS Statement Only. DTCC Securities Processing team has estimated they spend almost 30% of their time processing DRS eligible physical deposits. To stop the creation and issuance of physical certificates for all new equity listings and to convert existing equities, DTCC recommends:

   - DTC should no longer negotiate certificates except through DRS Statement Only.
   - Continuing to work with exchanges to encourage rule filing and accelerate the process to amend listing rules requiring all new equity listings, including OTC and Pink Sheet Issuers, to conform to DRS Statement Only.
   - Work with transfer agents and Issuers to implement a mandatory conversion of all certificates issued to DRS Statement Only. DTC processes approximately 80,000 physical deposits on an annual basis. Converting to DRS Statement Only will reduce, and eventually eliminate, processing these deposits.
   - Determine a date whereby DTC will no longer accept physical deposit of DRS eligible issues, establishing the transfer agent as the sole recipient of certificates with further deposit to DTC in electronic form. DTC suggests January 2022 as the target, allowing time for firms to adjust to this new requirement and necessary rule amendments, subject to regulatory approval.

5. **Optimize processing of restricted securities to manage remaining inventory.**

   This workstream will require stakeholders to evaluate how the model for the issuance and custody of restricted shares can be made more efficient, and perhaps dematerialized.

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