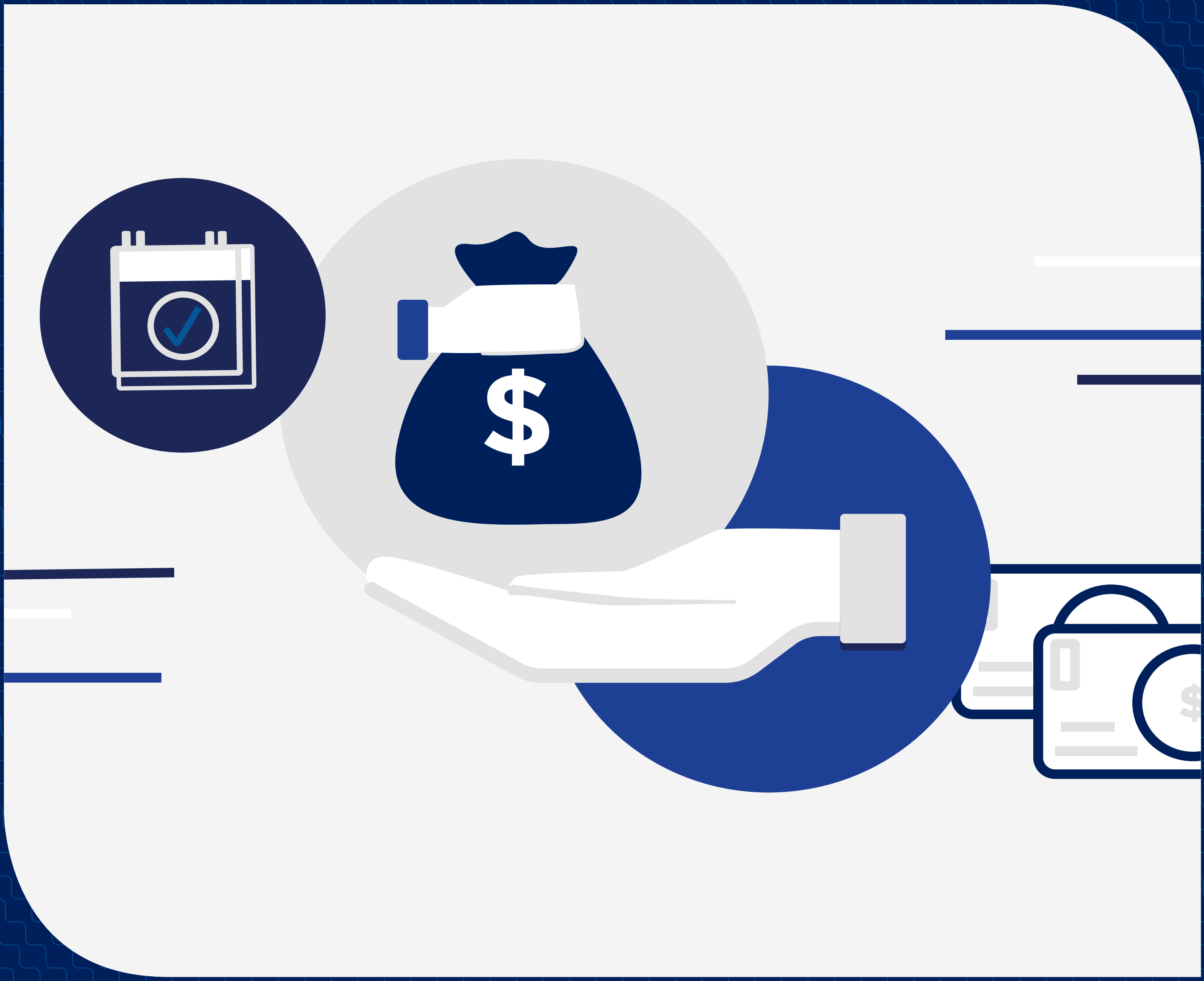


Settlements:
Then, Now and in the Future

Fifth Third
Institutional Services

Trade settlement has evolved over the centuries and is now poised to make improvements that will help financial market participants **settle trades faster, more reliably and with less risk.**

EXECUTIVE SUMMARY

Technology has transformed nearly every aspect of finance over the last decade, making it easier than ever to research and trade securities, manage risk, optimize returns, and more—all on a global scale.

Yet, a lot still happens behind the scenes to ensure transactions close successfully and accurately. Trade settlement—the point at which ownership of a security actually transfers from seller to buyer—is the final and critical hurdle in the process.

Over the last several decades, the trade settlement period has gradually shortened from seven days to two days, offering investors quicker access to funds, increased liquidity, and better portfolio visibility and risk management. Looking ahead, such advancements as advanced analytics, machine learning, blockchain and artificial intelligence could pave the way for real-time settlements.

In this white paper, Fifth Third looks at the how the security settlement process works, how and why it has evolved, what the current state of settlements means for institutional investors, and what improvements are underway to further speed the settlement period.

KEY POINTS:

- **Paper certificates are now obsolete and sold as collectibles.**
- **Technology has fueled ever-quicker securities settlements.**
- **Improved settlements translate to better liquidity, quicker access to funds, and less exposure finance and credit costs.**
- **Securities settlements are now T+2, or within two business days of the transaction.**
- **The evolution of settlements has been gradual to avert market disruption.**
- **With further improvements in technology and market adoption, the goal of T+0 for all securities is moving closer to reality.**

The Basics: What are Settlements?

A settlement is the date that ownership of a stock, bond, or other security transfers from seller to buyer. Given the growing complexity of financial markets, there is nothing simple about settlements, if only because of the sheer volume. In the United States alone, roughly 138 million shares of stock trade each day.

Today, when an investor buys a stock, the stock brokerage firm must receive the buyer's payment no later than two business days after the trade is executed. When a market participant sells a stock, shares of the stock must be delivered to her brokerage within two business days after the transaction.

Technology has improved the settlement process over time, but it's also created another problem: one of incongruity. Historically, many transactions were not settled until a physical certificate of ownership was transferred to the buyer.

Now, while the buyer's money will have already have been transferred into the seller's account through fast electronic means, the transaction remains incomplete until the stock and its conferred rights of ownership—such as voting rights and claim to dividends—are in the buyer's possession.

For this reason, custodians play a critical role in monitoring and settling these trades successfully. In addition to this vital role, custodians also are essential guards in OFAC and AML procedures providing additional safeguards to America's war on terror. **While most of the trade settlement process happens electronically, custodians help safeguard transactions,** whether by flagging fraudulent trades or quickly resolving issues that would otherwise end in a failed trade.

A Brief History of Settlements

To best appreciate the settlements process, it first helps to understand its progress.

The amount of time a security takes to settle is a matter of ongoing improvement over the course of history in the industry. In the 1700s, the first stock settlements took place over a fortnight between the Amsterdam Stock Exchange and the London Stock Exchange, where shares were cross-listed and traded. The settlement period accounted for the two weeks that a horseback rider and ship could reasonably make the trip to deliver the certificate of stock.

In America, meanwhile, the New York Stock Exchange formally began trading in 1817—and for the next 150 years, physical delivery was made by foot, ship, horse, train and plan. Trade settlement times varied greatly until 1968 when Wall Street was drowning in paper from a surge in trading, which caused the exchange to close often on Wednesdays to settle trades. The gap between the initial transaction and full settlement allowed for the time the postal service or New York couriers to deliver the stock certificate and funds.

As technology and communication improved in the 1970s and 1980s—particularly with the advent of fax machines and the founding of the Depository Trust & Clearing Corporation (DTCC) in 1973—settlement periods began to shrink from five days to three business days in 1993 (or T+3, which means trade date plus three days). T+3 settlement had been the standard for most securities trades since 1993.

By 2017, major financial markets had adopted T+2, a two-day settlement. If a transaction occurred on Monday, by law, it would have to be settled by the end of the Wednesday. Notably, in October 2014, Europe crossed the two-day threshold three years before the NYSE.

Settlements in the T+2 Era

Like earlier improvements to settlement periods, the requirement to settle trades in two days came with both fanfare and risk.

In March 2017, the Securities & Exchange Commission announced a shorter settlement period for securities transactions – a move designed to enhance efficiency and reduce risk, without jarring market participants with erratic changes. The SEC mandated that most broker-dealer securities would now be required to settle within two days after the transaction, or T+2, reducing the settlement period by one day.

The amended rule applied the T+2 settlement cycle to stocks, bonds, municipal securities, exchange-traded funds, certain mutual funds, and limited partnerships that trade on an exchange.

The United States markets were, at that time, the only major financial market still using the longer three-day settlement process; U.S. markets were lagging London and Germany and creating friction in global trading.

What was once a process of printing paper stock certificates and a "paper crunch" was now completely done through digital records either through brokerages (referred to as ***street name*** registration) or through the target investment company itself (referred to as ***direct*** registration).

Under street name registration, the security is registered in the name of the brokerage firm on the issuer's books, and that brokerage firm holds the security in ***book-entry*** form. Book-entry means investors are recorded electronically and do not receive a paper certificate.

With direct registration, the security is registered in the investor's name on the issuer's books, and either the company or its transfer agent holds the security in the investor's name in book-entry form. The ***direct registration system*** (also known as DRS) allows investors to transfer securities held this way. Regulators now require all major public companies be eligible to be in the system.

Meanwhile, machine-learning has dramatically changed the settlements process. This technology—which analyzes data to find patterns and improve on them—makes it possible for most trades to be settled through what's known as straight-through processing, whereby trades are executed, confirmed and settled without human input.

Even so, trades can and do fail—at which point they need to be settled manually. **Here is where custodians play an integral role in ensuring that legitimate trades go through as planned, while potentially inaccurate or fraudulent transactions are flagged for immediate review.**

The Next Frontier: T+0

Even while moving to a two-day settlement, the SEC and other industry groups have been preparing for the next step in shortening the settlement period to one day, or T+0, as government treasuries are now done.

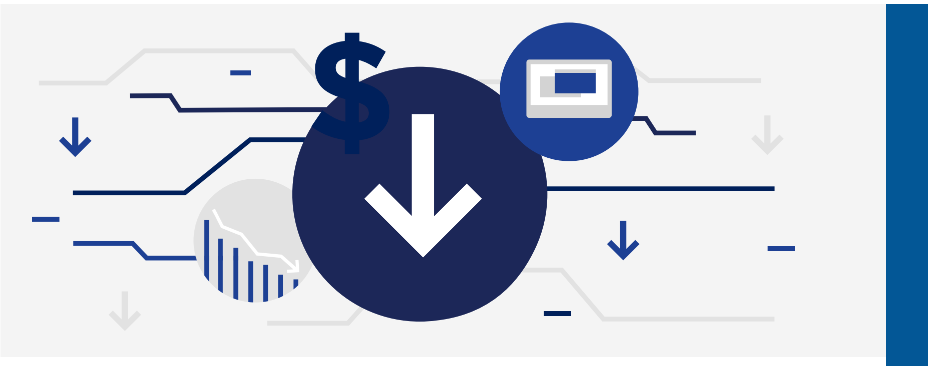
Emerging technologies, such as blockchain, have opened the door to a renewed push for quicker settlements. In 2016, the European Central Bank and the Bank of Japan published a report based on its Project Stella that proposes a peer-to-peer blockchain-like settlement process called distributed ledger technology (DLT). It brings together cryptography, peer-to-peer networks, consensus algorithms and smart contracts, that allow multiple parties to share and process data without a single central management system. While distributed ledger technology presents risk and promise, the study concluded, it remains in the beta phase until further refinements are made to the emerging technology.

Nonetheless, the rationale has always been clear as the industry marches toward instant settlement: Liquidity increases for market participants, quicker access to funds through faster settlements, finance and credit costs decrease.

Because shortening the securities settlement period is a massive undertaking that affects investors, markets and entities, cost and market disruption are ongoing considerations for any further changes. To maintain trust from its cohorts, the financial industry has always opted for a gradual and predictable shift to ensure continuity and trust in the markets. The bigger the change, the more the cost to market participants. Companies may have to upgrade technology to comply, and exchanges will have associated additional technology and training costs—so regulators may need to retool and retrain.

A working group from the SEC is currently researching the basis for a report to reduce the settlement period to one day or same day. This report is expected to be presented to the SEC no later than September 2021.

Furthermore, DTCC is working on an overnight settlement pilot project called Night Cycle Reengineering. This project contemplates a settlement processing algorithm capable of evaluating its members' transaction obligations, available positions, transaction priority instructions and risk management controls while identifying the transaction processing order that maximizes the number of transactions settled.



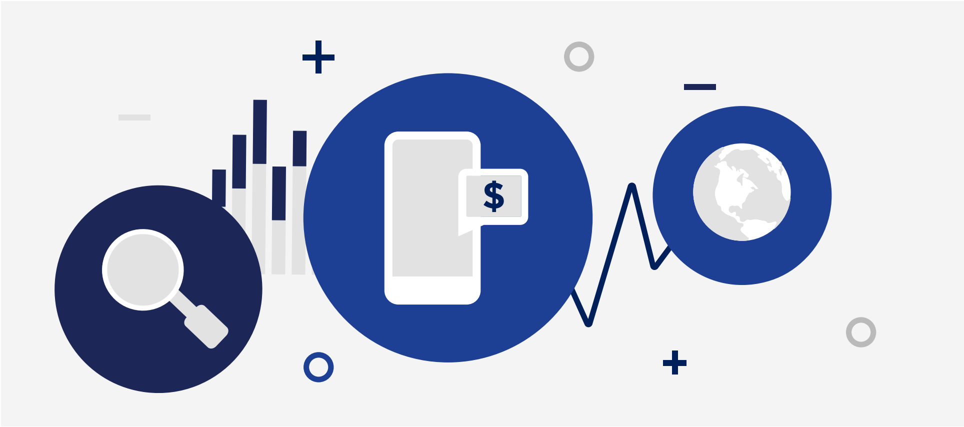
Artificial Intelligence (AI) also shows promise in reducing time and risk. AI technologies are designed to analyze vast amounts of historical trading data at a relatively low cost. It analyzes the exceptions, the bad trades and provides an instantaneous picture of the problem. As the AI System encounters more data and more anomalies, it can begin to learn and predict the likelihood of failed trades. All of these scenarios are aimed at reducing costs and increasing liquidity of the modernizing securities settlement process.

The one constant in settlements is change amid the ever-improving efficiency in the industry. Through these periods of change, investors thrive when they are supported by a trusted, experienced custodian that knows how to use technology to optimize outcomes while understanding the personal side of its clients, too.

Stocks: The Shift from Paper to Digital

At the same time settlement periods have shrunk—and in the process improved liquidity and risk management for investors—technology has also made stock certificates obsolete.

Once prized possessions that were long held by their owners, stock ownership certificates carried both legal and sentimental value. Stock ownership, being a shareholder, was validated through its authentic stock certificate possession, a form of paper currency.



Of course, paper has its problems. In the late 1960s, the trading volume on Wall Street surged, and turmoil around the number of couriers required to carry bags of checks and stock certificates caused a paper crunch and the exchange to extend the settlement period to five days. Wall Street began to envision more efficient settlement process led by electronic means. Then in 2001, the attacks of 9/11 further proved the vulnerability of paper stock certificates, when vaults of them incinerated with the demolition of the World Trade Center.

By 2012, DTCC called for a complete elimination of paper certificates in a white paper called ***A Proposal to Fully Dematerialize Physical Securities, Eliminating the Costs and Risks They Incur.*** The number of paper stock certificates plunged in the vault of DTCC. When the Walt Disney Company shed its iconic stock certificates for its electronic form, the emotional hold on these paper stocks was so strong that a secondary market emerged as collectibles. Paper stock certificates are often collected and framed.