

Real-time Securities Settlement: Global Progress and the Two Paths to T0

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With the US's largely successful move to T+1 in May 2024 and the UK/EU's planned move to T+1 in 2027, the capital markets are looking beyond T+1 to the horizon, questioning what same-day settlement (or T0) would look like. Over the past three decades, the capital markets underwent a progressive shortening of the securities settlement cycle, driven by what was operationally desirable but restrained by what was technically feasible. As technology has advanced and operational constraints have eased with the electronification of the end-to-end trading lifecycle, T0 settlement is becoming a realistic possibility in the not-so-distant future. In this article, the first of a series of four articles on real time settlement, GreySpark Partners outlines the T+1 settlement process, as well as the existing T0 settlement regimes globally and explores the ramifications of the two models of same-day settlement: End-of-day batch processing and atomic settlement.

Between 2022 and 2023, [over 90% of trades](#) were reliably affirmed electronically, which supported the case for a T+1 industry transition. However, the industry's technological readiness globally have not yet reached a point where T0 settlement would be feasible now. Nonetheless, in this rapidly evolving industry, it is important to consider what such a process would look like.

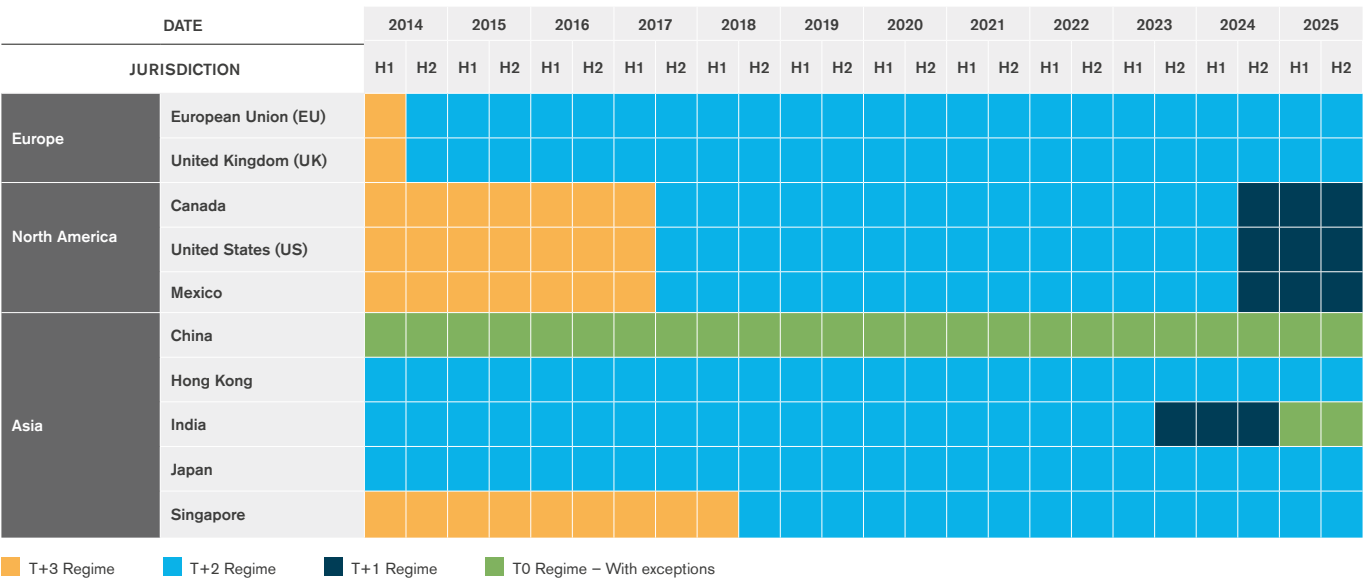
Same-day settlement could mean one of two things: 1) settlement at the end of day using batch processing, or 2) the more challenging 'atomic settlement', where each trade settles instantaneously. To achieve the latter would require a radical front-to-back infrastructure overhaul. Specifically, it would require a comprehensive, institutional adoption of distributed ledger technology. Once thought of as a fringe technology, market participants now less averse to the exploration and adoption of this technology. Blythe Masters, who was credited with building JPMorgan's derivative and commodities desk [into a global powerhouse](#), stated later that "*financial services infrastructures have not evolved in decades. The front end has evolved but not the back end. [...] the post trade infrastructure hasn't evolved at all.*" In the same interview, Masters highlighted the applicability of blockchain technology (a specific type of DLT) as a decentralised and shared transaction record.

Current Regimes Across the Globe

The shortening of settlement times across the globe has progressed at different rates across different jurisdictions. North America was slow starting but has accelerated past Europe. Two other outliers are China and India, which has surged ahead in cutting the time taken to reach settlement. **Figure 1** shows the current settlement deadlines for 10 jurisdictions across the globe, and how they changed between 2014 and 2025.

Figure 1: Equities Settlement Timelines Across the Globe

Source: ESMA, SEC and GreySpark analysis



China

China is often described as operating a form of T0 settlement for equities, however, there are some specifics around this. In practice, the market functions as a 'no funding' environment, meaning that participants must already hold the securities they intend to sell or the cash they expect to spend before executing a trade. This removes the need for margining mechanisms and intermediation of the kind that western markets rely on through CCPs and clearing brokers.

Furthermore, China does [not operate a fully T0 settlement model](#). While the securities leg of a trade is transferred on trade date (T0), the cash leg typically settles on the following day (T+1). Through this method, settlement in the Chinese market is accelerated relative to T+1 markets, but not all trades fully settle on T0.

India

The Securities and Exchange Board of India (SEBI) completed its transition from T+2 to T+1 in January 2023 and, subsequently, launched an optional T0 pilot programme in March 2024. This pilot scheme initially covered 25 stocks and was gradually expanded to [525 stocks through the year](#).

Adoption of this scheme, however, has been extremely limited which has prompted the SEBI to indefinitely extend the timeline for any mandatory implementation, signalling that T0 will remain optional for the foreseeable future. After a year of operation, the T0 pilot scheme recorded [only 83 trades on the NSE and 56 on the BSE](#) (India's two stock exchanges), with a combined value of approximately USD 7,400. The low adoption was a result of the additional operational complexity, as well as the premium fees brokers were charging for such trades. GreySpark will explore this in further detail in the final article of this four article series.

UK and EU's Move to T+1

For the move to end-of-day batch settlement, GreySpark posits that the key challenges highlighted by market participants, throughout the ongoing UK and EU transition to T+1 would be accentuated under further compressed timelines.

Figure 2: Challenges Faced by EU and UK Firms Preparing for T+1 Settlement

Source: [Citi Securities Services Evolution 2024](#)

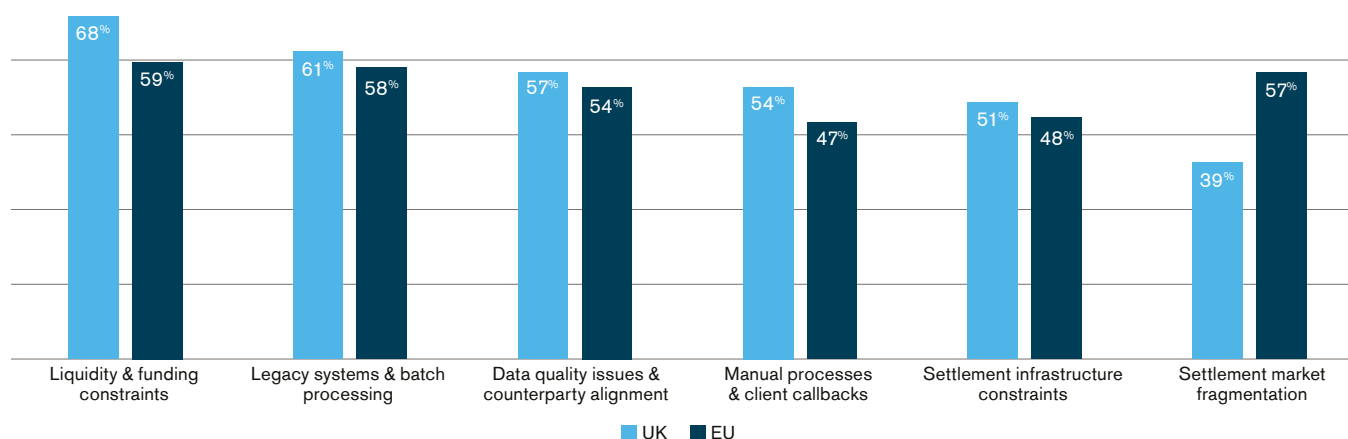


Figure 2 shows the leading concerns for the ongoing transition to T+1 in the UK and EU include cash funding and intraday liquidity management, the continued reliance on legacy technology stacks, persistent data quality and consistency issues across counterparties and the level of manual intervention still required in post-trade workflows, such as exception handling. These challenges become more consequential as the available time to resolve errors, mismatches or funding gaps is compressed. At some point in this industry-wide compression, funding gaps would most likely have to be resolved before entering into a trade under any same-day settlement model.

As was observed during North America's transition to T+1, foreign investors are among the most significantly affected by the compression. [The Asia Securities Industry and Financial Markets Association](#) (ASIFMA) has highlighted that time zone differences introduce substantial operational complexity, particularly in regard to FX management. Under a T+2 cycle, as well as a T+1 cycle, global investors benefit from a window to source and convert currency after the securities transaction. Under a same-day settlement cycle, investors would have to pre-fund positions, exposing foreign investors to currency risk before they have certainty over execution outcomes and it reduces their ability to optimise liquidity.

The Two Models of T+0 Settlement

As market participants discuss the transition from T+1 to T0, it is important to recognise that the term T0 settlement could refer to two fundamentally different models, each with distinct operational implications, infrastructure requirements and feasibility timelines:

1. End-of-day settlement; and
2. Atomic or Real-time settlement.

End-of-day Settlement

End-of-day settlement is where trades done at any point throughout the trading day are accumulated and batched together by the clearinghouse and settled in bulk by close of business. This approach preserves the critical mechanism of multilateral netting, whereby the clearinghouse consolidates all buy and sell orders for each security across all participants, calculating net positions rather than settling each individual trade. The efficiency gains from netting are substantial. For instance, on an average trading day in the US market, the DTCC's netting process reduces settlement requirements [by approximately 98%](#), consolidating around USD 1.77 trillion in gross trading activity down to approximately USD 38 billion in final settlement obligations. Maintaining this netting functionality, preserves capital efficiency and ensures that clearinghouses can still guarantee trade settlement.

Real-time or Atomic Settlement

Real-time, or 'atomic', settlement is a more radical departure from current practice. Under this model, trade execution and settlement occur together instantaneously, with no intervening time gap between when counterparties agree to trade and when securities and cash are exchanged. The term 'atomic' derives from the concept that such settlement can only have two states: complete or failed, with no intermediate pending status.

This approach would require significant changes to market infrastructure. Namely, it requires the market-wide adoption of blockchain-based distributed ledger technology (DLT). However, such a change would have to be adopted either on an exchange-by-exchange basis or on a jurisdiction-by-jurisdiction basis, as was the case for the move to T+1 settlement. Unlike end-of-day batch settlement, which builds upon existing clearinghouse infrastructure, real-time atomic settlement is requires purpose-built blockchain platforms where infrastructure has been designed from the ground up with instantaneous settlement in mind.

As radical as the concept of atomic settlement sounds, it is increasingly being discussed by market participants. Indeed, a [2024 Citibank survey](#), the results of which are shown in **Figure 3**, found that 40% of global market participants expect real-time settlement within 10 years up from 13% in 2023.



End-of-day Settlement Case Study

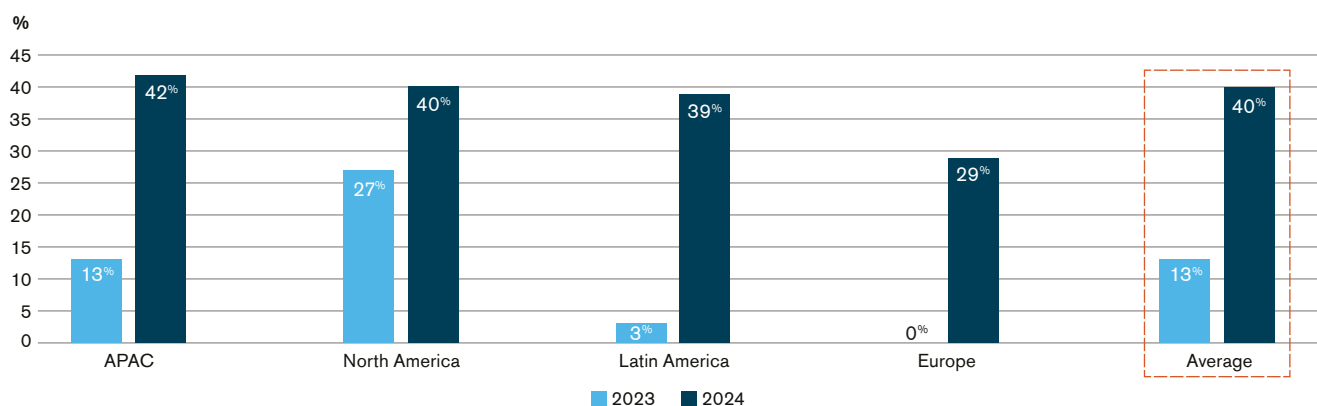
The DTCC's National Securities Clearing Corporation (NSCC) currently processes end-of-day settlement for transactions received prior to 11.30am Eastern Time. It successfully handles over [one million end-of-day transactions daily](#) using existing infrastructure. Crucially, this approach maintains clearinghouse guarantees, meaning the NSCC continues to novate trades and guarantee their completion.

Market participants retain the confidence that buyers will receive their shares and sellers will receive their payment, with the clearinghouse acting as credit intermediary and absorbing counterparty risk.

This preservation of proven risk mitigation mechanisms makes end-of-day batch settlement an evolutionary rather than revolutionary change to market structure, building upon existing infrastructure and operational models rather than requiring their complete replacement.

Figure 3: Regional View of Whether the Prevailing Settlement Time Frame for Equities will be Real-time

Source: [Citi Securities Services Evolution 2024](#)



Benefits of the Move to Atomic Settlements

There are undeniable benefits and challenges to implementing atomic settlement including:

- **Benefit – Reduced Back-office Burden:** Through the blockchain approach, a single ledger is held by all parties, reducing the immediate post-trade back-office work at the buyer and seller, such as trade enrichment, and the three-pronged trade matching and affirmations process by the buy-side firm, the custodian and the executing/clearing broker. Currently, each party maintains its own records and sometimes extensive and time-consuming reconciliation are required to resolve breaks and ensure each party's records match. A synchronised distributed ledger eliminates much of this complexity by providing a shared source of truth. Should the distributed ledger be implemented as a utility model, the mutualisation of cost across the industry would eliminate the mark-up introduced by intermediating service providers.
- **Benefit – Settlement Cycle Reduction:** The biggest benefit of real-time settlement is that it would eliminate settlement fails entirely as buyers and sellers would only be able to trade if they possess the cash or securities at that moment and can settle it immediately, or with the manual lag of an hour or more highlighted above.
- **Benefit and Challenge – Automation via Smart Contracts:** DLT allows the automation of many actions via smart contracts, which self-execute when certain conditions are met. While automation occurs in current, conventional systems with SWIFT messaging, where DLT differs for the blockchain-based method in that as settlement would be encoded in the smart contract, when conditions are met, a party cannot fail to deliver or fail to pay. The contract executes regardless.
- **Benefit and Challenge – The Move to 24/7 Trading:** Global markets would operate almost continuously, especially in FX and digital assets, requiring around-the-clock processing. Nasdaq announced its planned 24-hour trading, five days a week, from the second half of 2026, while ICE is developing NYSE Texas for extended hours for its global investors.

Looking Ahead

While technically feasible, atomic settlement is certainly not imminent. Conclusive proof that the benefits will outweigh the enormous transformation costs has not yet been found. While blockchain and smart contracts are proven concepts, the barriers are operational, structural and compliance, rather than technical. The real challenge is coordinating the overhaul of existing technology stacks, deployment of nodes across market participants and reconciling the new infrastructure with existing legal frameworks.

End-of-day settlement offers a more pragmatic approach to a further accelerated settlement cycle for traditional securities, preserving the existing role of clearing house and existing broker and custodian systems while still achieving same day settlement. Real-time, or atomic, settlement on the other hand represents a revolutionary model which remains better suited for digital assets, an asset class for which the infrastructure was built from the ground up.

Further evidence that dampens the strong positive response from market participants is that optional participation in current T0 settlement schemes has been low, as exhibited by the low participation in India's T0 pilot scheme. This reflects the wider opinion heard at industry events, that T+1 must be conquered first. The industry must learn lessons from that and address existing operational gaps before seriously considering the gigantic operational leap to atomic settlement.

In the second of four articles on T0 settlement, GreySpark examines the core technical and operational differences between atomic settlement, underpinned by blockchain-based DLT, and traditional T+1 settlement. This will include how ownership verification shifts from institutional intermediaries to cryptographic proof, the varying degrees of decentralisation possible with DLT, the implications of removing multilateral netting from the process and the changing roles of market participants under a blockchain-based model.