# Credit Risk in Capital Markets

Could intraday credit risk be the next focus

JD Risk Solutions | HQLAˣ

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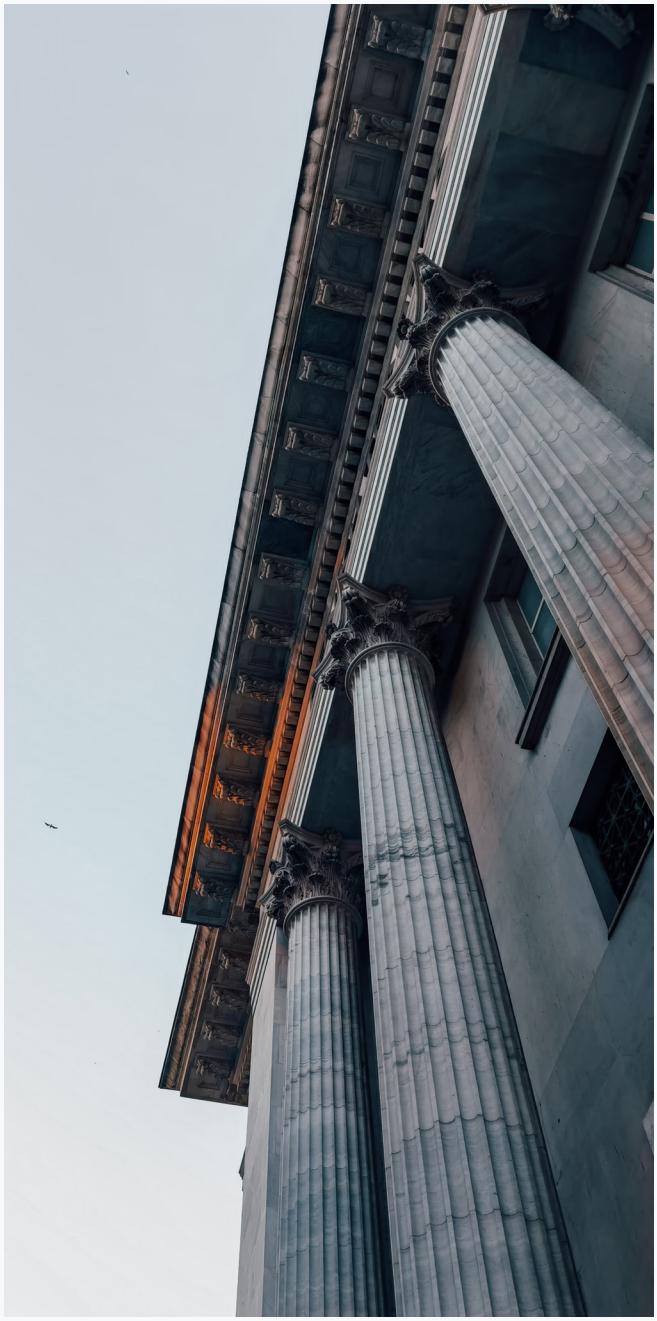
# Executive summary

Securities financing tools play a critical role in optimizing financial resources for banks in a market structure increasingly reliant on collateral. These transactions, however, introduce intraday credit risk, arising from both the settlement process and market fluctuations that alter the value of securities or collateral provided by borrowers to protect lenders.

This risk is further amplified by the intraday credit lines provided by settlement agents to transaction participants, compensating for the fragmented and complex network of custodians and securities depositories that manage ownership records of securities.

While regulations addressing liquidity requirements target intraday risks, there is currently no equivalent framework for managing intraday credit exposures, which can be significant. This gap may largely be due to the lack of effective tools for market participants to manage such risks without limiting their securities financing activities, potentially undermining market liquidity and stability.

In this context, we discuss how potential future regulations could evolve to address intraday credit risk, and the impact this may have on bank financial resources. Additionally, we assess how emerging technologies, such as Distributed Ledger Technology (DLT), could offer solutions to mitigate these risks, potentially reducing the capital requirements associated with any future regulatory measures.



# Introduction

The management of credit risk has played an important role in trade and commerce for millennia. Even relatively modern concepts such as rating agencies have been with us for more than a century, and the increasing role of financial markets has required evolution in the approach to assessing and managing credit risk.

This evolution has not always been successful.

Firstly, the balance between economic growth through credit expansion and the need to manage systemic risk, has always been difficult to strike, with regulators and supervisors often being seen as overly conservative during prolonged periods of benign markets, but far too lenient during the start of periods of systemic crisis.

Secondly, the lines between credit risk, and other forms of risk have become blurred as financial products have developed, alongside the way they are accounted for, allowing issues to fall between the cracks. Are losses arising from a bank liquidating a client portfolio upon default just credit risk? Or would they be defined as market risk because markets have moved after the client defaulted? Or would they be classified as liquidity risk because the liquidation value of collateral fell below the closing market value?

One trend however has always been clear — the desire to learn and to not repeat mistakes from the past.

In this paper, we explore the evolution of credit risk since the Global Financial Crisis (GFC), focussing on the events that have occurred, and the regulatory response to these.

We initially focus on the credit risk within three main forms of collateral activity for banks, which themselves have formed the backbone of credit risk mitigation over the last decade: repo, securities lending, and OTC Margin.

We then turn our attention to intraday credit risk within this activity, the current and potential future regulatory focus, and the implications this may have on financial institutions.

Finally, we explore the role that platforms such as HQLA$^X$, running on new technologies, can play in the mitigation of intraday credit risk specifically.

# Credit risk in capital markets

## Credit risk in the news

The loss of nearly $100bn for AIG in 2008[1] was a significant catalyst for much of the banking regulation today. Whilst much of the headlines focused on AIG's losses in credit derivatives, it was AIG's securities lending activity that shone a spotlight on the credit risks that borrowers of securities face. With $75bn in securities lent, and 65% of the proceeds invested in MBS, ABS, and CDOs at the end of 2007, credit risk fears drove AIG's counterparties to return borrowed securities, and recall $24bn in cash in September 2008[2], forcing AIG to try to liquidate concentrated positions in illiquid and falling markets.

## Credit events in the last decade

Whilst the global financial crisis was one of the most significant periods of credit stress and losses in recent times, it certainly has not been the last.

In March 2021, the collapse of Archegos Capital Management resulted in losses of approximately $10bn for banks. The losses were predominantly as a result of prime brokers having to liquidate large concentrated stock positions held by Archegos, highlighting once again the credit challenges related from concentration and liquidity risk.

Silicon Valley Bank's failure in March 2023 was the largest US bank failure since the 2008 crisis, and the second largest by assets in US history. FDIC announced at 5pm UK time (12pm EST)[3] that SVB had been closed, highlighting the fact that defaults can occur intraday.

Finally, the Liability Driven Investment (LDI) crisis in September 2022, triggered by a rapid increase in UK Gilt yields after the UK budget, could have resulted in the failure of UK pension funds without the intervention by the Bank of England. The moves triggered large increases in exposures for banks on interest rate swap positions, and hence large overnight margin calls for pension funds, totalling in excess of £70bn from 23 September to 14 October 2023.

## The drivers of credit risk in securities transfers

Collateralisation has been at the centre of regulatory efforts to mitigate credit exposures, and whilst the introduction of the uncleared margin rules, and the focus on mandatory central clearing, has done much to reduce exposures, risks still remain.

Collateral transformation is an essential part of running any financial institution in order to maintain the efficient use of financial resources. By converting securities held on balance sheet, and being received as collateral, into securities that are eligible for their own posting, settlement, or even regulatory holding requirements, institutions can reduce the need for additional liquidity and funding.

The increased demand for collateral, and in particular, High Quality Liquid Assets (HQLA), as a result of regulatory changes over the last decade, has amplified the importance of collateral transformation, and securities financing tools such as repo and securities lending.

Although these tools are crucial for enabling counterparties to efficiently use collateral to mitigate credit risk, they are, in themselves, transactions. As demonstrated by the collapse of AIG more than 15 years ago, they can also present themselves as sources of credit risk

With both repo and securities lending transactions, one party is, for all intents and purposes, a borrower of securities and the other is a lender. Whilst the transactions are collateralised to protect the lender, this collateralisation happens periodically based on the value of the securities at a specific point in time. Any divergence away from this value over a period of time results in credit risk for one of the parties, and a substantial quantum of divergence can occur intraday.

1 SEC Filing — AIG Form 10-K (2008)
2 Federal Reserve Bank of Chicago (2014) — AIG in Hindsight
3 Bank of England — Report under section 79A of the Banking Act 2009 on the transfer of Silicon Valley Bank UK to HSBC UK

## The demand for HQLA

Over the last decade, regulatory changes introduced to reduce credit and liquidity risk in the financial system, have dramatically increased the need for collateral, and particularly HQLA.

The Liquidity Coverage Ratio (LCR) requirements were created with an objective to ensure that financial institutions held assets less susceptible to market volatility, that could be easily liquidated, to ensure that banks could sustain liquidity outflows over a 30 day period of significant liquidity stress.

The phase-in of LCR for European banks commenced in 2015 with banks required to hold 60% of their HQLA requirements (increasing to 100% at the start of 2018), and the corresponding holdings of HQLA at European banks increased by €1.4 trillion over a similar period.[4]

Uncleared Margin Rules (UMR) were introduced globally at a similar time requiring firms to post variation, and, in many cases, initial margin against OTC derivative exposures.

Although the variation margin rules came into effect in 2016 for all eligible institutions, the more substantial impact stemmed from the requirement to bilaterally post initial margin, determined by the size of the bilateral risk. This requirement began in 2016 for the largest financial institutions and was extended to any organization with outstanding derivative gross notional amounts exceeding €8bn (with similar requirements for institutions outside Europe).

The observed increase of regulatory initial margin posted and received globally for the largest financial institutions from 2017 to 2023, primarily as a result of the uncleared margin regulation, was $213bn for posted margin, and $266bn for margin received.[5]

## The current settlement infrastructure creates unique challenges

In the current settlement infrastructure, the ownership of a security by a party is maintained through a cascading chain of custodians and securities depositories, often influenced by the jurisdiction of the issuer and the securities holder.

If all securities participants were to use the same securities depository, the transfer of securities would require a relatively trivial book entry update of the ownership record in their system.

Unfortunately, this is far from the practical reality.

To facilitate the transfer of securities between parties across jurisdictions, using different custodians or securities depositories, a complex set of links is created by these custodians or securities depositories maintaining accounts with one another.

When a cross-border securities transaction takes place, the ownership records at the relevant depositories must be 'aligned' to reflect the transfer of securities between them. Since current technology does not allow for simultaneous updates, operational risk is inherent in this process.

Additionally, the transfer requires the movement of cash between these intermediaries, which faces similar challenges, albeit through a different set of infrastructure.

Without the intraday credit extended by settlement agents to transaction participants, the settlement of securities transactions would either take a significant amount of time or consume large amounts of liquidity. While the counterparty risk associated with this intraday credit is largely mitigated for the settlement agent through the collateralization of other securities held by participants, these securities are often part of other transactions. A participant default, and the subsequent liquidation of these securities, could trigger a cascading series of failures across the system.

4 European Central Bank (2019) — Occasional Paper Series (Number 218) — Availability of high-quality liquid assets and monetary policy operations: an analysis for the euro area

5 ISDA — ISDA Margin Survey year-end 2023

## Spotlight on repo and securities lending transactions

Whilst there are notable similarities between repo and secured lending transactions, there are also fundamental differences in the mechanics of the flows, the client base, the underlying securities being transferred, and, more broadly, the purposes for entering into these transactions

Securities lending activity is typically motivated by banks needing to borrow securities to meet settlement obligations, to upgrade the collateral quality of inventory or to cover short positions, and lenders, who are typically long only entities, looking for opportunities to enhance revenues.

Borrowers of securities, which can include equities and bonds, post collateral in the form of cash or securities to mitigate credit risk for the lender. In the US market where collateral is still predominantly cash, lenders of securities generate returns by using the cash collateral to purchase assets within a cash reinvestment vehicle.

A borrower in a securities lending transaction can usually return the securities and request their collateral back on demand, and this can cause challenges for the lender depending on the maturity, quality, and hence underlying liquidity of the assets the cash collateral has been invested in, as observed with AIG during the global financial crisis.

In contrast, repo transactions are typically driven by the need to borrow or lend excess cash and are generally secured by high-quality debt securities. This is why repo markets are often viewed as a barometer of market health during periods of market stress, cash lending tends to decline sharply as banks seek to preserve cash, which can further intensify market turmoil. In such cases, significant events often prompt central banks to step in as lenders of last resort to stabilize the markets.

In both repo and security lending transactions, both parties need to be mindful of any correlations between the securities, collateral, and the counterparties to ensure that any wrong way round risk, where, for example, a fall in the value of a security or collateral also results in a deterioration of the credit quality of the counterparty, has been adequately considered.

Finally, with any type of transaction involving a bilateral exchange between two parties, the most significant driver of credit risk is settlement risk — the risk that you deliver, and your counterparty does not.

With repo transactions, this is largely mitigated through the widespread use of Delivery vs Payment. Securities lending transactions however, typically settle Free of Payments (FoP), where the transfer of securities occurs independently of the receipt of any collateral, resulting in settlement risk for both parties.

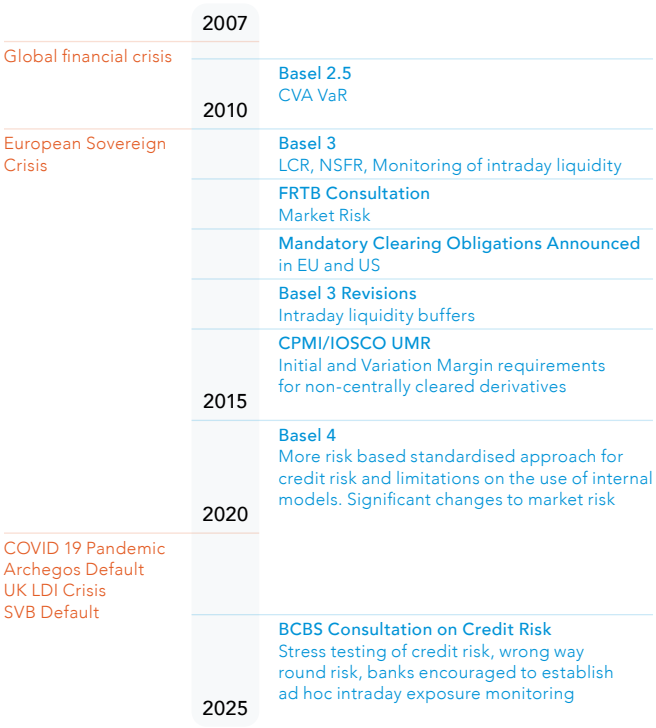
## The regulatory spotlight shines on past crisis

The global financial crisis was a pivotal moment, influencing almost every piece of significant banking regulation for the decade that followed.

The failures, near failures, and colossal losses highlighted areas across credit, market, and liquidity risk management, requiring a complete overhaul to make financial markets safer.

Twelve US bank holding companies took over $53bn of losses in CVA reserves[5], duration mismatches in assets and liabilities, and insufficient liquidity to sustain outflows, required previously unseen levels of co-ordinated liquidity injections from central banks, and exposures from derivative contracts took the system to the precipice of systemic collapse.

Protecting the financial system from these failures became the focus of regulators, supervisors, the Basel Committee, and even the G20, culminating in the subsequent regulatory proposals and changes. More significantly, these events changed the regulatory and supervisory landscape to one that was more homogenous, and more focused on learning outcomes from risk events.




Graphic 1: Timeline of significant risk events and major regulatory announcements

Significant margin calls resulting from the extreme market moves were a key feature of the COVID 19 pandemic, and in September 2022, BCBS, CPMI, and IOSCO produced a review of margining practices highlighting, amongst 5 other recommendations, the need to enhance the liquidity preparedness.[6]

The past 5 years have seen intraday risk management become a more prominent feature in banking regulation as a result.

The Basel Committees' Supervisory Review Process on liquidity monitoring metrics in 2019 included 15 pages of very specific requirements for banks to follow, and the incorporation of the market risk requirements of the Fundamental Review of the Trading Book (FRTB) within Basel IV, will explicitly identify intraday market risk activity within trading books.

In stark contrast to liquidity and market risk, intraday regulation has still remained vague in counterparty credit requirements.

In 2021, the default of Archegos Capital Management resulted in cumulative losses of over $10bn[8], and for many banks, the largest losses suffered since the global financial crisis. The identified gaps in counterparty credit risk management were of specific focus in the 2024 consultation by the BCBS on the guidelines for counterparty credit risk management. Whilst intraday credit risk was not a direct cause, it was suggested that banks establish intraday exposure monitoring in order to assess the impact of large intraday moves.[7]

As we assess the future of intraday credit risk regulation, we identify three potential approaches that regulators may adopt.

The first approach involves maintaining the status quo, where regulators impose no additional requirements beyond the current non-binding guidance and recommendations, unless a significant risk event occurs in which intraday credit risk plays a central role.

The second approach entails regulators increasing their focus by monitoring and comparing bank exposures with requirements of additional disclosures from banks.

The final approach sees regulators intensifying their focus on intraday credit risk, similar to the approach taken with intraday liquidity risk under the Basel III revisions. This would likely lead to the introduction of more explicit capital requirements, driven by their evaluations of the risks posed by intraday credit exposure, particularly in the context of securities financing transactions.

6 Basel Committee on Banking Supervision (2022) — Review of margining practices
7 BIS — Supervisory Review Process: SRP 50 — Liquidity Monitoring Metrics
8 Basel Committee on Banking Supervision (2024) — Consultative Document — Guidelines for counterparty risk management

## Intraday approaches in regulation

Given the different nature of liquidity and market risks, regulation has taken different approaches to ensure that banks maintain sufficient levels of capital or liquidity to mitigate these.

For the computation of intraday liquidity buffers as part of the Basel III requirements, banks are required to calculate their intraday liquidity needs in normal market conditions and then estimate how much this could change in periods of market stress.

Intraday liquidity is needed to meet intraday cash outflows which occur before any expected cash inflows, and the requirement focusses on the maximum intraday cash drawdown:


For banks, often the most prudent way of computing requirements for normal times is to use historical utilisation as a gauge, especially given that their liquidity monitoring metrics[7] require banks to report maximum intraday liquidity utilisation for the reporting period.

Upcoming market risk regulation, first discussed as the Fundamental Review of the Trading Book (FRTB), and now to be adopted as part of the Basel IV reforms, considers intraday risk and activity in determining the eligibility of banks internal models for a given trading desk.

In this approach, banks compare their Value at Risk (VaR), a measure of expected market losses for a given risk profile (often computed using historical data), to actual realized P&L. Where actual losses are greater than the VaR (e.g. due to large trading intraday activity), a backtesting exception is generated.

Whilst this construct is not new, what differs with FRTB is the need to conduct these tests at a desk level instead of an aggregate bank level. Where desks have significant intraday activity relative to end of day risk, there is more potential for a VaR backtesting exception to occur. As an example, a trading desk that traded solely intraday with no end of day risk would have a VaR of zero, and any actual loss occurred would cause a backtesting exception.

The implications of this for desks suffering backtesting exceptions more than a defined number of times, is the need for the desk to revert to a standardised model for market risk capital requirements.

# The materiality of intraday credit risk

As previously noted, the risk profiles of securities lending and repo transactions differ significantly. This is primarily due to the limited use of Delivery versus Payment (DvP) in securities lending transactions and the higher market volatility associated with the securities involved in these transactions.

For this reason, we focus our analysis on the materiality of intraday credit risk, within the securities lending market.

There are two primary drivers of intraday credit risk within securities lending transactions: Settlement risk, as discussed previously, is the risk that one party fails to deliver in a bilateral settlement. Potential Future Exposure (PFE) is the risk that may arise as a result of market moves at a future point in time.

In the absence of some form of settlement risk mitigation (such as Delivery vs Payment, as used in most repo transactions), the magnitude of the risk from the perspective of the lender is to the full market value of the securities being borrowed, and from the eyes of the borrower, the total amount of collateral being posted. This exposure occurs twice for each transaction: once at trade initiation, and again at trade maturity.

Though settlement risk is clearly very significant, potential future exposure cannot be ignored in the context of building a complete picture of intraday credit risk.

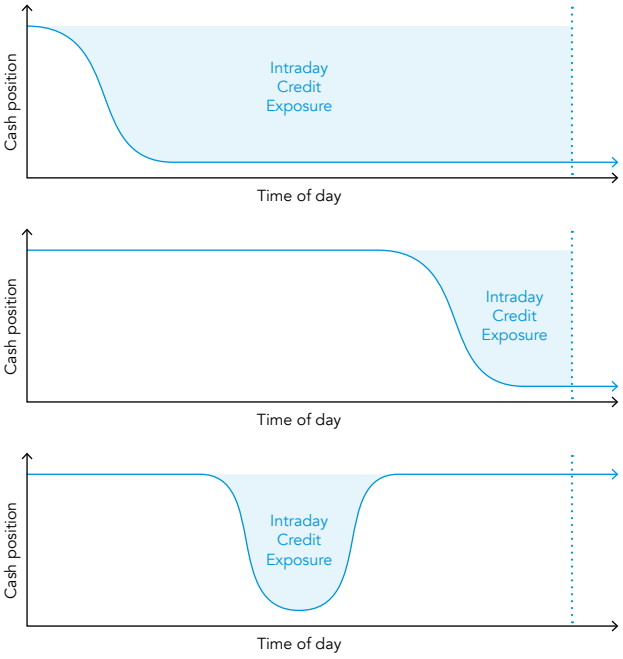
On 6 May 2010, major US equity markets plunged approximately 6% intraday, leaving them down 10% at a point in time, before closing down 4% on the day. Some individual stocks had dropped as much as 20%.

For securities lending transactions involving US equities, this decline in equity markets would have caused lenders to hold a substantial excess of borrower collateral relative to the new, lower market value of the securities. As a result, borrowers may have been left with significant credit exposures to these lenders.

This move would have had an impact on credit exposures and capital models (assuming that capital requirements were calculated daily), but only in as much as the decline of 4% on the day. The additional exposures when markets were down a further 6% intraday, would not have been reflected in any of the capital models.

Data from a recent ISLA report showed that approximately $600bn of North American Market securities were on loan at the end of H1 2024.[9] If a "flash crash" of similar magnitude were to happen again, a 6% intraday move would result in $36bn of unrecognised intraday credit exposures for borrowers.

Intraday credit exposure is not limited solely to intraday spikes — any market move occurring before markets result in intraday exposure:




The difference between these scenarios is the time period that a counterparty may be exposed to this intraday exposure, and whether the exposure gets incorporated into existing capital models because it persisted until the end of the day.

9 ISLA — Securities Lending Market Report — H1 2024

# Quantifying potential financial resources for intraday credit risk

## Magnitude of exposures

To quantify the magnitude of intraday credit exposures, we must consider both the contribution arising from the settlement of securities transactions, and the potential future exposures that are created because of market moves.

There are many parallels that can be drawn between these drivers of intraday credit risk and the better understood topic of intraday liquidity, and this is by no means coincidental — the two are heavily connected.

Whilst intraday liquidity considers both the liquidity and funding that is required to meet intraday payment obligations, irrespective of the duration this need arises, intraday credit exposure focuses on the incoming payments (including margin calls, securities settlements, and OTC payments), and the risk that the counterparty making these payments, defaults on their obligations, again, irrespective of how long this exposure persists. Intraday credit exposure is, in effect, a probability of default adjusted measure of intraday liquidity inflows.

When we consider intraday liquidity needs driven by payments, the process is theoretically straightforward, as these are deterministic and hence known in advance. Similarly, intraday credit risk arising from the settlement of securities lending transactions can also be measured in advance.

Without the ability to look into the future, intraday credit risk arising from potential future exposures cannot be predicted as they are a function of the magnitude of risk, and the actual intraday moves in the underlying market. Precisely the same scenario arises for intraday liquidity risk when considering the additional liquidity needs from intraday margin calls from clearing houses and exchanges.

The magnitude of risk driving these potential future exposures is itself a known quantum. For securities financing transactions, including securities lending and repo activity, this is a function of the quantum of securities on borrow and on loan to each counterparty, and for derivative transactions, and the underlying risk sensitivities on a counterparty-by-counterparty basis.

Future intraday market moves on the other hand cannot be predicted and hence must be estimated, by using past observations for each asset class.

Our stress scenario estimates of $39bn of intraday credit exposure arising from potential future exposures for securities lending alone are not insignificant. Based on data from the Office of the Comptroller of the Currency, our estimated intraday credit exposure for potential future exposures in securities lending transactions was over 6% of the total potential future exposure for all derivative transactions for the top 25 commercial banks, savings associations and trust companies.[14]

Including our $80bn estimated intraday credit risk arising from settlement exposures, we estimate a total of $119bn of intraday credit exposure for securities lending transactions.

10 Financial Stability Oversight Council — Annual report 2017
11 DataLend — The Purple — Securities Lending 101: Understanding Market Metrics
12 U.S. Department of the Treasury, Board of Governors of the Federal Reserve System, Federal Reserve Bank of New York, U.S. Securities and Exchange Commission, U.S. Commodity Futures Trading Commission — The U.S. Treasury Market on October 15, 2014
13 DataLend — The Purple — Q3 2024 in review
14 Office of the Comptroller of the Currency — Quarterly Report on Bank Trading and Derivatives Activities — First Quarter 2024

## Intraday credit exposures from potential future exposures

In October 2017, based on data from the Financial Stability Oversight Council (FSOC), the global value of securities on loan through securities lending transactions was $2.3 trillion, of which $1 trillion was in the United States, with just over 50% on loan against cash collateral.[10]

Whilst the securities lending market, based on 2020 data, is only approximately 35% of the size of the repo market in the US[11], it is the focus of our analysis given that repo securities are typically lower risk government or agency securities and, in many cases, of overnight term.

Of the $1 trillion, 85% of the securities borrowed through securities lending transactions in the US market were borrowed by broker dealers. Extrapolate the trend for the US market to the global market, and it would imply that nearly $2 trillion worth of securities were being borrowed by broker dealers.

Among these securities on borrow in the US, approximately 47% were equity securities, and 42% were government or supranational bonds, which again extrapolated to represent the global market, would imply that of the potential $2 trillion borrowed by broker dealers, $940bn was in equities, and $840bn was government or supranational bonds.[10]

Without significantly more details with regards to the underlying securities such as the underlying equity indices, and the issuing country and maturity of the sovereign bonds, it is impossible to estimate the magnitude of intraday exposure that banks would have been exposed to.

We can however make some simplistic assumptions to help understand the potential scale of these exposures, and for this example we assume that all equity securities were represented by the S&P 500, and all government and supranational bonds are 10-year US Treasuries.

We can also take recent significant intraday moves in these markets to represent times of potential stress for intraday credit. For the S&P 500, we use the 2010 flash crash, and the 6% intraday move[9], and for 10-year US Treasuries, we use the 2014 flash rally where prices rallied nearly 2% intraday[12]. Without further details for the remaining $220bn of securities borrowed by banks, we assume these remain unaffected in any stress scenario.

In this example, we would see bank intraday credit exposure spike by $56bn because of the equity price drops, offset by $17bn because of the rally in US Treasuries, leaving a net intraday credit exposure of $39bn in this stress scenario. This assumes that the value of any collateral provided by banks against the securities borrowing, remains unchanged.

While the data is based on figures from October 2017, it remains relevant, especially considering the securities lending market has grown by approximately 15% as of September 2024[13]. Had more recent detailed data been available, these exposures would likely be even larger.


## Intraday credit exposures from settlement exposures

Estimating the magnitude of settlement exposure is challenging. Securities lending transactions are often open ended and therefore there is limited data available regarding the weighted average maturity of these transactions. $2.3 trillion of securities being recalled and lent out again every 24 hours would create a dramatically different exposure than the same happening once a year, even though the volume of securities on borrow at a given time would remain the same.

In a 2019 report by DataLend, the duration of secured lending transactions depending on region and type of collateral ranged from 62 days for European equities to 198 days for European Sovereign bonds[11], and general collateral for equities across regions averaged approximately 70 days in duration.

Given the lack of more appropriate data, if we can assume that the average securities lending transaction also had a weighted average maturity of 70 days, it would imply that each security would be borrowed and returned approximately 5 times a year. If we also assume that each of these transactions were spread equally through 250 trading days a year, our annualized gross $10 trillion of securities lending transactions would generate approximately $80bn of intraday credit exposure ($40bn on the borrow of the securities, and $40bn on the return of collateral) for broker dealers every trading day.

## Impact of counterparty quality on magnitude of risk

Whilst the net intraday credit exposures of $80bn and $39bn in our examples are significant in magnitude, it is important to understand that this does not imply that banks could lose $119bn because of a credit event that occurs intraday — for this to happen, every single counterparty that banks borrowed securities from would need to default simultaneously.

To quantify the actual credit risk, both the exposure to a given counterparty, and the likelihood of that counterparty defaulting are of equal importance, with the industry accepted credit risk measure, expected loss, being a product of exposure at default and probability of default, on the assumption that there will be no recovery of funds from the defaulted counterparty.

Historically, default probabilities were linked to the credit ratings of counterparties or implied from market observables such as CDS spread. This approach was appropriate for corporates with conventional business models, where cashflows, profitability and balance sheets could be assessed with financial ratios, and internal ratings could be compared to the assessments made by external rating agencies.

However, when making assessments of institutional investors such as funds, the process of applying internal ratings by banks becomes more ambiguous and inconsistent, given the limited publicly available data to make such assessments.

For this reason, the regulatory direction has been to floor or prescribe such assessments of rating and hence default probability.

## Potential implications to capital

To improve consistency, regulators are also reducing the applicability of internal models for aspects of the capital calculation, or applying output floors (as with Basel IV) on the capital requirements based on a percentage of a standardised capital calculation.

When we examine the standardised capital rules for securities lending transactions, the Basel Framework requires banks to calculate to calculate exposures using CRE22. This approach (outlined in 22.65 of the text[15]) considers a baseline exposure based on the value of securities borrowed against any collateral posted, and supplements this with an add-on to account for the fact that the value of the securities may change over an assumed 10 day holding period, and a further add-on to consider any currency mismatches between the securities and the collateral.

To compute the Risk Weighted Assets (RWA) requirements, exposures are risk weighted (to adjust them for the likelihood of default) using weights prescribed in regulatory text based on the type and rating of the counterparty.

Our analysis suggests that intraday credit risk could attract a total of $48bn in additional risk weighted assets in aggregate across banks borrowing securities in securities lending transactions.

## Computing intraday RWAs

If regulators were to adopt an approach outlined in our prior examples for computing intraday exposures to settlement risk and potential exposures arising from intraday stress, these exposures would simply need to be risk weighted by counterparty type to compute the RWA requirements for banks.

The 2017 FSOC report provided a breakdown of the US securities on loan by owner type. Almost one third were on loan by pension funds and Endowments, another third was to governmental entities, and the remainder was to other types of counterparties such as investment firms[10].

Assuming that the governmental entities are sovereigns rated AA- or above, the BCBS text assigns these a 0% risk weight. With the other types of entities, including investment firms, where transactions are three month in duration or shorter, we assume these are transactions with high rated banks (the least punitive scenario), attracting a risk weight of 20%[14].

Finally, risk weights for exposures to unrated financial institutions that are not regulated as banks (e.g. pension funds) are all treated as unrated corporate exposures by the BCBS, attracting 100% risk weights.[16]

Using this approach, one third of our intraday securities lending exposures would be zero risk weighted, one third would attract a 20% risk weight, and another third would attract 100%, suggesting $32bn of RWAs for intraday settlement exposures of $80bn, and $16bn of RWAs for intraday potential future exposures of $39bn.

15 BIS — CRE — Calculation of RWA for credit risk: CRE22 — Standardised approach: Credit risk mitigation
16 BIS — CRE — Calculation of RWA for credit risk: CRE20 — Standardised approach: individual exposures

## How intraday credit exposures may impact future regulation

Additional risk weighted assets of $48bn may not appear material in comparison to the total RWAs held by banks, but when we consider that this estimate was solely for intraday credit exposures arising from securities lending activity, and compare this to total Credit Valuation Adjustment RWAs for the UK banking sector in Q1 2024 of approximately $55bn[17], we appreciate that this is not an insignificant risk.

While it is impossible to predict how future regulations may address intraday credit risk, it is possible that regulators could follow one of three potential paths previously outlined:

I No additional requirements for intraday credit risk: This approach reflects the current regulatory stance. Until recent technological advancements, the ability of counterparties to manage their intraday credit risk without substantially reducing their securities financing activity was very limited. Such a reduction could have a significant negative impact on market liquidity, which could explain why current regulations have not focussed on specific requirements for intraday credit risk.

II Regulatory/Supervisory disclosures: A path used to assess, monitor, and compare the magnitude of exposures. This approach has been taken by many, including the ECB, in relation to climate related financial disclosures, allowing them to collect data and giving them "a basis for taking meaningful and effective action"[18]. Similarly, it would enable regulators and supervisors to track the impact of measures implemented by institutions to mitigate intraday credit risk, using this information to inform future regulatory decisions when these measures are found to be effective.

III Introduce additional capital requirements to cover intraday credit risk: Regulators have taken this approach when risks have been identified as material, or have resulted in a significant risk event in financial markets. With this approach, regulators actively incentivise the use of mitigation measures to reduce risk and therefore capital requirements.

Ultimately, regulators aim to enhance the safety of financial markets by encouraging market participants to effectively manage and mitigate risk, without negatively affecting market liquidity. Advances in technology now enable regulators to achieve these objectives in relation to intraday credit risk, potentially serving as a catalyst for incentivizing market participants to adopt these new technologies.

17 Bank of England — Banking sector regulatory capital — 2024 Q1
18 European Central Bank — Climate-related financial disclosures

# What new technologies bring

## Significant challenges arise when looking for options to mitigate intraday credit risk using currently established technologies and processes.

Intraday credit risk mitigation has two fundamental requirements. Firstly, the ability to move, and more specifically, to synchronize the movement of securities against other securities and cash, and secondly, the ability to do this precisely.

It is possible to move securities relatively quickly today if both parties hold cash and securities accounts at the same custodian. However, it is nigh impossible to pre-determine the time at which settlement will occur. This is driven by several conditions including whether real-time or batch processing is offered by the incumbent custodian as well as whether sufficient securities, cash or credit are available to provision the release of the securities at the time desired.

For securities lending transactions which have separate loan and collateral legs that traditionally have settled at different times, intraday credit risk is often mitigated by instructing both legs versus payment. However, this consumes valuable intraday liquidity, often in the form of credit lines which are also in turn collateralized. Whilst the time differential for a collateral upgrade of same-currency government bonds vs corporate bonds may be minimal, a cross-currency swap of, say, US Treasuries vs Japanese Government Bonds (JGBs) may consume liquidity not only on an intraday but also an overnight basis. This results from the fact JGBs need to be realigned cross-border from the local market and this can naturally only be done during local market operating hours.

The mechanics of this process therefore become not only inefficient but also expensive. Having a common custodian for securities and collateral flows creates an opportunity to mitigate intraday credit risk. However, this is highly dependent on the timing and efficiency of custodian settlement cycles which are often batch driven. There is also a risk that market participants will not be able to optimize inventory efficiently without frictionless collateral mobility thereby leaving assets trapped and sub-optimally financed.

Within existing financial market infrastructure, there are limited solutions to this spaghetti mess. Managing numerous collateral obligations with an inventory of collateral dispersed across different custodians and timezones without greasing the wheels of settlement with buffers of high-quality liquid assets requires a paradigm shift.

New technologies such as Distributed Ledger Technology (DLT) can enable this as part of a digital future.

Instead of trying to consolidate pools of collateral to secure each obligation in a single location, solutions leveraging DLT, such as HQLA$^X$, are able to mobilize pools of securities efficiently without cross-custodian movements.

The ability to achieve "simultaneous handshakes"[19] using either a Delivery vs. Delivery (DvD) or Delivery vs. Payment (DvP) mechanism creates opportunities to exchange ownership of assets instantly, as part of a books and records update, as well as mitigates the risk of creating intraday exposure during the settlement process itself.

In addition to mitigating credit risk, distributed collateral ledgers also solve for a number of additional post-trade risk scenarios.

Firstly, the technology enables synchronised ownership transfers at precise moments in time. Irrespective of whether this is deployed to support securities lending, repo or margin arrangements, it enables settlement to become certain and predictable.

Secondly, firms are able to fully optimize their usage of available inventory irrespective of the deposit location. Margin calls can be met in a timely manner, intraday requirements can be secured without friction & collateral buffers can be minimized.

Finally, as demonstrated in end-to-end tests[20] as well as recent ECB trials[21], DLT solutions are becoming, by design, interoperable. This will enable market participants to create an ecosystem where atomic settlement is supported without restricting freedom of choice.

19 UBS, JD Risk Solutions (2024) — Optimizing Intraday Liquidity Management — Could Distributed Ledger Technology help make T+0 the new normal?
20 Fnality — News & Views — Fnality and HQLA$^X$ complete successful end-to-end testing of cross-chain intraday repo settlement
21 Finadium (4 December 2024) — HQLA$^X$, Clearstream and Eurex Repo facilitate settlement of intraday DvP Repo for Goldman Sachs in ECB trials

# Summary

## The intraday credit exposures generated by securities financing transactions are meaningful and could have a material impact on bank financial resources if regulators introduce capital requirements.

DLT offers technological solutions to address the challenges posed by the current complex and fragmented system of securities ownership records, providing an effective means to reduce risk and enhance efficiency without the need to overhaul existing infrastructure.

While the future regulatory landscape for intraday credit risk remains uncertain, the benefits of Distributed Ledger Technology are accessible to market participants today.

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# Contact information

## HQLA$^X$


### Guido Stroemer
Co-founder and CEO
guido.stroemer@hqla-x.com

### Richard Glen
Solutions Architect
richard.glen@hqla-x.com

hqla-x.com


## JD Risk Solutions


### Dipak Chotai
Managing Director
dipak@jdrisk.co.uk

jdrisk.co.uk