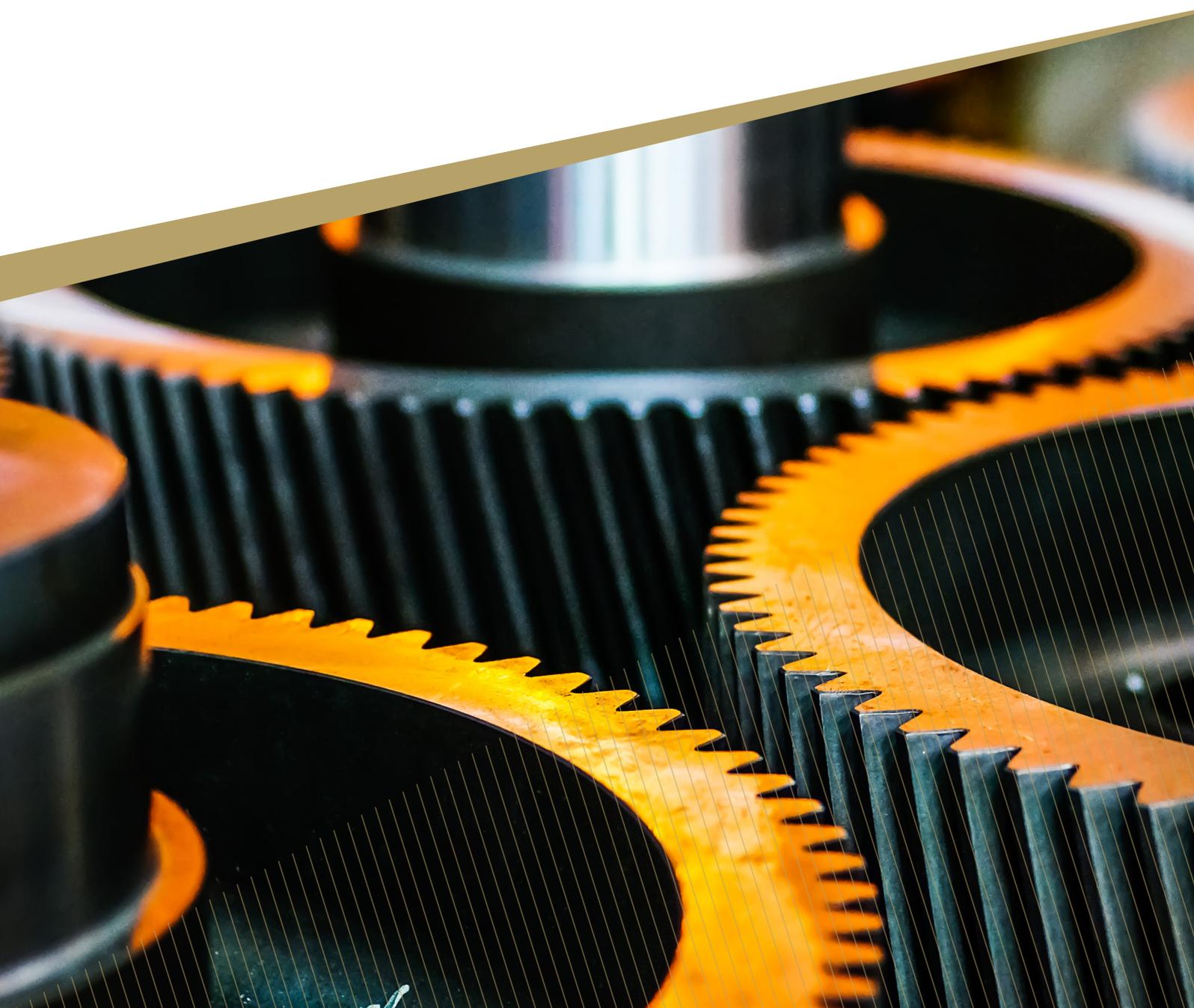


The European Credit Repo Market:

The cornerstone of corporate bond market liquidity

A study into the state and evolution of the
European credit repo market

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Executive summary

The repo market for corporate bonds (the *credit repo market*) is, on many levels, fundamentally different to the larger sovereign bond repo markets. The primary, though not exclusive role, of the credit repo market is to help facilitate the liquidity provision of corporate bond market-makers. Corporate bond market-makers are reliant on a functioning credit repo market, both to fund any long positions that they take onto their books as well as to cover their short sales in order to make good delivery. To the extent that efficient and liquid corporate bond secondary markets are essential in supporting the vital link between corporate capital raisers and investors, the health of the credit repo market plays a direct and critical role.

Banks are very much at the centre of the credit repo market, and the main drivers and facilitators of market activity: principally to support their corporate bond market-making activity, but also as financing liquidity providers to their clients who are active in the corporate bond markets. Bank models tend to vary with respect to credit repo, with some focused purely on financing their bond trading desks, while others are, to different degrees, also focused on servicing clients, while some banks also extend their liquidity provision to competitor banks.

The European credit repo market appears to work well, however, the capacity for the market to function effectively is highly dependent on the supply of corporate bonds into the market. The extent to which buy-side holders are able and willing to lend their holdings back into the market, whether directly or through agent lenders, has a direct bearing on the ability and willingness of banks to support the market-making function that underpins bond market liquidity. For the most part, supply into the European credit repo market is relatively good, particularly with respect to investment grade corporates. And while repo rates for specials, particularly in the high yield space, can be expensive and volatile, there is usually still availability.

The changing nature of the underlying market, with a trend toward smaller trade sizes and more rapid turn-over of dealer positions, is making sourcing supply more difficult. While there may be plenty of bonds in the lending programmes, there is little or no economic incentive to lend small sizes for very short-periods.

Looking forward, the single biggest challenge to supply, and so the health of the credit repo market, is the CSDR mandatory buy-in regime. The overarching market view is that this will have dramatic and potentially devastating consequences for credit repo market liquidity. Quite simply, it is the ultimate deterrent to lending corporate bonds.

While any increase in the cost of capital to support credit repo intermediation has an impact on corporate bond market pricing, the biggest challenge to credit repo intermediation is likely to come from the application of NSFR, which will increase the cost of borrowing corporate bonds significantly. The additional costs of NSFR on credit repo intermediation will need to be passed on to dealers and clients through the repo rates charged, and so ultimately into the pricing of the underlying market. However, there is also a risk that the additional costs of NSFR may result in the reduction in or withdrawal of credit repo desks' services beyond financing their own trading desks.

While ongoing and future challenges to supply and intermediation will ultimately determine the credit repo market's ability to play its pivotal role in supporting corporate bond market liquidity, there would certainly seem to be scope for creating efficiencies through automating many of the highly manual and labour-intensive processes of the market. However, automating the credit repo market is not straightforward, given the intricacies and nuances of the market, with the market becoming even more complex and fragmented with every new layer of regulation.

Introduction

Why this study?

Long before the 2007-08 financial crisis and the ensuing financial regulatory reforms, ICMA was at the forefront of monitoring and analysing both European repo market¹ and corporate bond market² evolution, efficiency, and liquidity. Part of that work, supported by ICMA's various member committees and working groups, has resulted in a number of studies and reports, as well as providing a platform for ongoing engagement and dialogue with policy makers, regulators, and market stakeholders on the important issues of market functioning and liquidity, as well as the unintended consequences and potential risks to market stability arising from the reforms. These reports are also intended to promote a broader awareness and a deeper understanding of the structure, role, and dynamics of these markets.

Vibrant and efficient capital markets play an essential role in connecting individuals' savings and investments with corporates and enterprises that require capital and investment to thrive and grow, creating jobs, sustaining economic growth, and underpinning financial stability. Corporate bond markets can play a critical part in mobilising and optimising capital,³ something that is very much at the heart of the European Commission's Action Plan for Capital Markets Union.⁴

ICMA has for a long time advocated that an effective and efficient capital market relies not only on the mechanisms for capital raisers to connect with investors, but that a deep and liquid secondary market for securities is a vital component of this equation; something that is increasingly acknowledged by policy makers and regulators.⁵ What also becomes clear is that the health and efficiency of these markets is very much interconnected with ancillary hedging and financing markets. In the case of corporate bond markets, these are the single-name credit default swap (SN-CDS) market and the credit repo market.

This study builds on ICMA's previous work with respect to both corporate bond market⁶ and repo market evolution and liquidity,⁷ and attempts to investigate the European credit repo market from the perspective of its role, structure, participants, dynamics, external impacts, challenges, opportunities, and potential evolution, particularly to the extent that this plays a pivotal role in overall corporate bond market liquidity. Accordingly, there is no underlying hypothesis with respect to market functioning or liquidity; rather this is simply an attempt to understand the market, and to tell its story.

Scope and methodology

The objective of this study is to explore and map the state and evolution of the European credit repo market, focusing specifically on: (i) market structure (including the role of the market and the participants); and (ii) market dynamics (including how liquidity is created, and the forces affecting and shaping the market).

Scope

The scope of the study is an examination of both the general collateral (GC) funding market and specifics (or specials)⁸ market for corporate bonds with respect to:

- a) European issued investment grade, high yield, distressed, and hybrid debt
- b) Non-financials and financials
- c) EUR, GBP, USD denominated debt, and other currencies issued in the European market

While the focus is primarily on financial and non-financial corporate bonds, it should be borne in mind that many credit repo desks often have a wider remit which could extend to other classes of non-sovereign debt.

1 ICMA's work related to European repo and collateral markets is led by the [European Repo and Collateral Council \(ERCC\)](#) and Committee

2 ICMA's work related to European corporate bond secondary markets is led by the [Secondary Market Practices Committee \(SMPC\)](#)

3 See [Economic Importance of the Corporate Bond Markets](#), ICMA, 2013

4 [Action Plan on Building a Capital Markets Union](#), European Commission, 2015

5 For example, [Examination of Liquidity of the Secondary Corporate Bond Markets](#), IOSCO, 2017

6 See [Remaking the corporate bond market](#), ICMA, 2016, and [The current state and future evolution of the European investment grade corporate bond secondary market: perspectives from the market](#), ICMA, 2014

7 See [Perspective from the eye of the storm: the current state and future evolution of the European repo market](#), ICMA, 2015

8 The term 'special' is often used interchangeably with the term 'specific', referring to the loan or borrow of an individual specific bond. However, the term 'special' is also often used to refer to a specific bond where the repo or lending rate is relatively expensive compared to similar specific issues.

It should also be noted that while the term 'credit repo' is used extensively with respect to corporate bond financing markets, this also covers securities lending agreements as well as repurchase agreements.

Methodology

There is very little public data available related to activity in the European credit repo market, however, as much as possible, ICMA has attempted to source public or private data that help to illustrate the size and nature of the market, particularly with respect to trends.

However, given that this is mainly an attempt to describe qualitatively the market structure and dynamics, the main source of information is provided through interviews with market participants. In total 24 separate interviews were conducted, involving more than 30 individuals, representing the following key stakeholders:

- Banks' credit repo desks and sell-side liquidity providers
- Buy-side users of the market (both real money and leveraged)
- Agent lenders
- Inter-dealer brokers
- Market infrastructure providers, including trading platforms

The firms that participated in or contributed to this report are listed in the Acknowledgments.

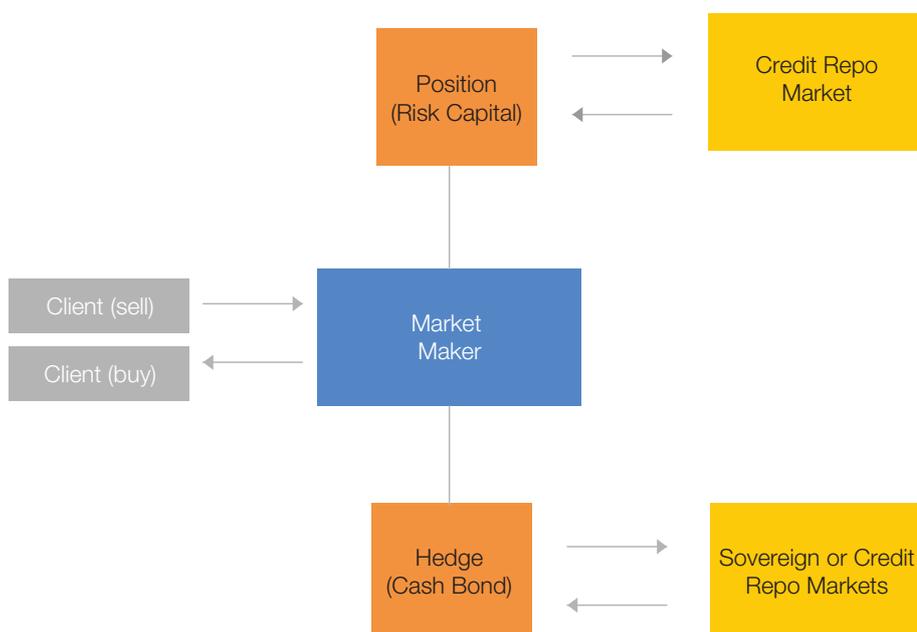
Chapter I: Market structure

The role of the credit repo market

The repo market for corporate bonds (the *credit repo market*) is, on many levels, fundamentally different to the larger sovereign bond repo markets. While the sovereign bond repo markets serve multiple roles, such as being the main means of mobilising high quality liquid assets (HQLA) for collateralising secured funding transactions and margin, and as the means through which central banks manage reserves and transmit monetary policy, the primary role of the credit repo market is to help facilitate the liquidity provision of corporate bond market-makers. Corporate bond market-makers are reliant on a functioning credit repo market, both to fund any long positions that they take onto their books (mostly *general collateral*, or 'GC' financing) as well as to cover their short sales in order to make delivery (*specifics* financing). Since these financing costs are a key component of dealers' bid-ask spreads, as well as the ability to access financing markets being a prerequisite for liquidity provision, secondary corporate bond market liquidity and pricing are directly impacted by the relative functioning and liquidity conditions of the credit repo market.

To the extent that market-makers also use government or corporate bonds to hedge their interest rate risk, access to, and conditions in, the sovereign repo market, as well as the credit repo market, will also impact liquidity and pricing in the corporate bond secondary market (since hedging costs are a further component of the bid-ask spread). Box 1 illustrates in more detail the importance of repo markets to the market-making function.

Figure 1: corporate bond market liquidity provision and the repo market



Box 1: Corporate bond market liquidity - the central role of market-making

Traditionally, the main source of secondary market liquidity for corporate bonds (as with most fixed income markets) is through the market-making model. Unlike more homogenous or standardised markets, such as listed equities or financial futures, corporate bonds are broadly heterogenous (one issuer may have hundreds of different lines of bonds) and highly illiquid (after the initial few days following issuance, many corporate bonds may not trade again for weeks, or even months). Thus, corporate bonds do not naturally lend themselves to exchange-based trading.

For investors to be able to transact in corporate bonds, whether as sellers or buyers, it is generally impractical to search for an investor with a matching interest who might take the other side of the trade; and it could potentially take weeks, or even longer, to find just one matching interest. Instead, investors rely on the services of market-makers to provide bids or offers as required. Accordingly, market-makers are the primary source of market liquidity and price immediacy in corporate bond markets.

While market-makers may not necessarily run large inventories of the bonds for which they are dedicated liquidity providers (and are less likely to do so in recent years due to the increased cost of regulatory capital), they are nonetheless (usually) willing to provide bids or offers to their clients on request. If the client chooses to transact, the market-maker, acting as principal to the trade, will take the position onto their own trading book: going long the bonds in the case of a client sale, and going short the bonds in the case of a client purchase. The market-maker will then finance and hedge the position, managing any associated risk, until she is able to trade out of the position: selling the long, or buying-back the short, usually transacting with either another client or another broker-dealer, and potentially days or weeks after taking the original position.

The ability of the market-maker to offer this liquidity, as well as to provide efficient and competitive pricing to their clients, relies very much on their ability both to finance and hedge the positions they take onto their trading books (as well as the balance sheet capacity to hold the position). From a financing perspective, the market-maker will rely on their repo desk to repo-out (lend) any long positions, and to reverse-in (borrow) bonds against any short positions in order to make good delivery on the sale. The more efficient and liquid the repo market, the more confident the market-maker is to provide liquidity, and the better able to show competitive pricing (since the anticipated financing costs will form part of the bid-ask spread).

With respect to hedging, credit traders must manage two distinctive risks: interest rate risk and credit risk. The former is generally neutralised by spreading corporate bonds against a sovereign bond benchmark (usually the sovereign debt of the issuance currency, and the bond with the closest maturity). In this case, they will also rely on the sovereign bond repo market to fund the short or long hedge. Alternatively, the market-maker could use a sovereign bond future or an interest rate swap (IRS) to hedge the interest rate risk, however this will expose them to additional basis risk.

In terms of the credit risk (i.e. the risk specific to the possibility of default of the bond), market-makers may look to use the single name credit default swap (SN-CDS) market, selling or buying protection with respect to the issuer and debt seniority of the bond they are hedging. However, given that there may not be sufficient liquidity in this market, they may instead elect to use a CDS index as a proxy credit hedge. Alternatively, they may choose to hedge the credit risk (and the interest rate risk) by spreading the position against another corporate bond: usually the same credit (issuer) and seniority, or, potentially, the same issuer but another part of the capital structure (e.g. senior versus subordinated tranches). Again, where the market-maker hedges using another bond sale or purchase, they will be reliant on access to the repo market in order to facilitate the hedge.

What do we mean by the credit repo market?

The credit repo market is generally taken to cover **both** the repo and securities lending markets⁹ for corporate bonds (financial and non-financial), both investment grade and sub-investment grade (or *high yield*). Depending on the particular structure of bank credit repo desks, this remit could be extended to include covered bonds, asset backed securities (ABS), supranationals, agencies, quasi-sovereign emerging market (EM) issuers, as well as convertible bonds.

While credit repo desks tend to be generalists in terms of the underlying collateral and positions that they manage, liquidity and pricing in the repo market will usually correlate closely with that of the underlying cash bond markets. In particular, there tends to be a notable distinction between financials and non-financials (and between senior and subordinated within bank financials), as well as between investment grade (IG) and high yield (HY) corporates. Further delineation could be made between ECB-eligible¹⁰ IG bonds and non-ECB-eligible, as well as higher rated HY (*cross-over*) and un-rated or distressed debt.

Market participants

Banks are very much at the centre of the credit repo market, and the main drivers and facilitators of market activity, principally to support their corporate bond market-making activity, but also as financing liquidity providers to their clients who are active in the corporate bond markets. Bank models tend to vary with respect to credit repo (see Chapter II), with some focused purely on financing their bond trading desks, while others are, to different degrees, also focused on servicing clients (providing both GC and specific financing), while some banks also extend their liquidity provision to the street (i.e. competitor banks). Where banks borrow from or lend into the street this is often intermediated through an inter-dealer broker (IDB).

Chief among banks' credit repo clients are hedge funds, who, similar to market-making desks, are reliant on credit repo desks to fund their longs and cover their shorts. In some instances, either or both of long financing and short covering might be facilitated through the financing platforms of the hedge funds' prime brokers (PB), or directly through the credit repo market, using a range of banks with whom they are not necessarily '*PB-ed*'.

Real money investment funds (IFs), such as pension funds and mutual funds, are also critical participants in the credit repo market, not least since they are the main holders of, and the principal source of, supply for corporate bonds. Some larger funds may lend directly to the market, while others lend through agent lenders (see Box 2). These agent lenders are usually custodian banks or asset managers, but can also be the central securities depository (CSD) where the securities are held. Whilst agent lenders are generally the main source of specifics, they can also play a role in the GC market, either lending or borrowing corporate bonds (usually through a triparty transaction) as part of a *collateral transformation transaction* (see Box 4), or reinvesting cash from their general lending activity.

Other lenders of short-term money, such as money market funds (MMFs) or corporate treasuries may also invest in the credit repo GC market, again mainly via triparty transactions.

Recently, central banks have become active in the credit repo markets as a result of monetary policy. The ECB will take a range of eligible investment grade corporate bonds in its refinancing operations, while, as a result of extending quantitative easing (QE) to include corporate bonds, the various national central bank (NCB) lending programs also include bonds purchased as part of QE (see Chapter II).

Of note, unlike the sovereign bond repo market, the credit repo market is not yet clearable through central clearing counterparties (CCPs), and it is very much a non-cleared, OTC, bilaterally transacted market.

How the market is structured

The credit repo market can largely be divided into two distinct activities: long financing (*GC*) and short covering (*specifics*). Across many banks these two distinct activities are often separated into different functions, with the

⁹ Securities lending transactions for corporate bonds can be either versus cash (similar to a repo) or versus collateral (usually sovereign bonds or high quality triparty sets). Due to regulatory pressures on balance sheet there is a trend toward collateral versus collateral securities lending rather than reverse repos (this is discussed more in Chapter II).

¹⁰ ECB-eligible refers to collateral that is acceptable in the ECB's short-term and long-term refinancing (repo) operations.

credit repo team focused on borrowing or lending specific bonds, while the GC traders, collateral management team, or bank treasury manage the long funding.¹¹

Specifics

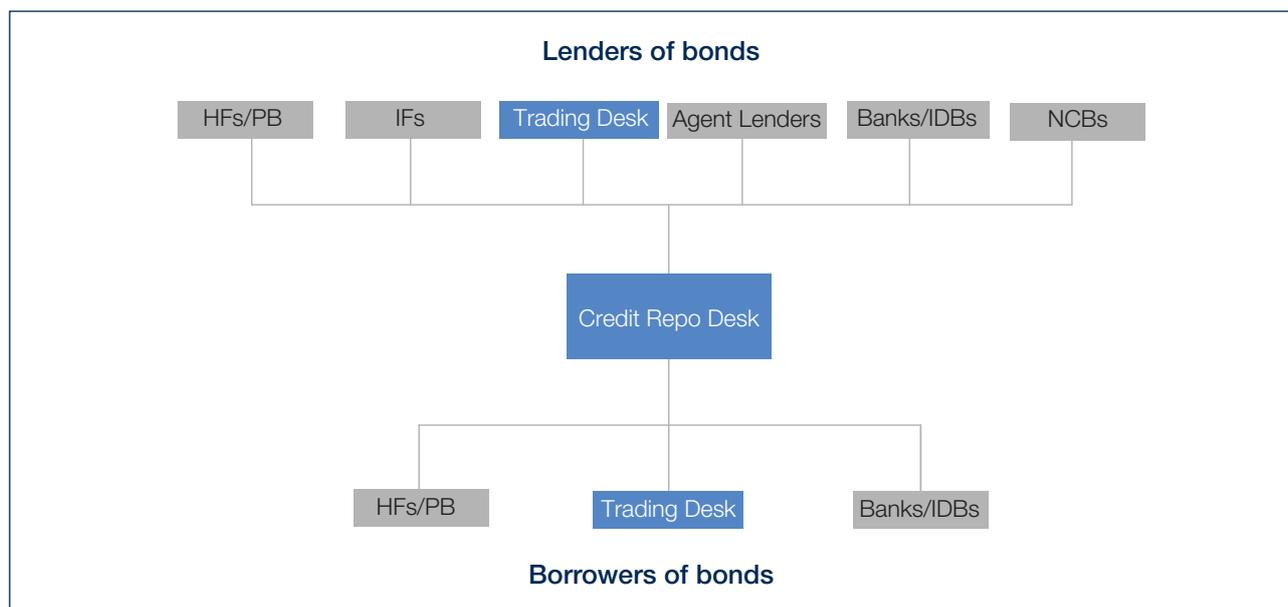
Specifics (sometimes referred to as 'specials') are generally loaned and borrowed on an *open* basis. Essentially this gives the lender the right to recall the bonds (and terminate the repo or loan) at any time with 24 hours' notice, and, similarly, the borrower can end the trade and return the bonds, also with 24 hours' notice. This flexibility also allows both lender and borrower to negotiate *re-rates* (i.e. changing the current repo rate or fee from the next day), should the repo market for the relevant bond tighten or cheapen. While term trades for specifics are possible, these are virtually non-existent in the current market (see Chapter II).

Figure 2 illustrates the main market participants active in lending and borrowing corporate bond specifics.

The demand for specifics invariably is driven by short-selling. Usually the reverse repo (or borrow) takes place after the short is initiated, either by the cash bond trading desk or client, although often it can be in the form of a *pre-borrow*, to ensure that the repo is in place before the short sale is executed. In some cases specifics may even be borrowed against a long sale in order to hedge settlement risk, say in the instance where the long position is repo-ed out, and there is a risk of the recall failing.

Specifics will usually trade at a premium to general funding levels (which also provides an incentive for real money holders to lend bonds), with the rate being driven by repo demand and supply for that specific issue.

Figure 2: European credit repo market structure for specifics (short covering)



General Collateral

While many corporate bonds are loaned as specifics (which commands a premium to the general financing rates), most corporate bonds are loaned in the form of general collateral. In some cases this can be similar to the sovereign bond GC market, trading as a specified (ISIN level) GC line, or lines, for an agreed term. However, the significant majority of corporate bond funding is through triparty structures, which allows the funder both efficiency and flexibility in managing the financing of a constantly changing inventory of bonds (see Box 3). For short-term cash investors, non-sovereign and lower-rated triparty sets provide the opportunity to earn higher returns compared to the core sovereign GC repo market.

As discussed more in Chapter II, triparty structures further allow banks to manage their regulatory obligations under the Liquidity Coverage Ratio (LCR), using term repos or *evergreen* structures to extend the maturity profile of their short-term funding. LCR, as well as the need to optimise balance sheet under Leverage Ratio (LR) requirements,

¹¹ In many respects, this is not dissimilar to the classic repo trading desk model for sovereign bond repo, which often consists of GC traders (focused primarily on managing short-term interest rate risk), and specials traders (whose primary focus is the relative value and repo premium of 'in-play' bonds).

has also given rise to the so-called *collateral transformation* trade. In fact, this is not 'transformation' at all; rather it is the simultaneous repo/loan and reverse/borrow of baskets of securities, or triparty sets, with different credit ratings. This allows banks the opportunity not only to fund their relatively low rated corporate bond inventory, but also to switch these holdings into HQLA assets (the *collateral upgrade*), for a fee.¹² Meanwhile, investors, or their agent lenders on their behalf, are able to make additional returns on their sovereign bond or other HQLA holdings by taking the other side of this trade (the *collateral downgrade*).

Figure 3: European credit repo market structure for GC (long financing)

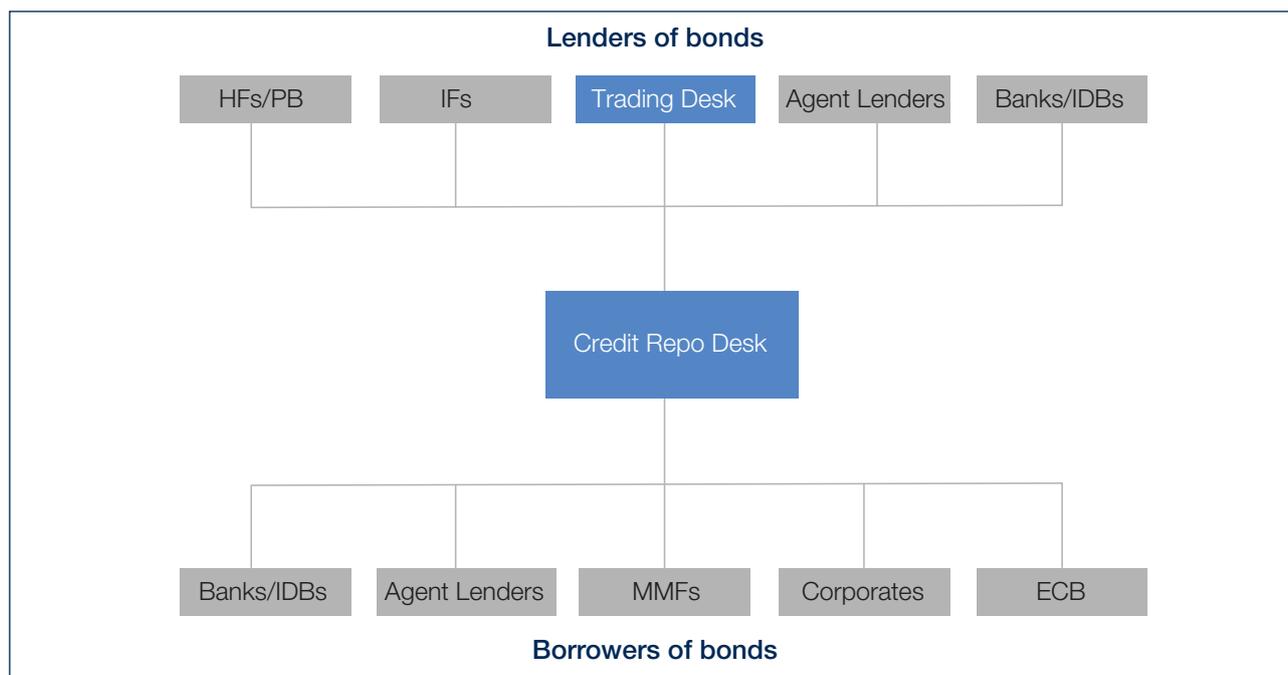
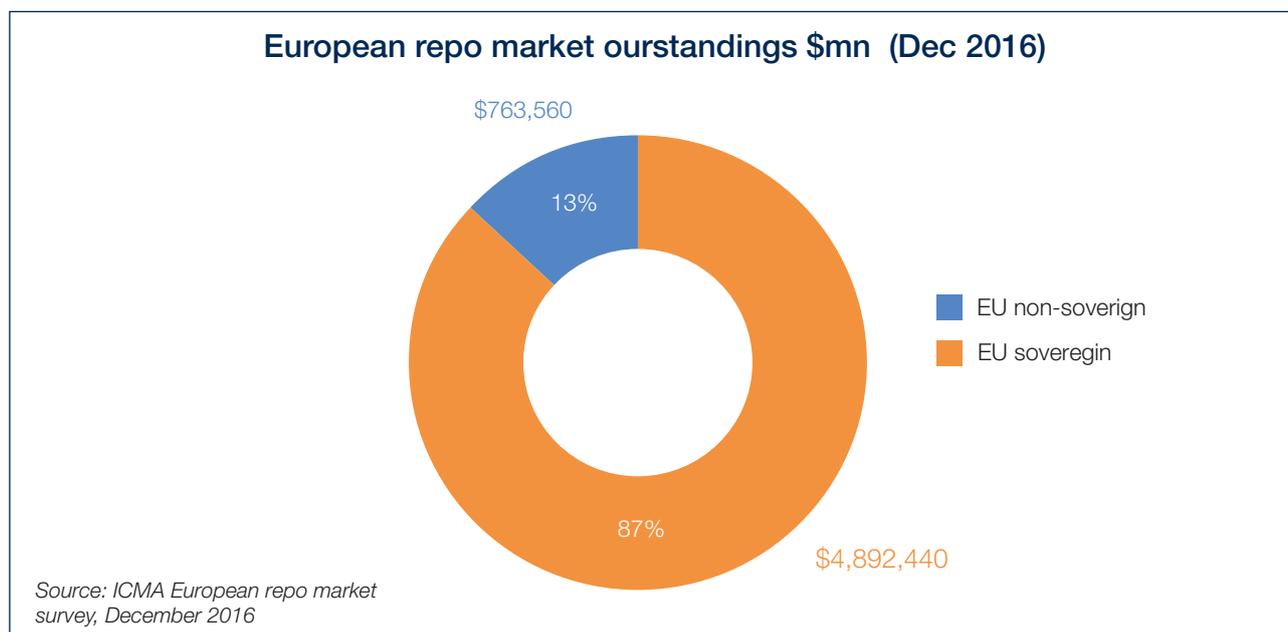


Figure 4 provides an estimate of the size of the European credit repo market based on the ICMA European repo market survey. The survey suggests that it is around \$763bn, measured as reverses (or around 13% of the total European repo market). However, this does not capture securities lending transactions, which are a significant part of the market (see Figure 8).

Figure 4: relative size of European non-sovereign repo market



¹² In the case of securities lending transactions (collateral versus collateral) this will be an explicit fee, while in the case of repo versus reverse repo the effective 'fee' will be the difference between the repo rates.

There is not a great deal of data available with respect to traded volumes in the European credit repo market, however volumes in the underlying corporate bond markets should provide a relative guide. Figure 5 suggests a decrease in overall activity, post crisis, but an uptick in volumes over the past twelve months. Figure 6 helps to illustrate the heterogeneity of the corporate bond market. Despite being 13% the size of the euro sovereign market in terms of volumes, the number of traded ISINs in the euro corporate bond market is eight-times that of the government bond market.

Figure 5: underlying corporate bond market activity (relative to government bonds)

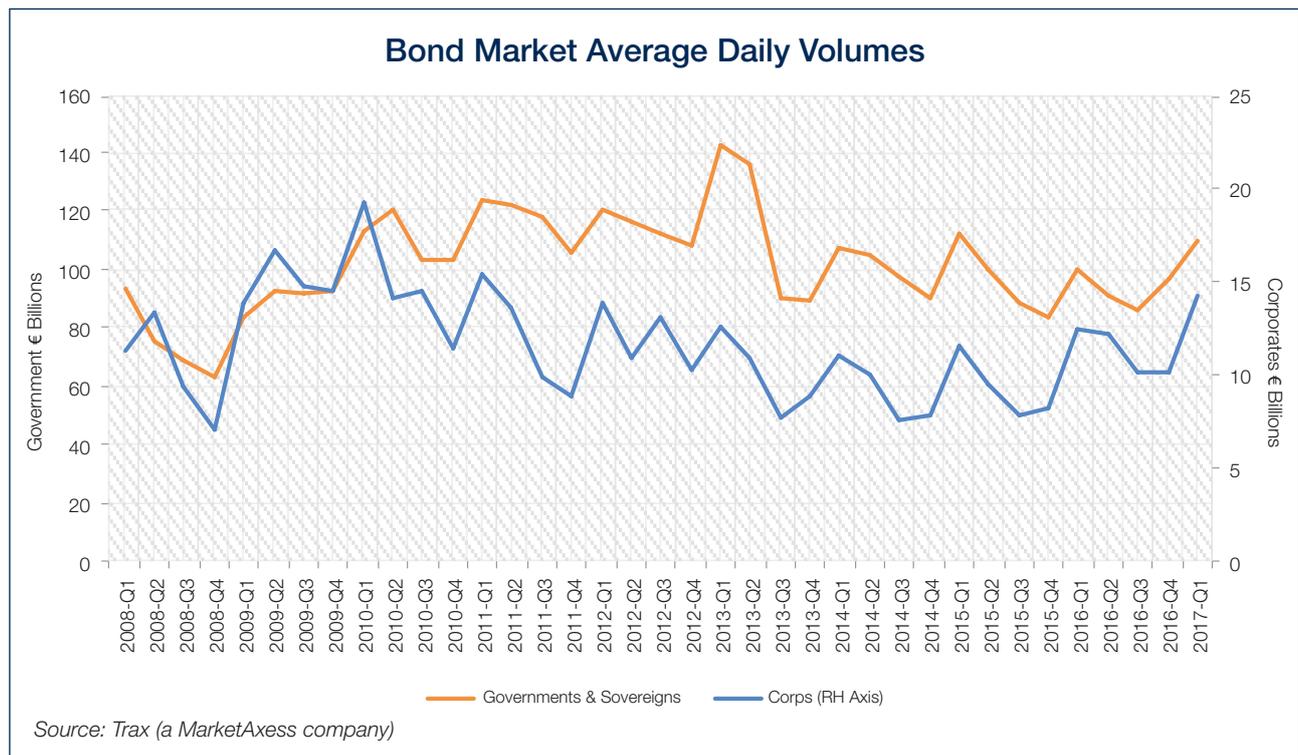
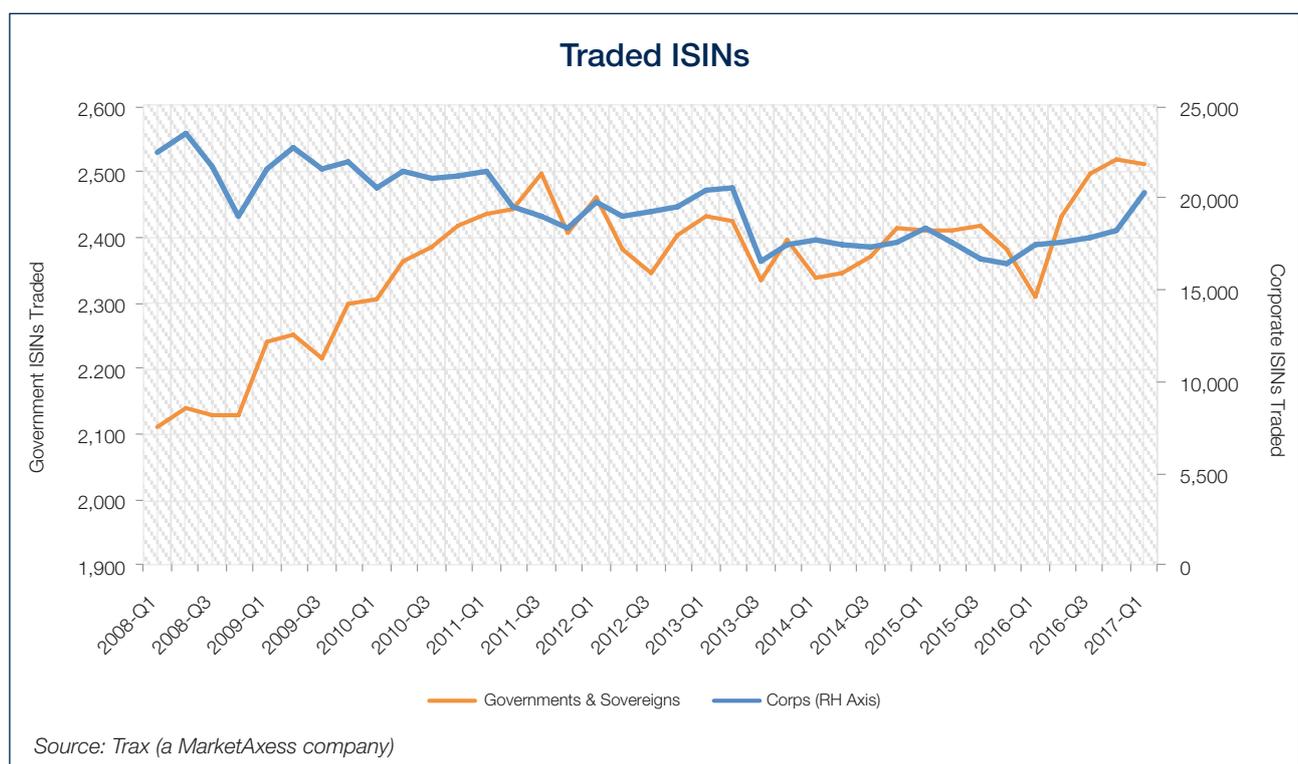


Figure 6: underlying market activity ISIN count (relative to government bonds)



Box 2: Agent Lenders

Holders of corporate bonds (and other securities) are able to earn incremental returns on their holdings by lending them into the repo or securities lending markets where there is demand to borrow the securities they are holding. While the largest investment funds may be able to do this directly, having their own repo and lending agreements with one or more banks, many funds elect to do this through agent lenders, who manage the lending of their securities on their behalf. In most cases this will be a custodian bank (that holds their securities) or their asset manager. In some cases, this could also be the central securities depository (CSD) where the securities are held, or a specialist firm.

The holder of the securities will enter into a legal agreement with the agent lender, which sets out the terms and parameters for the lending program, as well as the allocation of fees or returns earned from lending. Importantly, the beneficial owner (lender) retains the economic risks and benefits of the loaned securities, and while they have the right to recall any loan under the terms of the agreement, say in the case that they sell the position being loaned, they are generally exposed to any losses that may result in the case that the securities are not returned in time to make delivery on the sale (normally it is the agent that is responsible for managing the recall in the case of a sale). Under some agreements the agent will provide indemnity for the lender in the case of certain eventualities, such as the borrower defaulting and any haircut or collateral not being sufficient to cover the cost of replacing the securities.

There are a variety of different agent lending agreements. In some cases the borrower will be transacting directly with the agent themselves, while under other arrangements they will be transacting with the underlying fund.

Box 3: Triparty repo

Triparty repo is a transaction for which post-trade processing during the life of the transaction – collateral selection, payment and settlement, custody, and management – is outsourced by the trading parties to a third-party agent. Triparty agents are generally ICSDs or custodian banks. In Europe, the principal triparty agents are Clearstream Luxembourg, Euroclear Bank, Bank of New York Mellon, JP Morgan, and SIX SIS,

Because a triparty agent is just an agent, use of a triparty service does not change the relationship between the parties, as the agent does not participate in the risk of transactions. If one of the parties defaults, the impact still falls entirely on the other party. This means that parties to triparty repo need to continue to sign bilateral written legal agreements such as the GMRA or GMSLA.

Once a transaction has been agreed - usually by telephone or electronic messaging - both parties independently notify the tri-party agent, who matches the instructions and processes the transaction. The agent will automatically select, from the securities account of the seller, sufficient collateral that satisfies the credit and liquidity criteria, as well as any concentration limits pre-set by the buyer. The selected collateral will be delivered against simultaneous payment of cash from the account of the buyer, subject to initial margins pre-specified by the buyer. Subsequently, the triparty agent manages the regular revaluation of the collateral, margining, income payments on the collateral, as well as (in the case of most European triparty agents) substitution of any collateral which ceases to conform to the quality criteria of the buyer.

Triparty transactions are generally based on pre-agreed collateral 'sets' (or criteria), supported by the triparty agents. These sets will explicitly include (or exclude) certain asset types, credits, maturities, and credit ratings, among other factors. They may also outline concentration limits, again based on the same considerations related to asset type and credit.

Chapter II: Market dynamics

Creating liquidity: market models

Broker-dealer banks are the engine of the credit repo market, with demand and supply being generated by the market-making activity of their credit trading desks, as well as acting as principal intermediaries to finance their clients' positions. What becomes clear, however, is that there is no standardised business model for a credit repo desk, and virtually every bank is different in the way it interacts with the market. The differences could best be described by viewing business models along three axes.

Internal funding vs client funding

A number of credit repo desks are primarily, and in some cases exclusively, focused on servicing their 'internal franchise', namely their cash bond credit trading desks (market-makers). The focus is mainly on covering their traders' short positions, although some desks also manage the financing of traders' long positions. Other desks, to varying degrees, also provide credit repo liquidity to their client base, primarily hedge funds, who require bank financing for their long and short positions. In this case the banks utilise balance sheet and capital, running so called 'matched-books', where they act as principal intermediary in matching supply and demand. Again, these desks may be either more specific or GC focused, or both, acting as intermediary between lenders and borrowers.

The focus of banks with respect to credit repo operations can also play a role in how the credit repo function sits within the financing and collateral management structure. In many cases the credit repo book will be part of the general repo desk, while in some instances it is a stand-alone function, with a dedicated credit repo team. In a few cases, the credit repo function is aligned more closely with the equity securities lending desks and sits within the bank's prime brokerage division, rather than on the fixed income or credit trading floor.¹³

Specifics vs GC

As already discussed, there is often a clear distinction between corporate bond specifics and GC trading with respect to bank repo desk structures. Many credit repo desks are exclusively focused on borrowing and lending specifics, whether to service their own trading desks, their clients, or trading with the street, while the financing of long positions tends to be delegated to the GC trading, collateral management, or treasury functions. However, some credit repo desks, are more focused on trading GC, particularly providing term financing for clients against their long positions. It is pointed out by respondents that specifics, which tend to come with wider margins, provide a greater return on balance sheet than more balance sheet heavy GC trading, where spreads are much tighter (and sizes larger), and so balance sheet availability and return-on-capital hurdles also play an important consideration in terms of whether credit repo operations are more specifics or GC focused.¹⁴ Hedge funds, for instance, report prioritizing different counterparty banks based on whether they are looking to borrow or lend specifics, or whether they are looking for term GC financing.

Interaction with the street vs franchise only

While the interbank market is perhaps not as significant for credit repo as for sovereign repo, it is still an important part of the ecosystem, and for many a major source of liquidity. However, bank models vary with respect to their interaction with or dependence on 'the street'. Some banks, for instance, report that they intentionally try to avoid borrowing or lending to the street, whether for specifics or GC, trying to create exclusive franchise models, often only resorting to the interbank market as a last resort. Other banks, however, see the street as a main source of flow for their business. For example, desks that run large matched-books in specifics tend to be large lenders to the street, while smaller, less franchise orientated desks that are focused more on financing their internal franchise, may use the street as their main source of supply for specifics.

The interbank market also supports term GC trading, although many note to a lesser degree as capital constraints have reduced this activity. The interviews also suggested that active players tend not so much to be the larger broker-dealers, but usually these are more likely to be commercial banks, and often based in jurisdictions with less conservative capital or leverage ratios. Also, the underlying collateral tends to be at the very high end of the credit spectrum, and often supranational or quasi-sovereign issues, rather than true corporate bonds. Another observed trend in the interbank GC market is that more frequently trades are transacted as collateral swaps (simultaneously

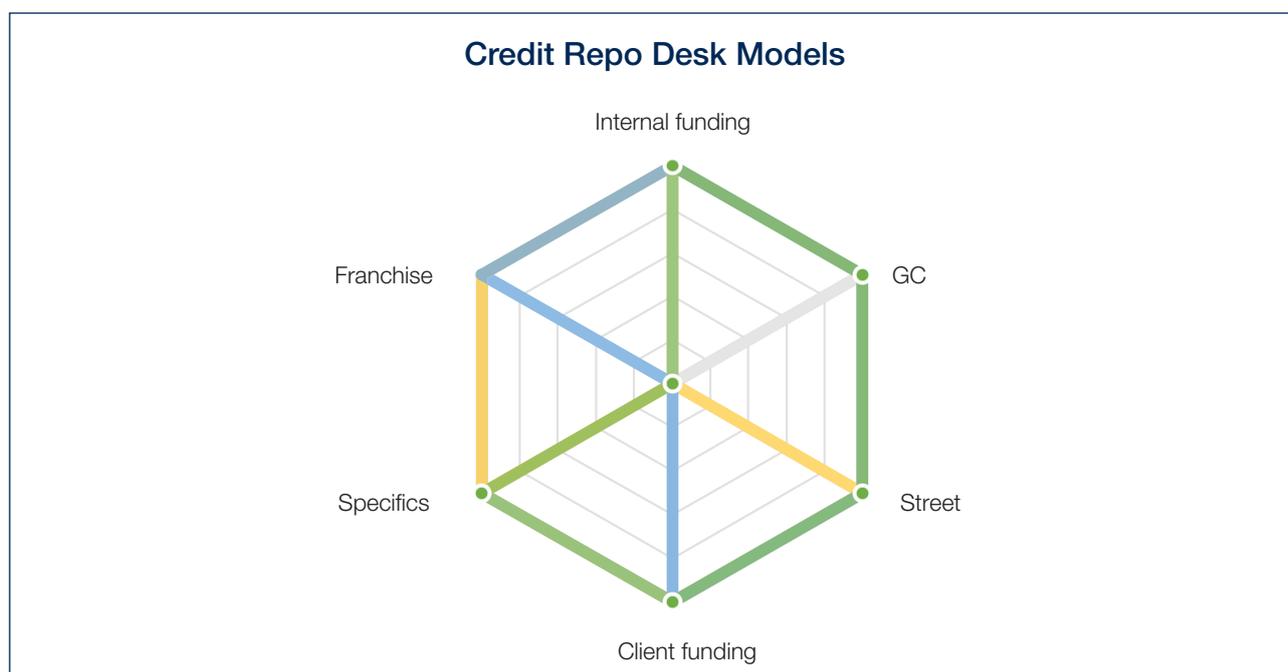
¹³ This is very much how the US market is structured, with corporate bond financing being part of the PB securities lending function.

¹⁴ Unlike sovereign repo, most corporate bonds are not eligible for clearing through CCPs, which also reduces the scope for balance sheet netting opportunities.

repo and reverse repo between the counterparties), normally as a collateral transformation trade (see Box 4) with one leg likely to be in high quality collateral such as US treasuries.

An important component of the interbank market is the inter dealer brokers (IDBs), who match borrower and lender interests, both for specifics and GC. This is very much a 'voice-brokered' market (including the significant use of electronic messaging – primarily through Bloomberg), as the bespoke nature of the market does not lend itself easily to screen trading. The reduction in credit repo trading activity has seen the withdrawal or downsizing of some credit repo IDBs, however, a number remain highly active, with, again, some tending to focus more on GC (fewer trades, but larger underlying value) and others on specifics (smaller underlying value, but higher turnover). Furthermore, IDBs are seen as one of the few reference points for price discovery in the credit repo market, particularly with respect to specials.

Figure 7: mapping the diversity of the credit repo desk model



Demand, supply, and pricing

Specifics: demand

Demand for specific bonds is very much correlated to activity in the underlying credit markets, and is driven primarily by market-makers short-selling as a function of their liquidity provision to clients, as well as by hedge funds who short-sell corporate bonds as part of their relative value trading strategies. A commonly reported trend is that while demand driven by dealers remains relatively active, the tendency is for these shorts to be covered (i.e. bought back) relatively quickly, often within a few days. This seems to be a result of a change in underlying trading strategies, where dealers are focused on higher turnover of positions, primarily due to balance sheet constraints.

A second commonly noted trend is that dealer positions have become a lot smaller. This is largely attributed to the rise of electronic trading, which has a tendency to engender more retail sized trades, as well as a decline in liquidity in the underlying market which is leading to a propensity for fund managers 'slicing and dicing' their orders, rather than looking to complete transactions in one block trade. As one repo trader explained, whereas a few years ago it was relatively normal for a dealer's book to consist of just a few short positions, but each one around 25-50 million, now they are more likely to run tens, if not hundreds of shorts, but many of them in shapes of less than 1 million. Other factors cited as contributing to the increase in 'odd-lot' shorts on dealers' books are periodic portfolio rebalancing by asset managers, as well as the rise in popularity of the corporate bond ETFs, which requires long and short positioning by the approved participants to proxy the underlying ETF baskets, but which also drives smaller positions, since ETFs are based on an index rather than a specific credit.

In terms of hedge fund activity, it is noted by many interviewees that this has reduced significantly in recent years, particularly in the IG space. This is mostly attributed to the dramatic spread compression for IG, being driven by the low interest rate environment, the reach for yield by real-money investors, and, more recently, central bank corporate bond purchases. Where hedge funds tend to be most active in credit is in the HY space, where there is still some volatility and with this relative value opportunities, particularly with respect to other parts of a credit's capital structure (such as bank loans or equity), or in the highly specialized distressed debt space. However, it is clear that this important dynamic for the credit repo market is far less central today than it was pre-crisis.

Specifics: supply

As discussed in Chapter 1, the main source of supply for corporate bond loans and repo is the agent lenders, who are usually the first port of call for the credit repo desks that are looking to cover their inhouse shorts or those of their clients. It would seem that most specifics are borrowed directly or indirectly from the agent lenders, particularly with respect to IG. However, this appears to become more difficult with respect to HY, where underlying holders may be less inclined to put their positions into agent lending programs. Agent lenders also report that demand for specific corporate bonds, while still healthy, has become a much smaller part of their overall business, particularly compared to the increasing demand for sovereign bonds, either as specifics or as part of collateral transformation trades.

As also mentioned, some asset managers and investment funds will lend specifics out of their portfolios. In some cases, borrowing a protocol from the equity securities lending world, credit repo desks may pay a fee to have exclusive access to corporate bond portfolios, allowing them to help themselves to any of the underlying bonds as needed. The value of an 'exclusive' is very much dependent on the constituent bonds, as well as frequency of turnover, and in most cases, credit repo desks that do agree exclusives tend to do so with respect to high yield portfolios.

Figure 8: value of EU corporate bonds on loan

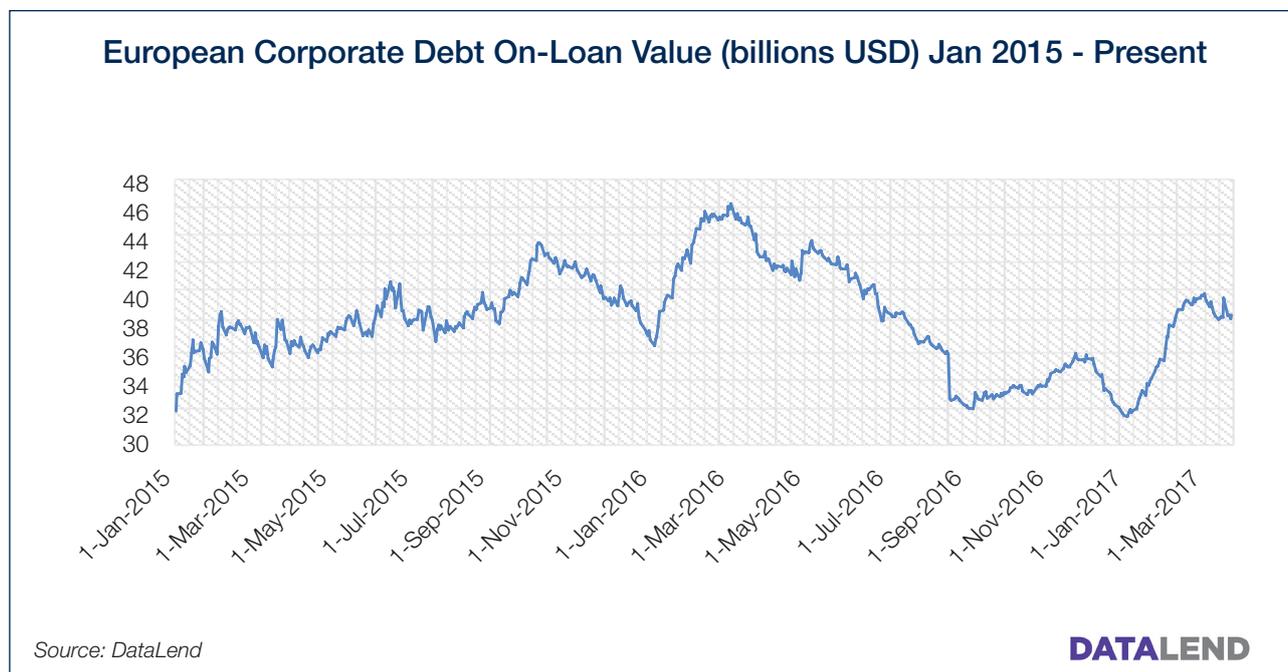
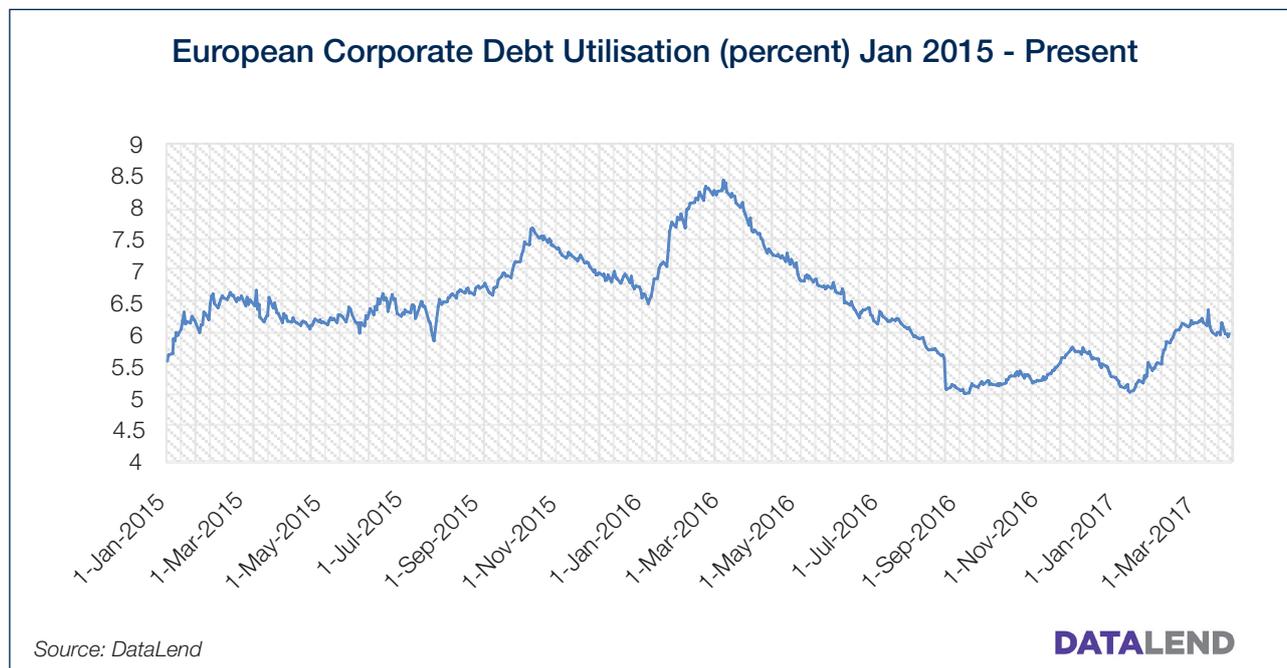


Figure 9: lender utilisation rate of EU corporate bonds available to lend

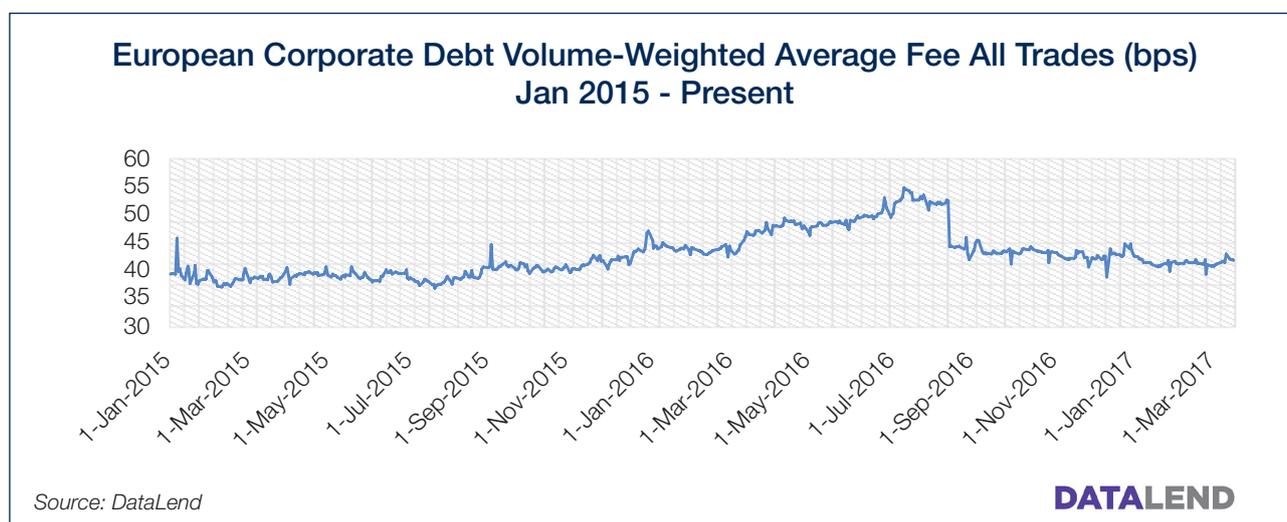


Specifics: pricing

The general rule of thumb for pricing specifics that are not on special seems to be somewhere in the range of 20-35bp through GC rates for IG, and 50-100bp through GC for HY, which is relatively more expensive than sovereign specifics (that may only be a few bps through GC). As some repo traders were keen to note, the credit repo market is probably the only part of the repo market that fully prices-in the true cost of doing business (at least with respect to specifics). However, supply is a critical factor in the credit repo market, given relatively small underlying issue sizes, and often restricted supply from end holders. Accordingly, when demand increases, say due to a large client (or central bank) purchase, or crowding into a particular short position (say due to a credit event), rates can tighten quickly and significantly, and usually in the form of 'gapping', rather than incremental moves. This is particularly the case with HY, where issue sizes and relative supply tend to be smaller, and where holders are inclined to withdraw supply quickly if they feel that this is fueling adverse price moves.

Thus, when specifics do 'go special' the moves can be dramatic. For example, it is reported that it is not unusual for IG bonds to trade 100-200bp through GC, while HY bonds can easily trade 500-700bp, or even tighter, through GC.

Figure 10: average weighted fee of EU corporate bonds on loan



Re-rates

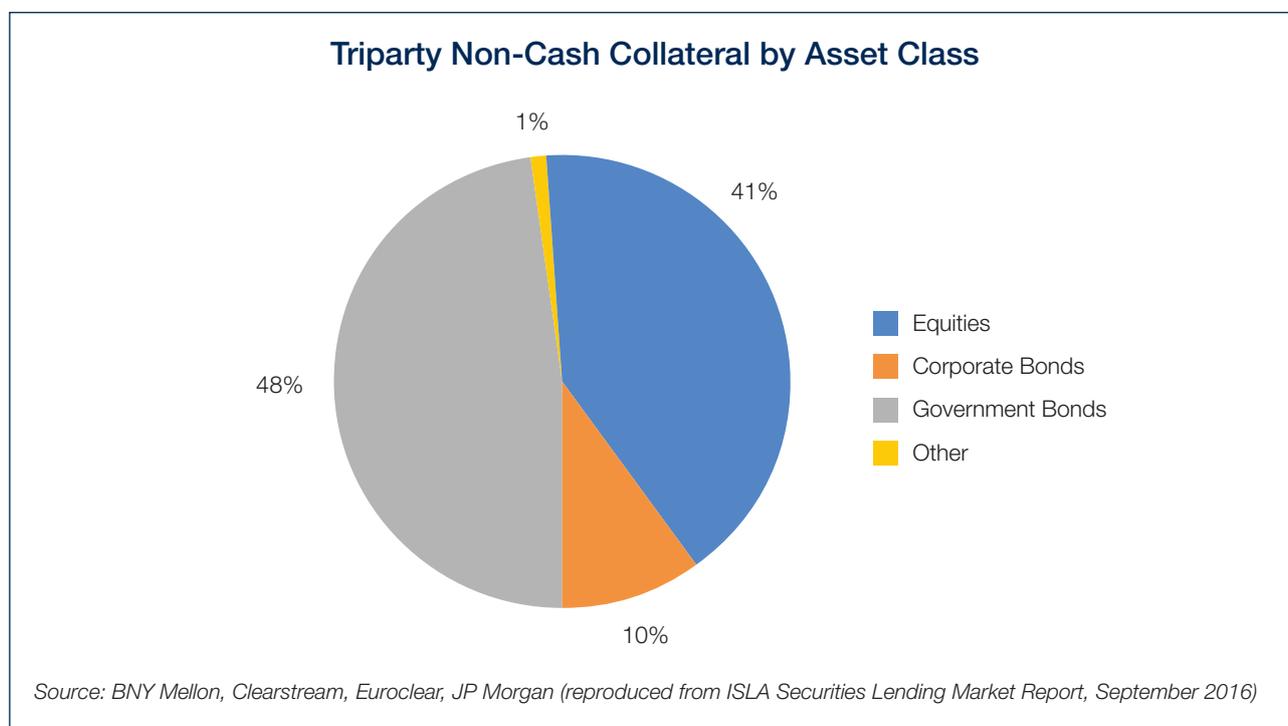
Given that most specifics are repo-ed or loaned on an open basis rather than for a fixed term, this allows the possibility for both lenders and borrowers to request a change in the repo rate should it tighten or cheapen (in the interest of the lender in the former case, and the interest of the borrower in the latter). For the most part it would seem that the credit repo market is not as sensitive as the sovereign repo market when it comes to renegotiating rates. This is explained largely by the fact that generally spreads are relatively wide enough to reduce sensitivity, as well as the underlying sizes of transactions being significantly smaller than in the government repo market. Thus, most counterparties tend only to request re-rates when prices move significantly, say in the case of a bond becoming very special. Some agent lenders explained that given that specific corporate bond lending is such a relatively small part of their overall lending activity, the time spent monitoring every single corporate bond loan, and adjusting rates wherever there is a little specialness, is economically inefficient when compared to being on top of their sovereign bond loan book and capturing every additional basis point on these balances. With respect to their corporate bond loans, apart from in the case where something goes very special, the objective is a steady return on stable balances, with minimum maintenance.

GC

The supply of corporate bond GC is primarily driven by the need to finance dealers' positions (or those of their leveraged clients). While non-banks usually finance their long positions on a bilateral basis with their dealer banks, banks tend to use triparty. This not only allows for flexibility in terms of pooling many different underlying positions, that can often be scrappy and turn-over on a high frequency basis, but triparty also plays an important role in the overall collateral and liquidity management of the bank (see Box 4).

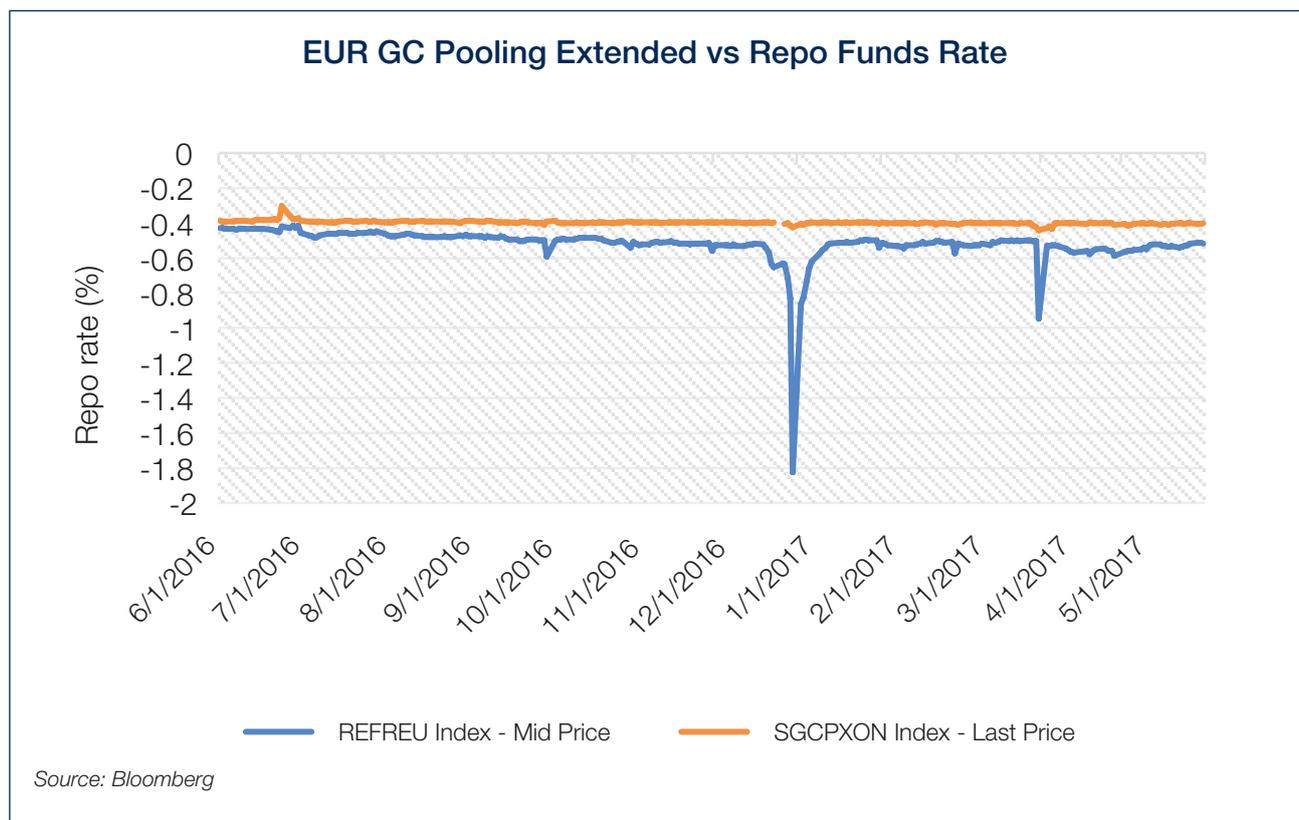
The demand for corporate bond GC primarily comes from short-term cash investors looking for greater returns than those provided by the sovereign GC market (usually banks, money-market funds, or even corporate treasuries), or agent lenders either looking to re-invest cash generated from their lending activities or as part of a collateral transformation trade.

Figure 11: underlying collateral types assigned to triparty



It is noted in many of the interviews that pricing in the GC market tends to be fairly aggressive, particularly in the current low-yield environment. For instance, there is very little spread differential between 'AA' rated corporate GC and HQLA sovereigns (some noted that often these can trade flat, particularly where the corporate bonds are ECB eligible collateral), while for collateral transformation trades, the spread between IG baskets and top tier HQLA (e.g. German or French government bonds) is only around 15bp. Figure 12, which compares the rates for overnight GC Pooling Extended Basket index (which includes high rated corporate bonds) with the overnight rate of euro sovereign GC, provides a proxy of the relative tightness of high quality corporate bond GC. However, spreads do tend to widen in the case of HY and equity GC, where returns of 40-50bp seem to be the norm.

Figure 12: high quality euro GC rates¹⁵ vs sovereign bond GC rates¹⁶



¹⁵ The STOXX GC Pooling EUR Extended ON Index rep is an effective interest rate in the secured interbank money market, computed as a vol-weighted average rate of all EUR OverNight transactions in the ECB Extended basket of the Eurex Repo GC Pooling market, concluded on the current business day.

¹⁶ RepoFunds Rate Euro (RFR Euro) is a daily euro repo index calculated from trades executed on the BrokerTec and MTS electronic platforms. All eligible repo trades are centrally cleared and RFR Euro is calculated and published by ICAP Information Services. RFR Euro is calculated with repo trades that use sovereign government bonds issued by any country in the Eurozone.

Box 4: Collateral transformation (or collateral swaps)

Collateral transformation is the somewhat grandiose, and highly misleading, name given to the simultaneous repo and reverse (or loan and borrow) of differently rated (or valued) securities or baskets of securities. Where an entity lends out collateral against borrowing higher quality collateral, this is referred to as a 'collateral upgrade'. The other side of this trade (i.e. a counterparty lending out quality collateral against borrowing lower quality collateral) is referred to as a 'collateral downgrade'. Usually, the counterparty 'upgrading' pays a fee or spread to the counterparty 'downgrading', which represents the relative difference in current market repo rates for the respective collateral classes.

Sometimes also referred to as a collateral swap, these transactions can be in the form of two back-to-back repo transactions, or as a single collateral-versus-collateral securities lending transaction. These more aptly named collateral swaps can be in the form of bilateral transactions (e.g. a specific corporate bond against a specific sovereign bond), however, it is more usual for the lower grade collateral to be in the form of triparty, which affords greater flexibility to the lender (primarily banks). However, what is important to note is that in these transactions no collateral is 'transformed'; simply two pools of collateral are simultaneously loaned and borrowed between two counterparties (i.e. collateral is swapped).

Collateral swaps are an important tool for collateral management, since they allow market participants that are required to post initial margin in the form of HQLA, but who may be sitting on non-HQLA assets, to swap their holdings, for a fee, for eligible collateral. It is also an important liquidity management tool for banks that need to ensure term liquidity profiles (funding their assets for an average of at least 30 days) while holding HQLA buffers to meet LCR requirements. The optimal trade from this perspective is a term (often anywhere from 3 months to longer than a year) upgrade trade, taking HQLA against lending non-HQLA triparty sets. Often these collateral swaps are in the form of an 'evergreen' or an 'extendable' trade (i.e. a collateral swap with an agreed term, say for 13 months, that automatically resets to the same term after each month, unless one of the parties elects to end the automatic resets and allow the trade to roll-down for the originally specified fixed-term).

Furthermore, given that these transactions consist of both a loan and borrow with the same counterparty, for the same term, and (usually) settled in the same CSD with the intention of settling 'net', they can be netted under Leverage Ratio rules, and so are highly balance sheet efficient.

Haircuts

Haircuts are a standard feature of the credit repo market. This is the equivalent of initial margin, whereby a repo or loan is under- or over-collateralised with respect to the market value of the underlying collateral, with the counterparty considered the lesser credit in a transaction 'paying' the haircut.

In general, it is normal for agent lenders or investment funds to charge a haircut to banks to whom they lend bonds, whilst banks generally charge haircuts to their leveraged clients, both with respect to lending and borrowing bonds. Non-bank lenders of cash (GC trades) may also charge banks a haircut. Haircuts charged by banks on other banks are rare, although not unknown.

While the various interviewees were reluctant to divulge specific details about the levels of haircuts they either charge or receive, not least since haircuts are often counterparty specific, it would appear that most agent lenders apply relatively standard haircuts with their bank counterparties, depending on the credit of the underlying bonds they are lending and the nature of the collateral they receive in return (e.g. cash, sovereign bonds, or IG corporate triparty), but generally these seem to be in a 2-5% range. Banks, meanwhile, tend to apply haircut matrices, with varying degrees of complexity, that not only take into consideration the underlying bond (including characteristics such as credit rating and maturity), as well as the term of the transaction, but also credit considerations with respect to counterparty risk. It is not unusual for haircuts to be in the 5-15% range, but in the case of the very lowest credits, or distressed debt, these can be significantly higher. It is also important to consider that haircuts applied by banks are largely designed to cover the capital requirements related to the underlying trade; so where haircuts are at the lower end of the scale, this is counterbalanced by a higher capital charge.

However, regardless of the methodology applied by different participants in setting haircuts, a commonality is that in general they are not dynamic, i.e. they do not increase or decrease in response to underlying market conditions or changing counterparty risk considerations. Rather, the response is less subtle and more binary, with credit lines being reduced (or even pulled) for certain transactions or counterparties, instead of haircuts being adjusted.

A more recent trend has been for some banks to try imposing haircuts on the interbank market. Largely unpopular, this seems to have had mixed results, with some banks refusing to take haircuts from their peers, while others, when faced with no alternative source of supply, particularly in order to make a high priority settlement, will reluctantly accept the haircut, albeit on an ad hoc basis. This also highlights a change in perception that banks were generally considered among the safest counterparties, and historically would only take haircuts from the lenders.

Settlement efficiency

Settlement efficiency (i.e. the ability to settle transactions on their intended settlement date) is a critical factor when considering the overall efficiency of the credit repo market, not least since the primary reason for borrowing and lending specifics is to ensure that market-makers, and other participants, are able to settle their trades. Both anecdotal and quantitative evidence suggests that on the whole settlement efficiency rates (i.e. the proportion of trades settling on their intended settlement date) are extremely high, with corporate bond fails as a percentage of overall transactions around 3%, and only slightly higher than the rate for sovereign bonds (see Figure 13). Despite a low interest environment, where specific repo rates tend to be negative (even for USD and GBP), and where the natural economic incentives to settle trades break-down, the reputational and relationship incentives to settle trades seem to work well. What many respondents suggest is that while fails are part and parcel of the credit markets, more often than not these are caused by settlement inefficiencies, rather than a deliberate intention of counterparties not to borrow against their short-sales. Many interviewees cite the lack of interoperability between (I)CSDs as being a key structural cause of settlement fails, while others point to internal inefficiencies, such as lack of investment in updating settlement systems, or the downsizing, downgrading, or outsourcing of settlement teams as banks look to reduce costs.

Short-selling restrictions

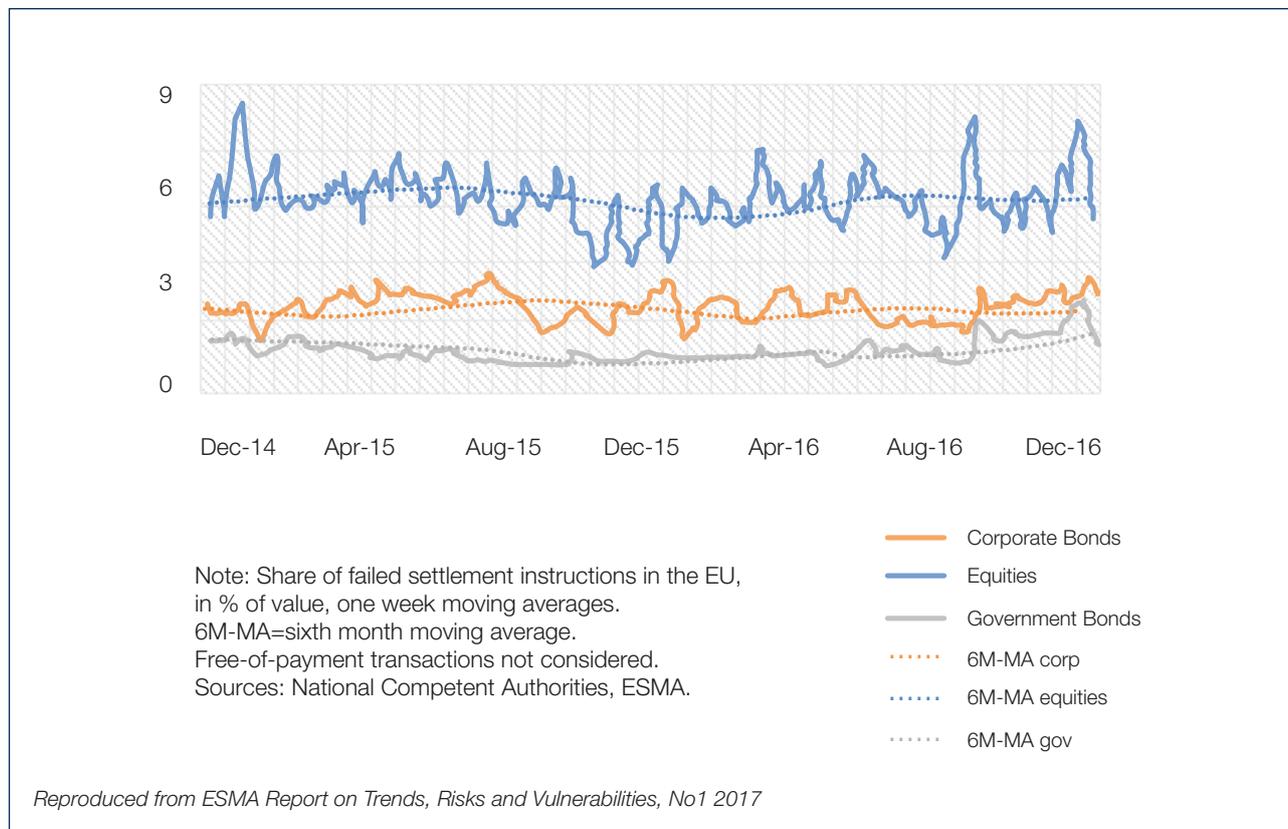
Both banks and hedge funds are keen to point out that their prime-brokers do not permit their clients to enter short positions in credit without first obtaining a 'good locate'¹⁷ from the PB itself (i.e. the PB is comfortable that it can cover the short on repo on the client's behalf), or securing repo from another source. In the event that PB clients do short without a 'good' or pre-borrow, and where borrow is subsequently unavailable, banks report that it is not unusual to force the client to buy their position back (or to pass-on the cost of any resulting buy-in).¹⁸

That said, it is widely acknowledged that the possibility of fails does increase as one moves down the credit curve, particularly into the HY space, and where a lack of repo supply also becomes a consideration in settlement efficiency. Although it is also pointed out that investors are generally understanding of the increased settlement risk and realise that a degree of tolerance to late settlement is a necessary trade-off in return for offer-side market liquidity.

¹⁷ A 'locate' is a securities lending term, adopted by credit repo traders, which is the equivalent to a request for quote (RFQ) for borrow. A 'good' is an indication from the credit repo trader that it is borrowable and therefore safe to short.

¹⁸ A number of interviewees were keen to stress the importance of short-selling in supporting market efficiency, but that strict policies with respect to covered-shorts were essential to ensure market stability.

Figure 13: EU settlement fails by asset class



Too small to settle

The interviews suggest that perhaps the main cause of incidents of prolonged fails in the credit repo market is the trend toward smaller trade sizes in the underlying market. Given the marginal economics of lending securities, including ticket, settlement, and administration costs, as well as the potential risks of not getting your securities back on time, it is difficult to rationalise lending very small sizes, even where spreads can be significantly widened. Thus, many lenders (and banks) have a policy of minimum size repo and lending trades for corporate bonds; usually USD 1mn, EUR 1mn, and GBP 500k (although a number of lenders reported that they will go to half these sizes again, but for a higher fee). The trend toward more rapid dealer turn-over causes a further challenge to the economics of lending bonds, where the average duration of borrow may only be for a few days, rather than a few weeks. Again, some lenders request minimum borrow terms of one-week, particularly where they are lending very small shapes.

Historically, credit repo desks would manage so called ‘odd-lot’ shorts by borrowing the minimum size available in the repo or lending market (e.g. they may cover a 100k short with a \$1mn borrow), calculating the cost of carrying the excess amount on their matched-book (so \$900k excess, in this example), and pass on this cost through the rate they charge their trading desk or client. Similarly, with minimum borrow terms, they would carry the over-borrow for the additional days, and again charge the cost of this back to the trading desk or client. However, given the scarcity and cost of balance sheet, as well as the relative increase in the number of odd-lot shorts that require financing, often repo desks are unable to justify running balances of excess borrow. In these case, many fall back on the auto-borrow facilities of the CSDs (see Box 5), or fail.

Repo ‘shorting’

Perhaps one unexpected market observation, which was highlighted by a number of banks, as well as IDBs, is that the negative interest rate environment has provided the potential opportunity of a ‘free option’ for credit repo desks trading in the street, who can counter-offer against bids at negative rates, or even hit negative bids, with a view to sourcing the bonds subsequently more cheaply, in full knowledge that their worst case scenario is that the repo will either get re-rated to 0% or canceled in the event that they are unable to source the bonds. While this is not a widespread practice, some desks apparently have, on occasion, adopted this strategy, much to the frustration of both their interbank counterparts and the IDBs. However, it was also explained that the market is very

good at policing itself, and that banks which develop a reputation for failing on an above average frequency soon find themselves being denied access to the market, either as a result of banks restricting who sees their axes and locates, or by the IDBs filtering their client interests to ensure that banks with more reliable settlement rates get 'first show'.

Mini close-outs¹⁹

Repo (GMRA) and securities lending (GMSLA) documentation provide the contractual frameworks for remedies in the event of fails in the repo and lending markets.²⁰ Generally, there is not a lot of protection for the borrowing counterparty where the lender fails to deliver bonds at the start of a trade, other than providing the right to claim for lost interest in a positive rate scenario, reset the repo rate to 0% in a negative interest rate scenario, or cancel the trade. In other words, the borrowing counterparty can avoid direct losses from the fail, but cannot force delivery nor avoid indirect losses that could result from contingent transactions, such as an outright sale that subsequently fails. This is intentional, since anything more punitive would be a disincentive to lenders who only achieve incremental income from lending securities, which would be dwarfed by, say, the cost of a buy-in.

In the event of a failing end-leg, however, say when the lender recalls an open repo and the borrower fails to return the bonds, the repo and lending agreements' *mini close-out* provisions allow the non-defaulting lender to cancel the end-leg of the trade, and claim from the defaulting borrower any costs incurred in replacing the underlying collateral from the defaulting borrower.

While canceling or re-rating to 0% failing start-legs is quite common in the case of credit repo fails, issuing a mini close-out against failing end-legs is relatively rare.

Buy-ins

Buy-ins²¹ are the standard contractual remedy and risk-management tool open to non-defaulting purchasers of bonds in the event that they are failed to, and which allows them to force delivery without changing the original terms or economics of the trade.²² While buy-in 'threats' and the issuance of buy-in notices are not unusual, it becomes clear from the interviews that actual buy-ins are relatively rare. The interviews suggest that often a buy-in notice (i.e. the start of the process but not the actual buy-in execution) is enough to flag to a counterparty that they are failing, or to focus their settlement teams on trying to resolve the issue. Often, multiple fails can be the result of a single fail by one counterparty that impacts the whole chain of transactions in the underlying bond. Where counterparties are part of the chain, but not the cause of the fail (i.e. they have both a failing purchase and a failing sale), they may not necessarily be incentivised to settle the trade by leaning on their failing seller; however, the pass-on mechanism of a buy-in (which makes buy-ins transferable along settlement chains), seems to be an effective and efficient way of reaching the root cause of the fail, even though the failing entity may be completely unknown to the originator of the buy-in notice.

Buy-ins vs close-outs

While in some respects the close-out mechanism for the end-leg of repos (and loans) is *similar* to a buy-in, a number of interviewees were keen to stress that contractually it is not the same as a buy-in for outright trades,²³ and that there is no contractual interoperability between the two remedies. This can create problems, and risks, where the settlement of the sale of a bond is contingent on the settlement of a repo. As already explained, where the settlement of a short-sale is contingent on the settlement of the start-leg of a repo, the seller runs the risk of a buy-in should the repo fail, but has no recourse to pass the cost of the buy-in on to the failing repo counterparty.

Meanwhile, in the event that the settlement of a long-sale is contingent on the settlement of an end-leg of a repo (such as the recall of a loaned position, should the failing repo trigger a buy-in against the resulting failing sale, the defaulting seller may be able simultaneously to execute a close-out against the failing repo counterparty, and also apply the buy-in price to the close-out settlement claim. But there is no guarantee that they are able to do this, and in the case that the buy-in price (over which the bought-in counterparty has no control) is considered inappropriate by the closed-out repo counterparty, they could challenge it, leaving the counterparty caught in the middle; exposed to an effective contractual basis risk and unable to pass-on the cost of the buy-in to their repo counterparty.

¹⁹ An overview of the mini close-out terms and procedures can be found in the [ICMA FAQ on repo and collateral markets](#)

²⁰ Both the GMRA and GMSLA are based on title transfer collateral arrangements (TTCA) which support risk mitigation in the event of settlement fails. Importantly, these remedies apply at the point of the 'break' in any transaction chain, rather than affecting the entire chain, and so minimize the risk of associated 'fire sales'.

²¹ In the European credit markets, the most commonly employed buy-in process is that provided under the [ICMA Secondary market Rules and Recommendations](#)

²² In March 2016, following a consultation of members, ICMA [updated](#) the buy-in process to make it more flexible, particularly in response to more challenged market liquidity conditions.

²³ There are also potential contractual 'basis risks' between the GMRA and GMSLA close-out provisions, as well as between different GMRA or GMSLA contracts.

While repo fails create additional risks for liquidity providers (given the lack of recourse in the case of a buy-in), the relative infrequency of buy-ins and the ability to respond to a manageable number of buy-in notices, as well as the general tolerance of investors and other market participants for late settlement in the credit markets, market-makers generally consider these risks to be low and containable.

However, a number of lenders pointed out that the risks of not getting back bonds out on loan in time ('re-call risk') to settle onward sales by clients was becoming a growing concern, particularly in the HY space, and so a disincentive for lending. As discussed further in the next section, it also highlights the potentially devastating impact the CSDR mandatory buy-in regime is expected to have on credit repo market liquidity.

Box 5: CSD autoborrow programs

While some CSDs, in particular the ICSDs, support securities lending and borrowing (SLB) programs for their members, some also provide an automated borrowing and lending facility ('autoborrow') in the event of settlement fails. (I)CSD participants have the option to make their positions available to lend into the autoborrow programs, while also having the option to borrow securities in the event that they are insufficient on a settlement. The (I)CSD charges a predetermined fee to the borrower, and compensates the lender. Thus, rather than being a dedicated lending program, the autoborrow functionality is more a 'last resort' fails mitigant.

Data suggest that the usage of these facilities for corporate bonds, as a proportion of securities loaned through the standard SLB programs, is relatively small. However, where sizes are too small, or the term of the borrow too short to justify locating and borrowing bonds, the autoborrow programs are often a useful backstop to ensure settlement.

Regulation

The impact of the myriad regulatory initiatives on repo markets, both macro-prudential and market based, is well documented,²⁴ and is slowly becoming better recognised and understood. However, one of the objectives of this study is to see how the post-crisis regulatory reforms were specifically impacting the credit repo market, as well as the perceived risks and challenges related to pipeline regulation.

Leverage ratio

While the Leverage Ratio (LR) is the single biggest constraint with respect to the sovereign bond repo market, limiting the ability of banks to provide market intermediation services, it appears to have a less direct impact on the credit repo market, particularly with respect to specifics. The spreads attainable in credit repo, in most cases, seem to cover the LR hurdles. Also, an increase in the propensity for banks to borrow bonds on a bond-versus-bond basis, rather than bond-versus-cash, helps from a balance sheet netting perspective. Although some banks still prefer to borrow on a bond-versus-cash repo basis, primarily where they are subject to IFRS accounting standards which provide no netting relief where the borrow is collateralised with corporate bonds, and where HQLA collateral is considered more valuable than cash.

The LR does seem to have more of an impact on outright GC financing transactions, particularly for high rated bonds, given larger trade sizes, tighter spreads, longer terms (so less flexibility around reporting dates), and the limited opportunity for balance sheet netting. As previously discussed, this is also a key factor in driving the business models of various credit repo desks, and the relative dominance of some banks, or jurisdictions, in GC financing as opposed to specifics.

RWA capital ratios

For credit repo, particularly specifics, it is the risk weighted asset (RWA) driven cost of capital that is generally the binding constraint on intermediation. Banks' internal models need to account for the credit quality and relative risk and volatility of the underlying assets, as well as counterparty risk, correlation risks, and the impact of haircuts. Where banks are in a position to set appropriate haircuts and a degree of price control, this is generally supportive of the business model (i.e. they are able to pass on these costs to their internal or external franchise). Where they lack bargaining power over these variables, this becomes a deterrent to intermediation, which in turn becomes a constraint on the underlying activity, internal or external, driving the repo activity.

²⁴ For example, see [Perspective from the eye of the storm: the current state and future evolution of the European repo market](#), ICMA, 2015

The interviews also highlight that the counterparty impact on RWAs is forcing credit repo desks to become more discerning with respect to the underlying clients they are transacting with via the agent lenders. While they are unaware of the underlying client allocations at the time of trading, in many cases they will have already made an agreement with the agent with respect to non-eligible (i.e. high RWA weighting) underlying clients, or, post trade, they will look for opportunities to switch their borrow from RWA-heavy lenders to lower RWA clients.

However, where the increased cost of capital is having the most impact on the market is in limiting credit repo desks' ability to warehouse repo positions in anticipation of dealer or client demand, or to make term markets in specific bonds (essentially true matched-book trading). Accordingly, specifics trade almost exclusively on an open basis, and are only borrowed as needed. This lack of term availability and matched-book liquidity increases the financing risks of running short positions, as well as making it more difficult to price single-name CDS.²⁵

LCR

As already discussed, the Liquidity Coverage Ratio (LCR) has a major impact on how long corporate bond positions are financed in the market, which is primarily through term triparty structures, and often in the form of both LCR and LR friendly collateral swaps (or repo versus reverse-repo). These transactions allow banks to fund constantly changing, short-term, often small underlying positions, while maintaining their short-term liquidity buffers.

NSFR

While virtually all the banks interviewed already comply with RWA, LCR, and LR requirements, even where not yet legally enforced, none have yet adopted the Net Stable Funding Ratio (NSFR), although some report that they are beginning to assess the cost to their business. US banks are expected to begin complying with NSFR from the start of 2018, while some non-US banks also expect to adopt it from next year.

The major issue with NSFR for repo markets lies with the asymmetry with respect to the required stable funding weighting for short term (i.e. less than six months) cash loans to banks and other financial institutions (i.e. where they borrow securities) and the available stable funding weighting for short term borrowing (i.e. where they lend securities). Under the Basel III outline, the former applies a 15% factor for non-Level 1 assets (so most corporate bonds), while the latter has a 0% factor. In other words, a bank borrowing a corporate bond on open, whether to finance the bank's trading book or for a client, will be required to assign long-term funding against that borrow, that is the equivalent of 15% of the underlying value of the securities being borrowed. That is a cost that must either be passed on to the market-maker whose position is being financed, or to the end borrower on whose behalf the bank is intermediating. Even under the latest European proposals for CRR/CRD IV, this asymmetric long-term funding requirement is still a hefty 10%.

At this stage interviewees are unable to quantify the overall impact on credit repo market pricing and liquidity, and less so with respect to underlying credit market pricing and liquidity, other than noting the fact that NSFR will significantly increase the cost of being short (as well as long) corporate bonds.

CSDR mandatory buy-ins

As discussed in the previous section, the risks of buy-ins, and the lack of protection sellers have with respect to failing repos, is something that market-makers need to consider as part of their pricing as well as their willingness to provide offer-side liquidity. The less depth and liquidity in the underlying repo market, the greater the risk of not being able to make good delivery on their sale, and so the greater the risk of being bought-in. This creates a negative feedback loop. The greater the risk of buy-ins, the less inclined holders are to lend their bonds. Which reduces repo market depth and liquidity. Which increases the risk of buy-ins.

While currently buy-ins are relatively rare, and buy-in threats, for the most part manageable, it is widely anticipated by the interviewees that the implementation of the CSDR mandatory buy-in regime (expected in late 2019) will significantly alter the risks and dynamics of both short selling and securities lending with devastating effects for European corporate bond market liquidity.²⁶ In fact, of all the topics raised during the various interviews, none prompted such a palpable degree of resignation or despair as mandatory buy-ins. 'Total insanity', was the response of one interviewee, a sentiment which seems to prevail in the responses of virtually everybody that was interviewed.

²⁵ An important factor in pricing the basis between CDS and 'deliverable' bonds is the term cost of financing the long or short cash bond position. Where there is no term repo market, this becomes more of a guessing game.

²⁶ See the [ICMA Position Paper on CSDR Settlement Discipline](#), April 2017, for more details on the regulation, as well as the [ICMA CSDR Mandatory Buy-in Impact Study](#), February 2015, which attempts to quantify the impact on bond market pricing and liquidity.

Many question the impetus for the regulation, particularly the attempt to replace an established and effective fails management tool with a mandated requirement to issue buy-ins whether it makes commercial sense to do so or not, and with no regard to market stability.

One credit repo trader did point out that the equity securities lending market still manages to function effectively with mandatory buy-ins, however, it was also noted that this is a very different proposition to an OTC bond market that is dependent on market-makers in order to function. Another trader felt that in some ways it could be good for credit repo desks since it would increase demand, as dealers would try to warehouse pre-borrow in the bonds for which they were market-makers, or as short-sellers 'double covered' (i.e. borrowed twice the amount of bonds needed, from different counterparties) to hedge fails risk, while also pushing repo spreads much wider. However, they also conceded that any initial benefits would soon be washed away as market-making and underlying market activity inevitably declined.

Agent lenders confirmed the fear that mandatory buy-ins would reduce the supply of corporate bonds to the repo and lending markets. It was suggested that the risk of losing a lender relationship due to the failed return and subsequent buy-in of an odd-lot corporate bond loan was not commensurate with the low revenues generated through lending corporate bonds to the market. One agent lender stated that given the relatively small size and revenues of the specific corporate bond portion of their lending books, it simply would not be worth the risk nor the hassle of continuing this activity once mandatory buy-ins come in. Meanwhile, a hedge fund explained that while lending specifics from their high yield portfolio currently helped to lower their overall financing costs, with the introduction of mandatory buy-ins they would no longer be able to run the risk of lending bonds to the market, and would instead rely on their PB to fund their longs via triparty.²⁷

SFTR & MiFIR

While by no means the top of anybody's list of regulatory concerns, a few interviewees did point to the disproportionate burden of transaction reporting, particularly under the soon to be implemented SFT-Regulation. It was noted that while nobody has any complaint with regulatory transaction reporting, the level of detail and individual data points made compliance a significant technological investment, which could prove to be a barrier to entry for some market participants. As one credit trader repo commented, having to report every single end-of-day collateral substitution in a triparty trade is a painful as it is pointless.

Some interviewees also flagged MiFID II/R best execution reporting requirements (RTS 27), which provides for highly granular historical quote and trade related data, for all securities, and for each trading day, to be made publicly available on dealer banks' websites on a quarterly basis. They noted that while it made no sense to apply this reporting obligation to repos, there was no clarity from the authorities (at least at the time of the interviews) and so firms' compliance teams were beginning to take a worst-case view, investing in the technology builds necessary in order to be able to comply with reporting for repo transactions from the start of 2018. Other than the redundancy of the data that will eventually be published for repo, the interviewees also stressed the additional challenge of capturing and processing the vast amount of data required, given the OTC and largely unautomated nature of the credit repo market.

Monetary policy

There are two main ways in which central bank monetary policy impacts the credit repo market: through the very low (or negative) interest rate environment, and through the effects of quantitative easing in the form of central bank corporate bond purchases.

Low interest rates

In theory, very low, and in particular negative, interest rates could compress repo spreads for specifics, as well as increasing the instance of fails. However, neither of these potential impacts seem to have affected the credit repo market. If anything, anecdotal reports suggest that with respect to specifics, spreads have widened, particularly for specials, while settlement efficiency rates are consistent with historical norms.

²⁷ It is important to note that while the draft technical standards for the CSDR mandatory buy-in regime include an exemption for short-dated securities financing transactions, which is important from the perspective of secured borrowing and lending, as well as collateral and liquidity management, does this not help from the perspective of specifics, and misses the critical link between repo and underlying cash markets.

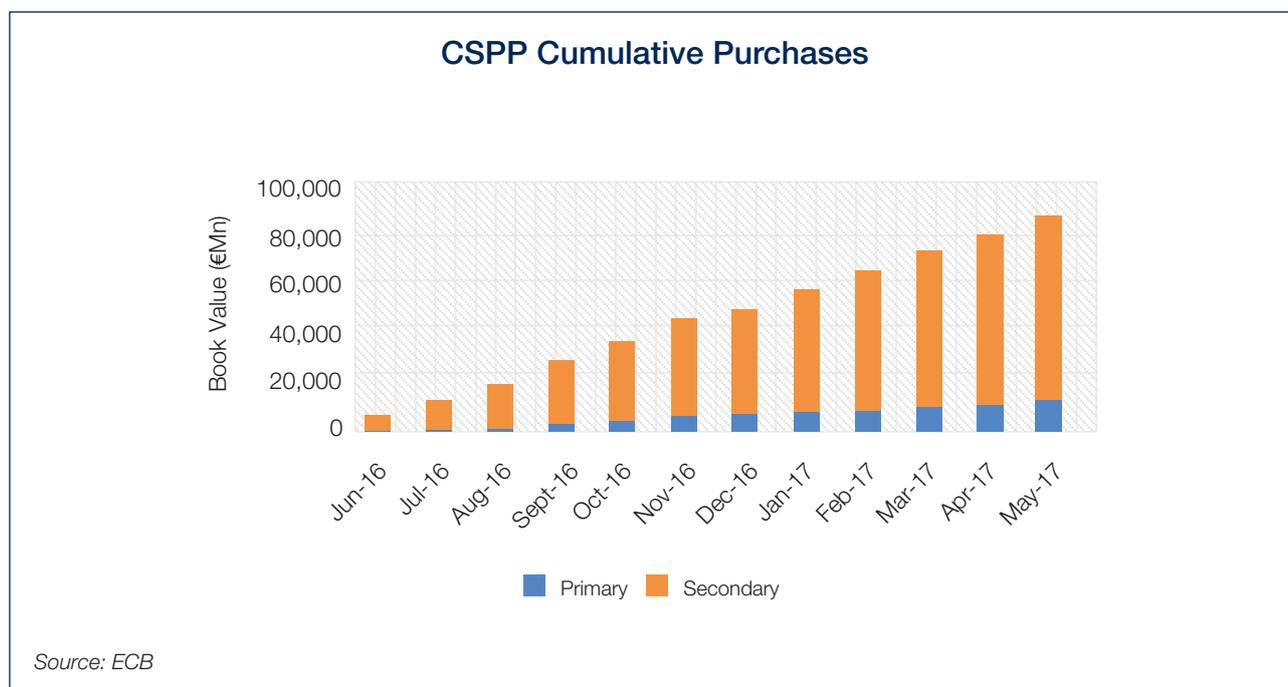
CSPP

At the time of the interviews, the ECB's Corporate Sector Purchase Programme (CSPP) had been running for 10 to 11 months and one of the key questions to participants was to what degree the CSPP was impacting the repo markets. Most credit repo traders felt that for the first six to nine months of the CSPP there had been very little impact in terms of repo availability or pricing. Some report that at the very start of the programme, in June 2016, there had been some tightening in repo rates for eligible bonds, as nobody was sure how the purchases would impact the market, and so there was both a demand to pre-borrow eligible bonds from dealers, and a reluctance to lend by holders. However, once the purchases began, and the market began to feel comfortable, any stresses in the repo market seemed to ease up, and despite occasional gapping in rates for eligible names, these tended to be sporadic and short-lived.

A number of interviewees did feel, however, that particularly since the start of 2017, it was becoming more noticeable in the repo market when the ECB had been purchasing certain issues, and where the market may have been left short. It was also explained that ECB purchases tend to have a disproportionate impact on the repo market, since the repercussions for failing to the respective central banks are so punitive that dealers try to double-cover on repo against their sales, even where they are selling long positions.

In theory, at least, the central bank purchases are available to be loaned back into the market through the respective NCB lending programs (similar to the sovereign bond purchases under the PSPP). However, the feedback from credit repo traders was that borrowing corporate bonds from the NCBs, as with sovereign bonds, was too much hassle, and only likely to be used as a last option; it was easier to pay up with the lenders or in the street. One interviewee suggested that at the start of the CSPP, the central banks were not particularly keen to lend back their corporate bond holdings, given the relatively small ticket sizes of the credit repo market; however, this seemed to have changed in recent months, perhaps prompted by the events in the sovereign repo market over the 2016 year-end.

Figure 14: cumulative CSPP purchases



Stresses in the sovereign bond repo market

A number of interviewees also highlighted the spill-over effects of recent stresses in the euro sovereign repo market, and which were particularly accentuated over the 2016 year-end.²⁸ While the rate volatility and dislocations that have become the relative norm over quarter-ends do not in themselves have a significant impact on the availability of corporate bond specifics, they do create indirect challenges. For instance, lenders who lend bonds against cash (i.e. through repo) need to reinvest their cash in the sovereign GC market. As it was explained, this runs the risk of lenders investing at significantly lower rates over these periods than the rate they are earning on their corporate bond loans. Where lenders lend their corporate bonds against sovereign collateral this neutralises that particular risk, however, it instead becomes the risk of the borrowing bank, who may find themselves paying up for sovereign collateral over statement dates. Finally, it also needs to be remembered that credit traders usually hedge their interest rate risk with sovereign bonds (see Box 1), so can be as impacted by unexpected liquidity squeezes in the sovereign repo market as by dislocations in the credit repo market.

Automation, transparency, and data

What becomes clear through the interviews with various market participants, as well as in trying to source market data, is that the European credit repo market is very much a highly manual, labour-intensive market. Credit repo desks, as well as their clients and IDBs, largely rely on Bloomberg's messaging functionality to 'cut and paste' interests and axes lists, which they share with their various counterparties. Daily axes, interests, and locates sent to credit repo desks or IDBs can easily run into the hundreds, while locates sent to agent lenders can be in the thousands. Then there are all the returns, recalls, and rerates that need to be managed, as well as monitoring for fails and following-up where trades do not settle. Throw in a couple of buy-in notices and a corporate action, and credit repo traders, brokers, and lenders begin to look like the busiest people in the financial markets.

On the face of it, this is a market screaming out for automation, yet it is not that straightforward, particularly given the range of underlying bonds being borrowed and loaned, the different means of transacting, the range of counterparties, different haircut matrices, bespoke schedules for collateralising borrows, as well as the importance of counterparty relationships and the need to call an occasional favour (particularly when things go wrong, such as a buy-in).

However, the market is not totally devoid of automation. Some agent lenders and investment funds, for instance, have automated the locate process, whereby any requests that they receive via Bloomberg messages are automatically matched with their holdings and lending availability. Yet this level of proprietary sophistication seems relatively rare, and many operations are still very much reliant on a combination of internal reports, Excel spreadsheets, and a Bloomberg terminal.

BondLend

Perhaps the single biggest innovation in the corporate bond lending space has been the introduction of BondLend, which is the fixed income platform of the long established EquiLend, which first gained prominence in the US equity and corporate bond lending markets in the early 2000s. BondLend allows agent lenders to make their (selected) lendable inventory available through the platform to banks who download locates into the platform. Availability and locates are matched, and borrows/loans automatically processed between lender and borrower. Both lenders and repo traders hail the arrival and growth of BondLend. According to one desk, the platform fills around 80% of their daily locates.

Furthermore, BondLend/EquiLend is currently in the process of evolving into a more sophisticated platform, NGT (Next Generation Technology).²⁹ While BondLend supports the automated locates and lending of non-special specific bonds between dealers and lenders (at pre-set rates or fees), NGT will provide functionality for borrowers and lenders to negotiate specials. It will also allow dealers to make available their own long inventory, so facilitating an interbank market. Furthermore, NGT is designed to accommodate more manually orientated desk, facilitating relatively easy access and uploading of trades into users' proprietary systems.

²⁸ See [Closed for business: a post-mortem of the European repo market break-down over the 2016 year-end](#), ICMA, 2017

²⁹ See [EquiLend's NGT](#), Securities Finance Monitor Magazine, Issue 3, January 2016

IDBs

While IDBs are an integral part of the European credit repo ecosystem, unlike the sovereign repo market, where the majority of interbank activity is traded through platforms (essentially automated IDBs), the credit repo market remains largely off-screen, with trades being negotiated and confirmed mainly by Bloomberg message or, where the trade may require more sensitive handling, by phone. Again, the heterogenous and highly bespoke nature of the credit repo market, as well as the lack of central-clearing, make it almost impossible to apply the central limit order book, 'click-to-trade', straight-through-processing model which supports the bulk of the more standardised short-dated GC and specials sovereign bond repo markets.

However, where there may be more scope for technological innovation is not so much in the inter-dealer space, but more in the dealer-to-client RFQ space. At least one MTF is looking to expand their existing dealer-to-client repo platform to include credit repo. The functionality is intended not only for dealers and clients to manage and negotiate RFQs, but also to provide bilateral straight-through-processing for settlement. Electronic platforms that support credit repo trading and lending may also take on more appeal as regulatory reporting requirements begin to land.

However, the key to the success of any innovation in the credit repo and lending space is likely to depend very much on how many lenders and dealers choose to plug into it, particularly at a time when technology budgets are being swallowed by regulatory compliance projects, sending market efficiency initiatives to the back of the line.

Transparency and data

Given the lack of automated, screen-based trading, the European credit repo market at first look appears relatively opaque. However, the interviews with various market participants suggest that, for the most part, it is relatively transparent and price efficient.

As previously discussed, the main source of price information and transparency in the interbank market is the IDBs, and while there is no screen based visibility as such, these brokers are only a phone call or Bloomberg message away. IDBs not only process the locates of multiple banks, as well as rerates, they also have the delegated responsibility for chasing up fails and corporate actions, and so they tend to have a good sense of where the market is and what is trading 'special'.

DataLend, part of the EquiLend/BondLend group, is a subscription service that provides detailed data on both equities and fixed income securities demand and supply, which is not only helpful for traders, but also for lenders. And while most IDBs, for now at least, are prevented by their dealer clientele from servicing non-banks, some are still able to sell market intelligence (such as generic GC and specific trading levels) to non-dealer entities, such as asset managers and hedge funds.

A number of interviewees also explained that while data and transparency are helpful for the market in providing reference points for price discovery, the value is relatively limited compared with outright or centrally cleared, exchange based markets. For instance, it may be helpful for a hedge fund to know whether a bond is on special or not, but the last print in the interbank market is no guidance for where they can lend or borrow, since the repo rate will also need to factor in a whole range of considerations, such as availability of repo lines, haircuts, and the balance sheet footprint of the trade for the intermediating bank.

Conclusion: the future of the market

The credit repo market principally (though not exclusively³⁰) exists to finance market-makers, enabling them to take long and short positions onto their trading books, and so is a fundamental cornerstone of corporate bond market liquidity. The ability of the credit repo market to function smoothly and efficiently directly impacts the pricing and liquidity of the underlying bond markets, which in turn has implications for both investors and capital raisers. The two most important elements with respect to the overall functioning and effectiveness of the credit repo market are supply and intermediation. While the market currently appears to work well, it faces two important challenges with respect to these critical factors.

Supply

The capacity for the credit repo market to function effectively is highly dependent on the supply of corporate bonds into the market. To a limited extent, supply will derive from dealers' trading books, however, the significant majority of supply comes from investors who are the primary holders of corporate bonds. The extent to which holders are able and willing to lend their holdings back into the market, whether directly or through agent lenders, has a direct bearing on the ability and willingness of banks to support the market-making function that underpins bond market liquidity.

What the study reveals is that, for the most part, supply into the European credit repo market is relatively good, particularly with respect to investment grade corporates. And while prices for specials, particularly in the high yield space, can be expensive and volatile, there is still usually availability. However, the changing nature of the underlying market, with a trend toward smaller trade sizes and more rapid turn-over of dealer positions, is making sourcing supply more difficult. While there may be plenty of bonds in the lending programs, there is little or no economic incentive to lend small sizes for short terms.

Looking forward, the single biggest challenge to supply is the CSDR mandatory buy-in regime. The overarching market view is that this will have dramatic and potentially devastating consequences for credit repo market liquidity. Quite simply, it is the ultimate deterrent to lending corporate bonds.

Intermediation

While a significant amount of dealer shorts is covered directly with agent lenders, credit repo desks and bank funding desks play a critical role in pumping both corporate bond specifics and general collateral through the system, financing not only their own trading books, but also other dealers and clients, as well as facilitating collateral management services both for their own banks and their clients. While credit repo and banking funding desks seek to transact in ways that optimise balance sheet, credit repo is still relatively capital intensive, and while the market seems to be highly efficient at pricing-in the cost of capital, these costs ultimately work their way into the bid-ask spreads of market-makers, and so back to bond market investors.

While any increase in the cost of capital to support credit repo intermediation has an impact on corporate bond market pricing, the biggest challenge to credit repo intermediation is likely to come from the application of NSFR, which will increase the cost of borrowing corporate bonds significantly. Again, the additional costs of NSFR on credit repo intermediation will need to be passed on to dealers and clients through the repo rates, and so ultimately into the pricing of the underlying market. However, there is also a risk that the cost of NSFR, with the additional long-term funding that may need to be raised to support repo market intermediation, may result in the reduction in or withdrawal of credit repo desks' services, beyond financing their own trading desks.

Automation

While ongoing and future challenges to supply and intermediation will ultimately determine the credit repo market's ability to play its pivotal role in supporting corporate bond market liquidity, there would certainly seem to be scope for creating efficiencies through automating many of the highly manual and labour-intensive process of the market: whether in terms of sending and processing locates, trade execution, negotiating and executing re-rates, re-calls, and returns, handling corporate actions, monitoring fails, and the straight-through-processing of confirming and settling trades, as well as subsequent lifecycle events. To the extent that any solutions can also support regulatory reporting requirements, or generate useful or saleable data, the greater its potential value to stakeholders.

However, automating the credit repo market is not straightforward, given the intricacies and nuances of the market, with the market becoming even more complex and fragmented with every layer of regulation. Yet there seems to be a need and an opportunity, not least given the rapid expansion of platforms and e-solutions in the corporate bond markets. However, the market seems to function relatively well for now. And ultimately, so the interviews suggest, just as with the underlying bond market, technology can help to support market efficiencies, but it cannot in itself create liquidity.

³⁰ For example, the market also supports secured lending, collateral management, and, theoretically at least, is an important element in CDS pricing.

Glossary of acronyms used in the report

AM	Asset Manager
bp	basis point (one-hundredth of a percentage point)
CCP	Central Counterparty Clearing House
CDS	Credit Default Swap
CRD IV	Capital Requirements Directive (IV)
CRR	Capital Requirements Regulation
CSD	Central Securities Depository
CSDR	CSD-Regulation
CSPP	Corporate Sector Purchase Programme
ECB	European Central Bank
ERCC	European Repo and Collateral Council
ETF	Exchange Traded Fund
GC	General Collateral
GMRA	Global Master Repurchase Agreement
GMSLA	Global Master Securities Lending Agreement
HF	Hedge Fund
HQLA	High Quality Liquid Asset
HY	High Yield
ICMA	International Capital Market Association
ICSD	International Central Securities Depository
IDB	Inter-Dealer Broker
IG	Investment Grade
IF	Investment Fund
IFRS	International Financial Reporting Standards
IRS	Interest Rate Swap
ISIN	International Securities Identification Number
LCR	Liquidity Coverage Ratio
LR	Leverage Ratio
MIFID II	Markets in Financial Instruments Directive (II)
MIFIR	Markets in Financial Instruments Regulation
MMF	Money Market Fund
MTF	Multilateral Trading Facility
NCB	National Central Bank
NSFR	Net Stable Funding Ratio
OTC	Over The Counter
PB	Prime Broker/Brokerage
PSPP	Public Sector Purchasing Programme
QE	Quantitative Easing
RFQ	Request For Quote
RWA	Risk Weighted Asset
SFT	Securities Financing Transaction
SFTR	SFT-Regulation
SLB	Securities Lending and Borrowing
SN-CDS	Single Name Credit Default Swap

The ICMA European Repo and Collateral Council

The ICMA European Repo Council (ERC) was established in December 1999, to represent the cross-border repo market in Europe. It has become the industry representative body that develops consensus solutions to issues arising in a rapidly evolving marketplace, consolidating and codifying best market practice. The Council's on-going efforts to establish a robust infrastructure to underpin the European repo market include the development of the Global Master Repurchase Agreement (GMRA) and the publication of the ICMA ERC Guide to Best Practice in the European Repo Market – a document which is periodically amended as warranted by evolution in the agreed understanding of best practice. The Council also plays a significant role in nurturing the development of the repo market and supporting its wider use in Europe by providing educational courses and market information, such as the bi-annual survey of the European repo market which has become established over the past decade as the only authoritative indicator of market size and structure and the dominant trends.

On 4 December 2015, ICMA's board decided to change the name of the European Repo Council (ERC) to the European Repo and Collateral Council (ERCC). This change was made in order to recognise the increasingly intimate relationship between repo and collateral and the substantial focus of the ERC on collateral.

The ICMA Secondary Market Practices Committee

The ICMA Secondary Market Practices Committee is an open forum for sell-side and buy-side member firms active in the European investment grade corporate bond secondary market. Through open dialogue and engagement, as well as through its subsidiary working groups and work-streams, it seeks to be the representative body of the European corporate bond secondary market: addressing practical issues directly relevant to market practitioners; standardizing market best practice; disseminating relevant market information; and promoting the best interests of an efficient and liquid market.



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