



EUROPEAN REPO COUNCIL

**A white paper on the operation
of the European repo market,
the role of short-selling,
the problem of settlement failures
and the need for reform
of the market infrastructure**

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Foreword by Martin Scheck, Chief Executive of the International Capital Market Association (ICMA)

This wide-ranging paper on the operation and infrastructure of the European repo market is a timely and important contribution to our understanding of the workings of this market at a point when a range of regulatory and supervisory initiatives are being formulated in Europe in response to the financial crisis. Repo is a key tool in the collateral management process and essential for maintaining liquidity in both debt and derivatives markets: regulation, however well intended, which affects the efficient functioning of the repo market, could have widespread and undesirable consequences for the financial system.

While the financial crisis of the past three years has underlined the attractiveness of secured debt for bank funding, turbulent market conditions, particularly in sovereign debt markets, have highlighted existing barriers to effective clearing and settlement of repo transactions. This paper sets out the fundamental nature of these problems and proposes solutions and recommendations for creating a robust European infrastructure. It pays particular attention to fails in repo settlement, covering normal resolution mechanisms and the extra problems associated with low or negative interest rate environments.

ICMA has commissioned this white paper through the ICMA European Repo Council and its Committee (“ERC”). As one of the most active industry groupings operating within ICMA’s structure, the ERC is a role model of how market participants can work together to promote industry-led solutions to operational and legal issues arising in their daily business, while engaging in constructive dialogue with regulators.

1 Executive summary

- 1.1 The repo market performs a multitude of essential functions in the financial system, underpinning the efficiency and liquidity of other markets, as well as overall financial stability. Regulatory initiatives therefore need to be carefully considered in order to avoid unintended damage. This is all the more important given the increasing regulatory focus on collateral management as a means of containing risk, and the growing demands on financial markets, particularly the heavy debt issuance expected from governments and corporates. These are both areas where the repo market plays a critical role. (Section 2)
- 1.2 Repo is unique in sometimes offering negative rates of return. These are not the manifestation of a dysfunctional market, but a reflection of the strength of demand for particular securities in the context of unusually low general interest rate levels. Repo rates can become negative because they incorporate the fees required to borrow scarce securities. High fees and occasionally negative repo rates help clear the market by attracting supply and dampening demand. In some countries, the market is assisted in absorbing severe imbalances by debt management agencies providing additional supplies of scarce issues, either through temporary lending or permanent issuance. (Section 3)
- 1.3 Strong demand for a particular security in the repo market is often created by the need to cover short positions in the cash market. A short position is created by the sale of a security by a party who does not own that security and borrows rather than immediately buys the security in order to make delivery. Short-selling is a fundamental trading technique which performs an essential function in the financial markets, among other things, supporting market-making in government securities. It is also key to price discovery and the prevention of asset bubbles. (Section 4.1-4.7)
- 1.4 The suggestion is periodically made that short-selling is intrinsically destabilising in that it allegedly (more than any other trading activity) exacerbates financial crises by amplifying price falls, fuelling volatility and causing settlement failures, thereby contributing to disorderly markets and threatening financial stability. However, the evidence tends to point the other way. Studies in the equity market have shown that bans on short-selling have been followed by steeper price falls, increased volatility and wider bid-offer spreads. Markets can also be disrupted by the buying and selling of long positions. Indeed, given the relative sizes of long and short positions, the liquidation of long positions is likely to be a far more serious driver of falling prices. (Section 4.8)
- 1.5 Short-selling is overwhelmingly a legitimate and desirable market activity. Regulatory restrictions such as limits on short positions mistakenly presuppose that short-selling is inherently undesirable. They would impose unnecessary costs on all market users, including issuers and investors, and the burden of these permanent restrictions would be disproportionate to the infrequent nature of market disruption. It would also be difficult to set limits that do not damage market liquidity and such limits may not anyway be effective in achieving their objective of protecting particular securities from price falls. Given how little is

known about short-selling, the most prudent approach would be to monitor short positions through confidential reporting to regulators. (Section 4.9-4.13)

- 1.6 Attention has recently been focused on uncovered or “naked” short-selling, where a short sale of a security is made before being covered by borrowing. The traditional concern is that uncovered short-selling permits market manipulation by unlimited selling of a security. However, abusive uncovered short-selling is where the seller has no intention of borrowing and delivering the securities he has sold short, whereas the bulk of uncovered positions are temporary and taken for technical reasons, or unintentional and arise because of operational errors or market illiquidity. (Section 5.1-5.2)
- 1.7 Trying to prohibit abusive/intentional uncovered short-selling by requiring that borrowing should always precede short-selling mistakenly assumes that the relative timing of short-selling and short-covering is a reliable indicator of intent. A “pre-borrowing” regulation is not needed to address temporary uncovered short positions, as they are not a problem, nor is it a sensible way of addressing unintentional uncovered short positions, as it does not address the causes. It would also impair market efficiency and liquidity. As intentional uncovered short-selling is a form of market abuse, it should be treated like any other instance of market abuse and dealt with by applying existing market abuse regulations. As a matter of principle, regulation should target those abusing the market rather than the market itself. (Section 5.3-5.7)
- 1.8 While intentional uncovered short-selling, by definition, results in delivery failure, delivery failures in Europe are rarely the product of intentional uncovered short-selling. The problem is largely a reflection of occasional market illiquidity, the lack of borrowing back-up facilities in the form of automatic agency securities lending at national central securities depositories (CSDs), and barriers to “interconnectivity” between national CSDs and the International CSDs (ICSDs) that obstruct the efficient transfer of securities cross-border. Recent market turmoil has highlighted barriers that have hitherto been disguised by restrictive business practices at some CSDs. (Section 6.1-6.2)
- 1.9 The market itself has been very successful at addressing delivery failure. The scale of the problem is being continuously reduced by the adoption of electronic trading, central clearing counterparties (CCPs) and tri-party repo. It is also mitigated by access to liquid securities lending markets, where these are available, and the automatic agency securities lending facilities offered by the ICSDs. Most importantly, however, there are generally-accepted conventions in operation in the market which create economic incentives that, in normal circumstances, are very effective in deterring intentional uncovered short-selling and encouraging the covering of unintentional short positions. (Section 6.3-6.20)
- 1.10 While the normal economic incentives against uncovered short positions are weakened when interest rates fall to very low levels, the market has a range of sanctions in place that could be employed to deal with delivery failures in such exceptional circumstances (“buy-ins” and “mini close-outs”, and default rights in legal agreements). New initiatives have also been discussed, including

penalties for delivery failure, and there are many other improvements being implemented or proposed, including: the breaking-up of settlement instructions into smaller amounts (“shaping”) in order to reduce the impact of delivery failures; the use of post-trade pre-settlement matching services to weed out operational errors; and improvements in the systems and business practices at some CSDs to enhance their interconnectivity to the ICSDs in order to facilitate the identification and correction of errors in advance of settlement deadlines, and allow more efficient transfer of securities cross-border. (Section 6.21-6.30)

- 1.11 The fragmentation of European settlement undermines the efficiency of cross-border transfers of securities. It imposes unnecessary costs and risks on European markets, obstructs market clearing and saps market liquidity to the detriment of issuers and investors. Despite considerable progress in removing the barriers to cross-border settlement in Europe, special challenges continue to be posed by the lack of interconnectivity between some CSDs and the ICSDs. (Section 7.1-7.3)
- 1.12 Joint industry working groups involving the ICMA’s European Repo Council (ERC) have recently mapped best practice in terms of the functionality needed to ensure efficient links between CSDs and the ICSDs. The key features which were identified include: early feedback of information on the status of settlement instructions between depositories after close of business on the day before settlement, in order to allow users to fix unsettled instructions as soon as possible; the avoidance of inefficient matching processes outside the settlement system, such as telephone pre-matching by custodians; real-time or very frequent two-way feedback between depositories on the settlement day, to facilitate the fixing of unsettled instructions and the re-use of inward deliveries of securities; some form of matching during the day to identify and net off opposite instructions, in order to reduce liquidity needs; the frequent recycling of unsettled instructions back into the settlement cycle, in order to allow the two legs of failed repos to be netted off against each other; in CSDs running RTGS and multi-batch processes in parallel, the automatic recycling of instructions between the two processes; same-day access by users to input new instructions to fix errors; a long settlement cycle to spread activity across the business day; equal access to the CSD for all users over the whole day; end-of-day optional settlement to allow early detection of problems; delivery-versus-payment and free-of-payment settlement; automatic self-collateralisation mechanisms to maximise access to liquidity; and immediate finality of settlement to remove legal risks and allow the rapid re-use of securities. Interconnectivity problems with the CSDs in Greece, Italy and Spain have been highlighted by international market users and were severely aggravated during the recent financial turbulence. (Sections 7.4-7.5, 8.1)
- 1.13 In Greece, the main concern is the seizure of the cash and repo markets in government securities due to a collateral famine caused by the lack of credit limits for Greek counterparties. Technical issues include: the delays that have been caused by the practice of telephone pre-matching by local custodian banks, which still appears to be an issue for non-electronic transactions; objections to the possible re-introduction of the forced auction, because of the uncertain cost and unwillingness to be matched with a Greek counterparty; the lack of

overnight batch-processing; the shortness of the effective settlement window; and the lack of settlement shaping. Solutions to the scarcity of securities caused by credit issues include a special official repo facility for primary dealers to borrow phantom/synthetic bonds; a bond exchange facility; a CCP facility operated by a Greek sovereign entity to clear repos or collateral swaps; and the recycling of Greek government securities held by the ECB. Discussions between the CSD and market users are continuing. (Section 8.2-8.7)

1.14 In Italy, there has been a dramatic increase in delivery failures since late 2009, but apparently only for transactions cleared through the international CCP, LCH.Clearnet, and not those cleared through the domestic CCP, CC&G. There is no consensus on the cause. Some argue that the problem stems from the trading activities of international investors during recent market difficulties. Others believe that market turbulence merely aggravated existing interconnectivity problems. Both arguments may have some validity. It may well be that differences in the trading behaviour of domestic and international investors were accentuated by market turbulence but caused higher settlement failures only because of the barriers to interconnectivity. Interconnectivity issues include: unsettled instructions not being recycled from the RTGS back into batch-processing; the lack of matching in the RTGS; the difficulty of fixing instructions in the RTGS; delays caused by the requirement for telephone pre-matching by local custodian banks; lack of timely settlement information for users; late settlement finality; an early end to the settlement day for users other than local custodian banks; and lack of a liquid securities lending market. The restricted functionality of the RTGS appears to have led to its underuse and the inefficient practice of telephone pre-matching by custodians. There is also concern that the CSD performs the netting calculations for the CCPs, blurring the division of risks in the clearing and settlement process. Discussions between the CSD and users are continuing. There has been modest progress, principally some harmonisation of settlement shaping. (Section 8.8-8.14)

1.15 In Spain, interconnectivity concerns include: the shortness of the settlement day, in part due to late access being restricted to own-account members of the CSD; late finality of settlement; and lack of direct access to the CSD for many types of cross-border market user. High settlement rates may be the product of restrictive practices. There is also concern over the role of the local CCP, which does not appear to genuinely reduce credit risk, and the obstacles to other CCPs. Progress has been made recently on some issues. (Section 8.15-8.16)

2 The importance and role of the repo market

2.1 The repo market is at the core of the financial system. It is pivotal to the functioning of markets and a cornerstone of stability.¹ The fundamental importance of the repo market is reflected in the range and nature of its market and systemic functions:

2.1.1 **Providing an efficient source of money market funding.** By offering secured money market assets to cash investors, by disintermediating

¹ For a definition and description of repo, see Annex I.

traditional but less competitive financial channels, and by diversifying credit exposure beyond the banking sector, the repo market mobilises cheaper and deeper funding for financial intermediaries, which in turn lowers the cost of financial services to investors and issuers. In contrast to the unsecured deposit market, the European repo market provides liquid term funding.

- 2.1.2 **Providing a secure home for liquid investment.** The capacity of repos, collateralised by high-quality securities, to mitigate credit and liquidity risks is particularly valued by risk-averse end-investors, not least the money market mutual funds that aggregate retail savings.
- 2.1.3 **Broadening and stabilising the interbank money market.** The collateralised nature of repo permits wider participation in the professional money market (ie not just commercial banks). Diversification creates a deeper and more robust market, which facilitates liquidity management between financial intermediaries and reduces systemic risk. The repo market also mitigates risk in the interbank market by allowing anonymous trading across CCP-intermediated electronic trading systems (among other things, anonymity avoids the automatic withdrawal of credit lines when an institution's creditworthiness is questioned).
- 2.1.4 **Facilitating central bank operations.** The repo market provides a readymade collateral management framework without which central banks would not be able to implement monetary policy so efficiently in normal market conditions and act as lenders of last resort so swiftly during periods of market turbulence.
- 2.1.5 **Extending a financial safety net.** In a financial crisis, unsecured lending evaporates. Vital access for creditworthy financial intermediaries to residual market liquidity is sustained through collateralised transactions in the repo market. Although the repo market was not immune to the disruption triggered by the default of Lehman Brothers, it did not suffer a seizure and has helped to avoid total and unsustainable dependence on central bank liquidity.
- 2.1.6 **Integrating financial markets.** Cross-border market integration creates economies of scale for financial intermediaries, permits wider diversification of risk by investors and opens up new funding opportunities for issuers. However, cross-border financial transactions involve more remote and complex lending relationships. The collateralisation of risk in the repo market has accordingly been essential to the growth of cross-border activity.
- 2.1.7 **Hedging and pricing derivatives.** The use of repo to fund long positions and cover short positions in underlying securities is fundamental to the pricing and hedging of derivatives, which are the essential tools of risk management for both financial intermediaries and end-users of the financial markets, including official debt and reserve

management agencies. Indeed, an active repo market is an absolute prerequisite for liquid markets in derivative instruments. Attempts to establish new derivatives markets, exchange-traded and over-the-counter (OTC), have floundered where there have been no active repo markets.

2.1.8 **Hedging primary debt issuance.** Repo is pivotal to an efficient primary market for debt securities. Primary dealers and other underwriters rely on the repo market to hedge the underwriting risk on both government and corporate debt, and to manage the new issue process efficiently. A long position in a new issue can be hedged by taking an off-setting short position in an existing issue with similar risk characteristics. The delivery of securities into the short position is covered by borrowing in the repo market. Alternatively, a long position in a new issue can be hedged by taking a short position in a derivative instrument such as a bond future or interest rate swap. However, this short derivatives position will ultimately be hedged by someone else in the market taking a short position in the underlying security (derivatives merely transfer the need to go long or short of the underlying to another party), which also means borrowing in the repo market. The ability of primary dealers and other underwriters to efficiently distribute new issues would be seriously constrained without access to a liquid repo market, and the cost and risk of issuance would be increased and passed directly to issuers. The primary market function of repo will become increasingly important over the next few years, given the quantity of debt which European governments, banks and corporates are expected to issue.

2.1.9 **Ensuring liquidity in the secondary debt market.** Liquidity in the secondary market for securities depends upon primary dealers and other market-makers being willing:

- To quote selling prices continuously to investors, even for issues which they do not hold in their inventory and cannot or do not wish to purchase immediately from someone else in the market. If an investor buys such an issue, the market-maker can only be sure of his ability to deliver to the investor if he is able to borrow that issue in the repo market. The alternative would be for the market-maker to hold larger inventories, which would raise the cost of market-making and therefore the cost of debt to issuers and investors.
- To quote buying prices continuously to investors. This relies on the ability of market-makers to hedge temporary accumulations of long positions by taking short positions in issues with similar maturities, which means borrowing in the repo market.

Without the ability to cover the temporary short positions created by selling issues not held in inventory, as well as the deliberate short positions taken to hedge temporary long positions, market-making would be constrained to a rigid matched-book style of activity and secondary market liquidity would suffer. Portfolio management by investors would be made more difficult and debt securities would become a less attractive investment.

- 2.1.10 **Fostering price discovery.** The enhanced liquidity generated by repos in the primary and secondary markets for securities helps equilibrate imbalances between the supply and demand of securities, and facilitates their correct valuation, which generates the smooth and consistent yield curves that are essential for the accurate pricing of other financial instruments, and thus the efficient allocation of capital by financial markets.
- 2.1.11 **Preventing settlement failures.** Repo plays a mundane but nonetheless critical role in supporting the day-to-day operational efficiency of securities markets by allowing issues to be borrowed in order to ensure timely onward delivery, where short positions have arisen unintentionally, because of unexpected lags between inward and outward deliveries of securities, or the tight supply of particular issues.
- 2.1.12 **Permitting faster settlement times.** The role of repo as a means of borrowing securities has been, and will continue to be, crucial in allowing settlement periods to be shortened in order to reduce systemic risk in securities settlement systems. Faster settlement leaves less time for operational errors to be corrected and therefore requires an efficient source of securities borrowing to prevent delivery failures.
- 2.1.13 **Allowing more efficient collateral management.** Trading in the repo market is key to the valuation and management of collateral, and therefore to the liquidity which allows collateral resources to be fully mobilised and efficiently allocated. Collateral management is becoming ever more important. Demand for collateral for use in payments and settlement systems, as well as in the exchange-traded and OTC derivatives markets, is being compounded by regulatory pressure on market users to hold larger liquidity reserves and make greater use of (collateralised) central clearing counterparties (CCPs), at the same time as a loss of confidence in sovereign debt is creating uncertainty over the future supply of high-quality collateral.
- 2.1.14 **Allowing more efficient employment of capital.** The global economic impact of the increasing regulatory risk capital charges introduced since the 1980s was mitigated by the more efficient use of capital that was allowed by the underlying shift from unsecured to secured financing. The capital efficiency of repo will become even more important in the future as regulators increase capital charges and impose new liquidity requirements.

3 The ‘special’ repo market

- 3.1 The repo market performs both money market and capital market functions. On the one hand, it is a market for the short-term borrowing and lending of cash. On the other hand, it is a market for the borrowing and lending of securities (in

this respect, performing the same function as the securities lending market).² The same repo transaction can perform both functions simultaneously, with one party motivated by the need to borrow cash and the counterparty by the need to borrow securities. However, money market and capital market repos are generally distinguished by price differences.

- 3.2 The terms of a repo performing a primarily money market function will be driven by the supply of and demand for secured cash. The precise identity of the collateral securities will be a secondary consideration. There is a tacit list of securities (the so-called “GC basket”) between which the majority of repo dealers are more or less indifferent when collateral is offered for cash-driven repos. The focus on cash rather than the identity of the collateral in such repo transactions means that the cash will be priced at a broadly uniform rate of return for each maturity called the “GC” or “general collateral” repo rate. This is a money market rate of return and is accordingly closely correlated with unsecured money market rates.
- 3.3 In contrast, the terms of a repo performing a primarily capital market function (analogous to securities lending) will be driven by the supply of and demand for a particular security. If demand is strong enough relative to supply, such a transaction will be distinguished by a repo rate significantly below the prevailing GC repo rate for the same maturity, as potential buyers compete to borrow this security by offering cheaper cash to potential sellers. Such securities are said to have gone “on special” in the repo market. Special repo rates are a normal market-clearing price mechanism which helps to rebalance supply and demand. The offer of cheap cash represented by a special repo rate serves to attract an additional supply of securities into the market, and at the same time makes it more expensive to borrow, thereby cooling the demand.³
- 3.4 The differential between the prevailing GC repo rate and the special repo rate on a particular security represents an implicit borrowing fee for that security. The size of an implicit borrowing fee in the special repo market should be equivalent to the explicit fee being charged for the same security in the parallel securities lending market.

² Although parties are described as “borrowing” securities in the repo and securities lending markets, this is purely functional terminology. In legal terms, in a repo, the borrower is buying legal and beneficial title to securities (collateral) against cash, while in a securities lending transaction, the borrower is receiving legal and beneficial title to the borrowed securities in exchange for giving legal and beneficial title to other securities or cash (collateral). However, although legal and beneficial title is transferred in both cases, repos and securities lending transactions include a simultaneous agreement to repurchase or re-exchange for the same or similar securities at the end of the transaction. Accordingly, a repo seller and a securities lending borrower have only temporary use of the securities and can be said to have “borrowed” them, even though they have legal and beneficial ownership during the term of the transaction. Borrowing from the repo market is done through a “reverse repo”. This term merely identifies that the borrowing party (the buyer) is buying or “reversing in” collateral securities, as opposed to its counterparty (the seller), who is selling or “repoing out” those securities.

³ The cheap cash that has to be offered for a security which is on special in the repo market means that a party borrowing that security is incurring an implicit cost. The more special the security, the greater the implicit cost.

- 3.5 If the level of the GC repo rate is low enough and the demand to borrow a particular security is high enough, special repo rates can go negative. For example, a GC repo rate of 1.00% and a borrowing fee for a particular security of 200 basis points implies a special rate for that security of -1.00%. The repo market is unique in offering natural negative rates. Negative repo rates can occur frequently in low interest rate environments (as the GC repo rate will be closer to zero) and can be routine for government securities which are “on the run” or “cheapest to deliver” in the bond futures market.⁴
- 3.6 Negative repo rates are not the manifestation of a dysfunctional market. They simply reflect the size of implicit borrowing fees for particular securities. If such fees are acceptable in explicit form in the securities lending market, they should be equally acceptable in implicit form in the repo market. The fact that borrowing fees sometimes translate into negative repo rates is simply a function of arithmetic and generally low interest rates, which are in turn a product of monetary policy. It is not the absolute level of a negative repo rate that is important, but the implicit borrowing fee represented by the spread between the special repo rate on a particular security and the GC repo rate.
- 3.7 Of course, if the borrowing fee implicit in a special repo rate is exceptionally high, this may indicate severe imbalances between supply and demand for a particular security. Such imbalances may reflect lack of supply of a particular security, possibly due to market instability, and/or the intensity of demand. In many markets, these problems are relieved by issuers increasing the supply of scarce securities by means of:
- permanent issuance and sale of additional securities (re-openings or taps);
 - temporary issuance and lending of additional securities (“synthetic” or “phantom” bonds --- see the box);
 - releasing supply reserved for this purpose at issuance.

⁴ An “on-the-run” security is one that is used by the market to benchmark the cost of borrowing for an issuer for a particular term to maturity. They tend to be the latest issue of securities close to terms such as 5 and 10 years, and will typically be the largest and most liquid issues. The bulk of trading in the cash and repo markets takes place in on-the-run issues and the level of demand often forces them on special in the repo market. The “cheapest-to-deliver” or CTD is the security which, for reasons of relative cost, is the one which the sellers of bond futures contracts prefer to use to fulfil their delivery commitments in the futures market. Sellers have a choice of securities which they can deliver to settle bond futures contracts --- a so-called “basket of deliverables” specified by the futures clearing house --- but rigidities in the contractual method of determining how many of each deliverable security is required to settle one futures contract means that the required amount of some issues cost less to buy than the required amount of others: the cheapest-to-deliver is the deliverable issue for which the required amount costs the least to buy.

“synthetic” or “phantom” bonds

Such bonds are the product of the temporary issuance of government securities by an official debt manager, to be used in lending (through a repo facility, therefore against cash) to primary dealers or designated market-makers in order to allow these firms to cover short positions arising from their market-making operations and avoid delivery failures to investors.

The ability of official debt managers to repo out specific issues to the market is designed to dissuade manipulation of the market in those issues, by reducing the prospect of excessive returns and to address instances of market disruption or dislocation, when a particular issue is temporarily in extremely short supply. Such repo facilities are offered in Belgium, Portugal, the Netherlands and the UK. The charge for lending can be a fixed penalty rate (Belgium and Netherlands) or decided on a case by case basis (Portugal).

In the UK, the official debt manager (DMO) offers a Standing Repo Facility to Gilt-Edged Market-Makers (GEMMs). GEMMs may request that the DMO repos any liquid gilt issue to them for re-use in the interdealer repo market. This may involve the temporary creation of the relevant gilt. The counterparties involved remain anonymous to the market. The facility is available from 12:30pm London time on the previous day up until 11:30am on the day of settlement. Use of the facility may be rolled over daily, but the DMO is unlikely to allow use to continue for more than two weeks. The DMO charges a penal overnight rate equivalent to 300bp below the Bank of England’s Bank Rate, subject to a floor of 0.10% pa.

At the same time as reposing out a gilt through the Standing Repo Facility, the DMO will normally insist on a back-to-back reverse repo of other gilt collateral, at Bank Rate, in order to neutralise the effect of the standing repo on government funding requirements and its own cash management operations.

If there is sufficient evidence of severe market-wide disruption or dislocation, the DMO may vary the terms of the Standing Repo Facility, including the repo rate, which may or may not be penal (eg in May 2009, the DMO offered a special 1-week repo facility in two issues at a repo rate of 0.15% pa).

In the Netherlands, the official debt manager (DSTA) offers a repo facility to Primary Dealers to borrow government securities at any time, up to an outstanding volume of EUR 10 billion. Primary Dealers pay a premium of 25 basis points for this facility. In Portugal, the debt management agency offers a repo facility to market-makers on a case by case basis.

4 The role of short-selling

4.1 Strong demand for a particular security in the repo market, as reflected in special repo rates, is a measure of the need to cover short positions in the “cash” market.⁵ A short position is created by the sale of a security in the cash market by a party who does not own that security and borrows rather than immediately buys the security in order to make delivery. The sequence of establishing and running a short position is as follows:

⁵ The “cash” market is the market in which securities are sold or purchased outright, ie with no commitment by the seller to repurchase equivalent securities from the buyer at a later date (as in the repo market).

- A party (the short-seller) sells a security which he does not hold in his inventory to another party in the cash market.
- In order to fulfil his commitment to deliver the security to his cash market counterparty, the short-seller borrows that security from either the repo market or securities lending market. This borrowing can be done before or after the short sale. The short-seller will use the cash proceeds from the short sale to the cash market to fund his repo or securities loan (ie he will give the cash proceeds in exchange for the security).
- When the short-seller eventually decides to close out his short position, he will have to re-enter the cash market to buy back the shorted security, in order to return it to the repo or securities lending counterparty from whom he borrowed it.

4.2 Short positions are not riskless. While the short-seller is running his short position, he is exposed to the risk that the price of the security may rise, in which case, he will have to buy the security back at a price higher than he sold it, which will mean a capital loss. A short position is riskier than a long position since the maximum capital gain on a short position is limited to the price of the security (given that its price could in theory fall to zero before he buys it back), while the maximum capital loss is infinite (given that there is in theory no limit to the rise in the price of the security).

4.3 In addition to the risks on a short position, a short-seller faces a net running cost. While the short position is open, the short-seller will accrue a daily loss at a rate equal to the coupon on the security, since the daily accrual of coupon interest on the security will add to the eventual cost of buying it back.⁶ However, this loss of accrued interest will be offset to some degree by the accrual of a return on the cash given to the repo or securities lending counterparty, which should earn the special repo rate on the security being borrowed. The differential between the coupon rate and the repo rate is called the “cost of carry”. Given that coupons are typically larger than repo rates (because coupons are for longer maturities than repos and yield curves are usually positive), the cost of carry on most securities is a net loss to short-sellers (ie they are losing more coupon interest than they are earning on their repos or securities borrowing).

⁶ When one sells a fixed income security, the sale proceeds are equal to the so-called ‘clean price’ quoted in the cash market plus one’s share of the next coupon payment, which is called the “accrued interest” on the security. A seller is entitled to this accrued interest because it is assumed he has held the security since the last coupon payment date and should be compensated for taking the risk on the security over that period. To illustrate what happens in the case of a short position, consider the example of a security paying an annual coupon being sold short 91 days after the last coupon payment. The sale proceeds will include approximately one quarter of the next coupon payment. If the short position was run for 7 days, the short-seller would be buying the security back from the cash market 98 days since the last coupon payment and the amount he would have to pay to buy the security would be equal to its new clean price plus 98 days of accrued interest. This means the short-seller would have paid a net 7 days of accrued interest to run the short position. He may be lucky and find that the clean price of the security has fallen sufficiently for him to make a capital gain that more than offsets the accrued interest. On the other hand, he may be unlucky and make either an insufficient capital gain or even a capital loss.

- 4.4 A short-seller may incur additional running costs if he is unable to locate the security in the cash market when he tries to buy it back. In this case, he will be unable to return the security to his repo or securities lending counterparty. Lack of supply is such a significant risk in the case of illiquid securities like corporate bonds that short-selling is rare. However, difficulties are also likely to be experienced in closing out short positions in more liquid securities if prices rise sharply and cause a collective rush of short-sellers into the cash market to buy back securities, in what is known as a “short squeeze”. The cost of a delivery failure is discussed in section 6 below.
- 4.5 Because the risks involved in running a short position are greater than those in running an equivalent long position, and because of the running costs, short-selling is not a casual activity and short positions will always be opened cautiously.
- 4.6 Selling something one does not own may sound counterintuitive but short-selling is a fundamental trading technique which performs an essential function in the financial markets. The reasons for taking short positions include:
- 4.6.1 Market-making --- It has been explained that, if market-makers in securities quote selling prices continuously --- allowing investors to buy securities on demand --- they will often have to sell issues to investors which they do not hold in their inventory and which they cannot or do not wish to buy immediately from others in the market.⁷ The lag in buying creates a short position. Similarly, if market-makers quote buying prices continuously --- allowing investors to sell securities on demand --- they will often accumulate long positions which they cannot or do not wish to immediately sell back to the market. Instead, they may wish to hedge these long positions and will do so by taking short positions in issues with similar maturities. Debt management agencies universally recognise the need of market-makers to be able to take short positions and, as mentioned already, often provide special repo facilities to facilitate short-covering where the market cannot satisfy borrowing demand.
- 4.6.2 Hedging --- A short position in one security is taken to provide an equal and opposite risk to a long position in another security or in a derivative such as a futures contract or an interest rate swap, so that changes in the value of the long position are substantially offset by opposite changes in the value of the short position in response to the same underlying price movement.
- 4.6.3 Arbitraging --- Creating what appears to be a long position hedged by a short position but where there is a riskless profit to be extracted from the difference in the costs of the two off-setting positions.

⁷ Market-makers may defer buying securities to cover short positions due to lack of supply in the cash market, pressure of other business, anticipation of the imminent delivery of the same securities from the settlement of other transactions and expectations of favourable price movements.

4.6.4 Trading ---

4.6.4.1 Anticipating a fall in the price of a security by taking a short position, with the intention of buying back later at a lower price. Such short-selling can be motivated either by:

- considerations of relative value, where the price of a security is out of line with comparable securities but is expected to move back into line;
- views on absolute value, where all the securities from a particular issuer are seen as overvalued.

4.6.4.2 Anticipating a divergence or convergence in the prices of related instruments by taking combinations of matching long and short positions:

- “spread” trades between two securities with the same maturity, or between a security and a derivative instrument, to profit from the expected divergence or convergence in the levels of two yield curves;
- “yield curve” trades between two or more securities at different points on the same yield curve, to profit from an expected change in the slope or shape of the curve.

4.7 All these short-selling activities are key to efficient price discovery, the accurate valuation of financial assets and the prevention of asset price bubbles (markets without short-selling are much more prone to bubbles). Short-selling also generates valuable liquidity for other users of the financial markets. It is therefore a legitimate and desirable market activity, and there is an essential symmetry of function between long and short positions.

4.8 It is sometimes alleged that short-selling is intrinsically destabilising in that, more than any other trading activity, it can exacerbate financial crises by unduly amplifying price falls, fuelling price volatility and creating settlement failures, thereby contributing to disorderly markets and threatening financial stability. The evidence however tends to point the other way. Studies in the equity market have shown that bans on short-selling have been followed by steeper price falls, increased volatility and wider bid-offer spreads. It is also the case that overshooting prices, price volatility and settlement failures can occur when prices rise rapidly on a wave of exuberant buying. In other words, the buying and selling of long positions can disrupt markets, and given the relative scale of long and short positions, the liquidation of long positions is likely to be a far more serious driver of falling prices. On the other hand, short positions may put a floor under prices which are falling as a result of long positions being liquidated. Short-sellers eventually have to re-enter the market as buyers. They will do so when prices reach target levels and will be incentivised to do so by the cost of running short positions.

4.9 Even ignoring the possibly perverse consequences of regulatory restrictions on short-selling, the likely cost, in terms of long-term damage to market efficiency and liquidity, of permanent restrictions on what is generally a legitimate and desirable market activity seem disproportionate to the infrequent problem of

market disruption, even when those episodes are severe. Unusual events should be managed with special measures.

- 4.10 It is also questionable whether short-selling restrictions would be effective in the case of securities on which derivatives such as bond futures are available, given that these instruments provide an alternative means of taking short positions.
- 4.11 Concern about short-selling has prompted proposals for increased transparency, specifically a regulatory requirement that market users should publish or report their short positions. In largely institutional securities markets which are well served by publicly-quoted, exchange-traded derivatives, it is unlikely that lack of public information on short positions hinders the incorporation of negative expectations into prices. There is therefore no real market need for greater transparency about short-selling. Indeed, immediate public disclosure of short positions is likely to have an adverse impact on liquidity by causing market users to reduce the size of their positions.
- 4.12 There may be a case for more information to be provided confidentially to regulators about the scale of short-selling in the fixed-income market, in order to allow the monitoring of systemic risk and identification of potential market abuse. The most appropriate measure for regulatory purposes would be net short positions, ie short positions net of short covering. While net shorts positions would overstate intentional short-selling (given that some net short positions would be uncovered only because of difficulties in borrowing), the changes in this number would allow regulators to gauge the likelihood of abusive short-selling. There would seem little harm in publishing aggregated data on gross short positions after a suitable delay.
- 4.13 It has also been suggested that limits should be imposed by regulators on short positions. In terms of policy, such a suggestion ignores the symmetry of function between long and short positions, and betrays an inflationary bias against price falls which assumes short-selling to be inherently undesirable. In practice, the implementation of limits would be fraught with problems. It would be difficult to fix the boundary between acceptable and unacceptable short positions, and therefore set limits that do not constrain market liquidity. Such limits would also have to be global (ie one limit per institution), given the functional fungibility of financial instruments.⁸ However, global limits are unlikely to be able to restrain the short-selling of particular securities to the extent that might be desired by regulators.

⁸ Risk positions and hedges are established using the most liquid instrument which has broadly similar risk characteristics to the type of risk being taken or hedged (liquid securities in place of less liquid issues, derivatives in place of securities, and one type of derivative in place of another). Where possible, the position or hedge is then gradually switched from the “proxy” instrument into a less liquid instrument with more precisely matching risk characteristics.

5 Uncovered short-selling

- 5.1 During recent episodes of market turbulence, particularly after the failure of Lehman Brothers and during the financial crisis in Greece, political attention has been focused on uncovered or “naked” short-selling, where a short sale of a security is made before being covered by borrowing. The traditional concern with uncovered short-selling is the belief that it permits unlimited selling of a security, allowing speculative forces to massively leverage negative sentiment and thus manipulate the market.
- 5.2 It is incorrect to assume that all uncovered short positions are trades with an abusive intent. Abusive uncovered short-selling is where the seller has no intention of borrowing and delivering the securities he has sold short. Attempts to prohibit abusive/intentional uncovered short-selling by means of a regulatory requirement that borrowing should always precede short-selling make the mistake of assuming that the relative timing of short-selling and short-covering is a reliable indicator of intent. Many, if not most, uncovered short positions are either temporary or unintentional.
- 5.2.1 Temporary uncovered short positions arise routinely where short-selling is covered retrospectively. There are sound reasons for such delays. Establishing a short position is more urgent than covering that position, because of the need to contain the market risk on the short position. On the other hand, a short position can be covered at any time until settlement, so there is inherently no rush. Indeed, because repos settle at T+2 or sooner, while most fixed-income securities settle at T+3, short-covering in the repo market could quite properly be delayed for a day. In practice, however, the bulk of temporary uncovered short positions are only intraday.
- 5.2.2 Unintentional uncovered short positions are the result of short-sellers being unable to cover their positions because their attempts to borrow securities have been frustrated by market illiquidity, or because the counterparties from whom they have borrowed have failed to deliver to them, also as a result of market illiquidity or due to operational error interrupting settlement.
- 5.3 A “pre-borrowing” regulation is not needed to address temporary uncovered short positions, as they are not a problem, nor is it a sensible way of addressing unintentional uncovered short positions, as it does not address the causes and there are better solutions (see sections 6 and 7 below). Moreover, a pre-borrowing regulation would impose undesirable costs on all market users.
- 5.3.1 There would be a direct cost from a pre-borrowing regulation that would arise because enforcement of such a regulation would require the imposition of a detailed reporting regime on market users. Although primary dealers and other designated market-makers would have to be exempted from the pre-borrowing requirement, they could not prudently be exempted from the reporting requirement, so the cost of market-making and of government debt would be adversely affected.

- 5.3.2 There would also be an indirect cost from a pre-borrowing regulation, as a consequence of the fact that such a regulation would effectively prohibit all delivery failures, whatever their cause. This would have the serious unintended consequence of constraining all selling activity, both short-selling and the liquidation of long positions. Legitimate short-selling would be especially affected, given the occasional uncertainty about the supply of securities available for borrowing, but the prohibition is likely to constrain even the liquidation of long positions, as market users would need to ensure that securities being financed in the repo market were delivered back to them in time for onward delivery. In addition to costly delays in completing transactions, there is likely to be wasteful “over-borrowing”. A pre-borrowing regulation would therefore damage the efficiency of financial markets, reduce liquidity and raise the cost of financial services to both issuers and investors.
- 5.4 The costs of a pre-borrowing requirement need to be considered against the likely scale and frequency of the practice it is supposed to be eliminating. There is no evidence that intentional uncovered short-selling is a significant activity. While it is not possible to specifically measure intentional uncovered short-selling, we can fix an upper limit to the scale of the problem by looking at the statistics on settlement failures, given that intentional uncovered short-selling will always result in a failure to deliver.
- 5.5 Consider the efficiency of cross-border settlement between the International Central Securities Depositories (ICSDs), Euroclear and Clearstream, who tend to be the settlement agents for international market users, and national CSDs, who tend to be the settlement agents for domestic market users. ICSD-CSD links have traditionally been the weakest links in European settlement. Settlement between a client of Euroclear on the one hand and clients of the CSDs in France, Germany and the UK on the other hand, as measured by the number of successfully settled instructions per month over the turbulent period from January 2008 to May 2010, averaged 97.6% (97.3% for France, 98.7% for Germany and 96.8% for the UK), varying between 96.2% and 99.3%. These are high rates of settlement. Given that many of the failed settlements would have been unintentional, ie caused by operational errors or market illiquidity, the likely rate of intentional uncovered short-selling must be very low. Nor did settlement efficiency between Euroclear and these CSDs deteriorate over this period. There is a case to be made that intentional uncovered short-selling is more a hypothetical than a real problem.
- 5.6 Given that intentional uncovered short-selling is not a substantial activity and that serious collateral damage is likely to be caused to the market by the imposition of a pre-borrowing requirement, such a blunt regulation would be a disproportionate response. Instead, as intentional uncovered short-selling is a form of market abuse, it should be treated as such and dealt with by applying existing market abuse regulations. The amendment of those regulations to specifically cover short-selling is not appropriate. Although short-selling can be used by market abusers, so can any other financial instrument. As a matter of

principle, market abuse regulations should focus on the misuse of instruments, not the instruments themselves, particularly given that intentional uncovered short-selling is likely to be just one element in a more general pattern of abusive market behaviour

- 5.7 However, perhaps the most important point to make is that prohibitions on uncovered short-selling of fixed income securities are generally unnecessary, because there are already market mechanisms in place that, in normal circumstances, are very effective in deterring intentional uncovered short-selling and in reducing unintentional uncovered short-selling.

6 Failure to deliver in the repo market

- 6.1 While intentional uncovered short-selling, by definition, results in delivery failure, the problem of delivery failures in Europe is not a reflection of short-selling. It has already been noted that there are more routine reasons:
- Operational errors originated by personnel within the front or back offices of counterparties, such as incorrect, incomplete or late settlement instructions. The vast bulk of settlement failures is believed to originate in such operational errors. The ability to correct these errors can be constrained by the poor technical design of settlement systems and the rigid business practices of CSD (see the next section).
 - Operational failures in systems and communications, eg power outages.
 - A scarcity of a particular issue in the market, particularly in hectic market conditions, frustrating attempts by short-sellers to borrow in order to cover their short positions.
 - Barriers to interconnectivity between CSDs and ICSDs which obstruct the efficient transfer of securities cross-border.
- 6.2 Failures occur in the settlement of both the cash and repo transactions. They may take the form of permanent, late or partial delivery. Late delivery may include delivery on the scheduled settlement date, but too late for an agreed processing cycle within the settlement system.

Factors reducing delivery failures

- 6.3 Parties involved in chains of transactions who fail to receive securities on one side can avoid failing on the other side by borrowing. The problem of delivery failures can therefore be reduced by providing access to liquid repo and securities lending markets. All European countries have repo markets, but not all have securities lending markets. While repo performs an analogous function to securities lending, the overlap is not total. Securities lending is the preferred market for equity, and some lenders prefer securities lending to repo, for reasons such as the impact of cash on their balance sheets and the expense of signing another legal agreement in order to transact repo. The lack of liquid securities lending markets is particularly noticeable in countries such as Greece, Italy and Spain, where international market users have expressed concern about the difficulties of cross-border settlement into local CSDs.

- 6.4 The automatic agency securities lending facilities offered by the ICSDs play a particularly useful role in reducing delivery failures in the cross-border market (contributing in the region of 5% to settlement efficiency). Users who sign up to these facilities are able to demonstrate to regulators that they intend to deliver and are not engaging in unintentional short-selling. Moreover, because the ICSDs charge fixed borrowing fees, users cap the risk of borrowing at reasonable levels.
- 6.5 The scope for delivery failures is being continuously reduced by the adoption of new market technologies in the form of:
- 6.5.1 Electronic repo trading --- which centralises trading and therefore tends to avoid the formation of chains of transactions. The matching function intrinsic to electronic trading also assists in reducing the scope for delivery failures by precluding mismatched settlement instructions. Electronic trading currently accounts for about 28% of the value of outstanding European repo contracts (ICMA survey, December 2009).
- 6.5.2 CCPs (usually attached to electronic trading systems) --- which can eliminate the operational sources of delivery failures by matching transaction details and identifying errors before settlement, as well as by cutting chains through multilateral netting (eg if A sells to B, who sells to C, who sells to D, a CCP would limit the effect of a delivery failure to A and D by netting out B and C). CCPs handle about 19% of the value of outstanding European repo contracts, mostly electronic trades (ICMA survey, December 2009).
- 6.5.3 Tri-party repo --- which eliminates delivery failures entirely, as collateral is selected on behalf of repo sellers by tri-party agents only if it is available in the account of the seller. Tri-party repo also allows more effective and flexible use of collateral resources. It accounts for about 8% of the value of outstanding European repo contracts, although it has been as high as 12% (ICMA survey, December 2009).
- 6.6 Most cash and repo markets in Europe have well-established and generally-accepted conventions, actively promoted by the ICMA's European Repo Council (ERC), the International Capital Market Association (ICMA) and the Association for Financial Markets in Europe (AFME), which, in normal market conditions, successfully contain delivery failures by creating compelling economic incentives for market users to avoid or cure such failures. To understand these conventions, consider the following scenarios:
- A seller fails to deliver in a cash transaction.
 - A repo seller fails to deliver at the start of a repo.
 - A repo buyer fails to deliver at the end of a repo.

Failure to deliver in a cash transaction

- 6.7 In the cash market, if an outright seller fails to deliver a security to an outright buyer:

- The buyer should withhold or recover his cash payment.⁹
- As the buyer has contractually become the legal owner of the security, he holds a long position in that security, which means that he will start to accrue coupon interest on the security.¹⁰
- The position of the seller will be a mirror image of that of the buyer. He holds a short position in the security. As the seller will, at some stage, have to buy the security in order to fulfil delivery (or make an equivalent settlement of claims --- see section 6.23), the daily accrual of coupon interest on the security will add to his eventual cost of purchase.¹¹

6.8 While the failure to receive a particular security may be inconvenient to the buyer, the immediate financial consequences are positive for him, providing compensation which should cover or at least reduce the cost of borrowing the security, if he wished to do so.

6.9 At the same time, the accrual of coupon interest on the security represents an accrual of loss to the seller. This provides an incentive for him to cure the delivery failure by borrowing the security from the repo or securities lending markets and paying a borrowing fee up to the equivalent of the accrued coupon interest.

Failure to deliver by a repo seller at the start of a repo

6.10 In the repo market, in the case of a failure by a repo seller to deliver collateral securities at the start of a repo, the generally-accepted market convention operates as follows:

- Despite the delivery failure, the repo is not automatically cancelled.
- The repo buyer will withhold his cash from the repo seller or, if he has made payment, he will immediately recover it.¹²
- The repo seller is able to deliver the collateral securities to the repo buyer at any time during the contract period. If and when the repo seller delivers, he will be entitled to receive the original cash amount of the contract for the remainder of the original contract period.

⁹ If the settlement system operates on a delivery-versus-payment (DVP) basis, no cash will be paid to a seller who fails to deliver a security. If a trade is settled across a system which is not DVP, the seller will have to refund any payment.

¹⁰ It could be assumed that the buyer will reinvest his cash and therefore be compensated with two streams of interest. In practice, however, the buyer was probably planning to borrow the cash to fund the repo, so a fail will simply result in the buyer cancelling his plans to borrow or paying back his borrowing.

¹¹ It is assumed that, although the seller has not received any cash, he will not have to borrow cash to make up the shortfall, as he is not having to fund the purchase of the security (given that he has not been able to acquire it for delivery).

¹² Ideally, the exchange of cash and collateral securities should be DVP, so a repo seller failing to deliver collateral securities should not receive the corresponding cash from the repo buyer. However, if settlement is not DVP and the repo buyer has paid cash without receiving the collateral securities, he is entitled to recover that cash immediately from the repo seller or make a margin call to do so. The repo seller has a compelling incentive to repay this cash promptly. If he does not do so, he can be declared in default of the contract by the repo buyer.

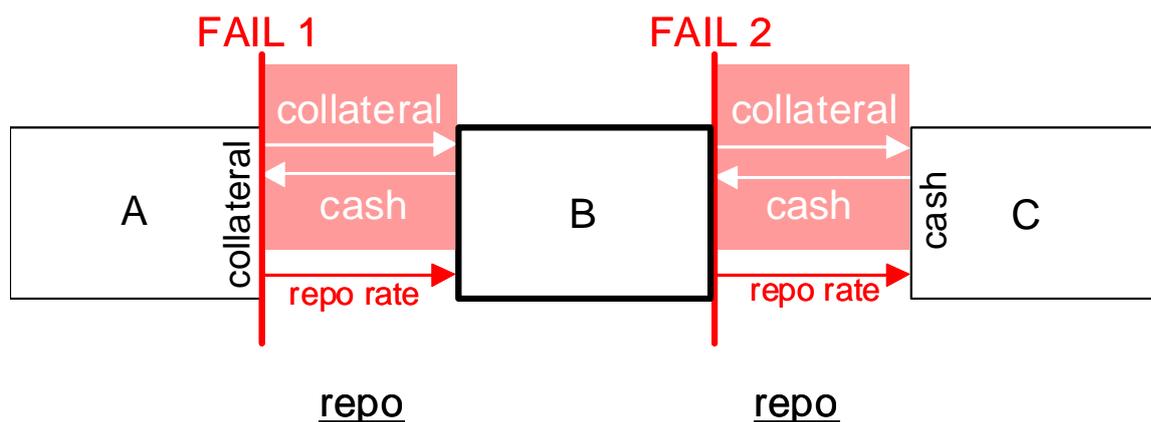
- Whether or not the repo seller makes a late delivery of the collateral securities, and even though he does not receive or cannot keep the corresponding cash payment unless or until he delivers, the agreed repo rate will accrue to the repo buyer each day of the full contract period, as if the repo seller had actually received and had the use of the cash for the whole of the contract period.
- 6.11 While the failure to receive collateral securities may be inconvenient to the repo buyer, the immediate financial consequences are positive for him and provide compensation which should cover or at least reduce the cost of borrowing the security, if he wished to do so.
- 6.12 When interest rates are reasonably positive, the repo seller's unchanged obligation to pay the repo rate to the repo buyer (whether or not he ever actually had the use of the cash and regardless for how long he may have had its use) is a strong incentive on the repo seller to borrow the collateral securities and cure his failure to deliver. He will be better off borrowing the collateral securities from the repo market or securities lending market in order to cure the delivery failure and paying a borrowing fee up to the equivalent of the repo rate.

Failure to deliver by a repo buyer at the end of a repo

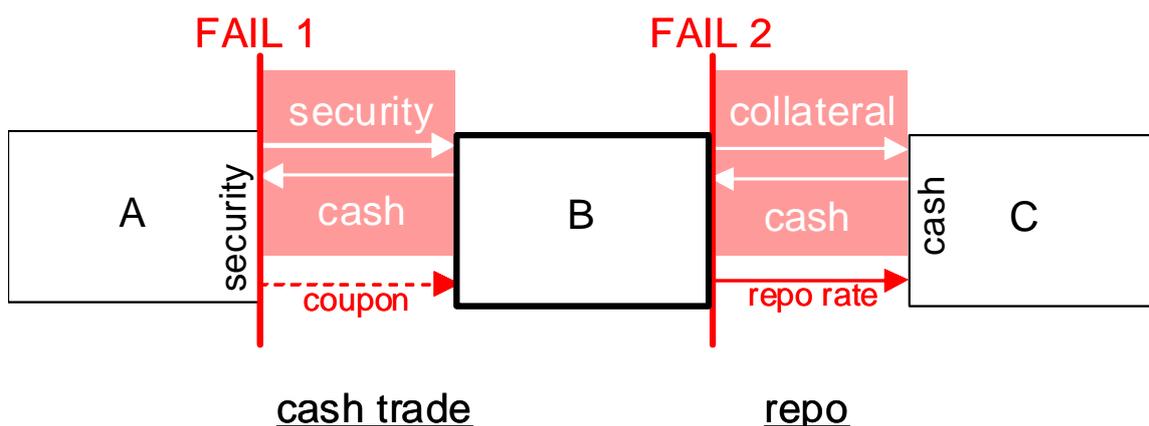
- 6.13 In the repo market, in the case of a failure by the repo buyer to return collateral at the end of a repo, the repo seller will not repay the repo cash and will cease to pay the repo rate to the repo buyer. Instead, the repo seller will reinvest the cash for his own benefit. Accordingly, the repo buyer has an incentive to cure the delivery failure by borrowing the security from the repo market or securities lending market and paying a borrowing fee up to the equivalent of the repo rate that he is foregoing. The repo seller is compensated for the delivery failure by the reinvestment return on the repo cash and could use that compensation towards the cost of borrowing the security himself.

Failures to deliver in a chain of transactions

- 6.14 Market users may find themselves part of a sequence of transactions in which they buy or reverse in securities from one repo counterparty in order to sell or repo them out to another. If the first repo counterparty fails to deliver, the market user may well be forced to fail on the second repo counterparty.
- 6.15 In a chain of repos (see the diagram below), the compensation in the form of the repo rate paid by the first repo counterparty (A) will offset the cost to the market user (B) of failing on the second repo counterparty (C), so the cost of failing and the incentive to remedy the delivery failure falls on the party at one end of the chain who initially failed (A), while compensation for suffering the delivery failure applies to the party at the other end of the chain who ultimately suffered the delivery failure (C).

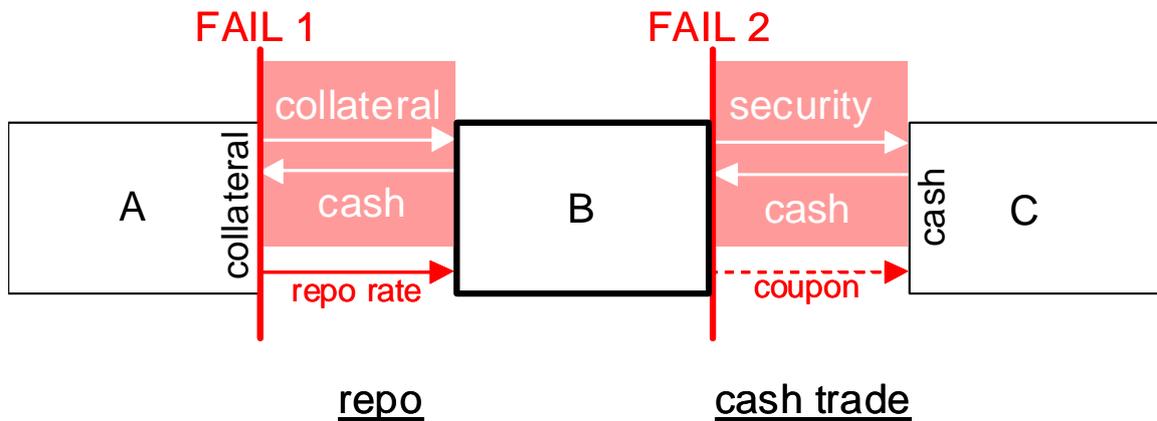


6.16 In a chain in which a party has a cash transaction on one side and a repo on the other (see the diagram below), the same principle applies as in a chain of repos -- the cost of failing and the incentive to cure the delivery failure falls on the party who initially failed at one end of the chain, while the party who ultimately suffered the delivery failure at the other end of the chain is compensated. In addition, however, the economic position of parties in the middle of the chain is preserved. For example, consider a party (B) who has purchased securities in the cash market (from A) and sold them in the repo market (to C), but suffers a delivery failure by A on the cash transaction, which causes him to fail on his repo with C. On the one hand, he will have to pay the repo rate on his failed repo to C. On the other hand, he will hold a long position in the security on the failed cash transaction, which means that he will start to earn the accrued coupon interest on the security. Overall, therefore, he will earn the cost of carry (the differential between the coupon and repo rate), which means that he is in the same economic position as if there had been no delivery failure (the difference being that his profit or loss on the position cannot be realised until delivery is eventually made or there is an alternative settlement of claims).

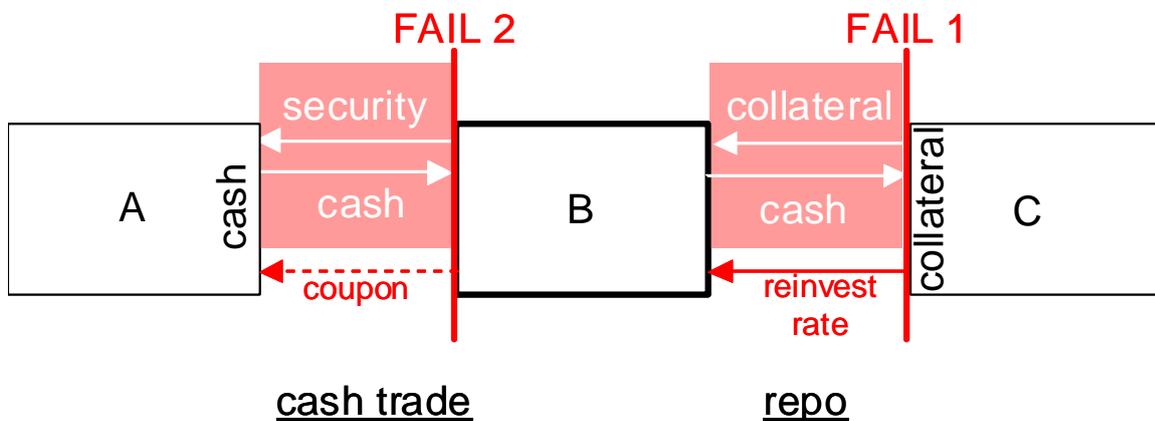


6.17 Next, consider the example (see the diagram below) of a party (B) who has sold securities in the cash market (to C) and bought them in the repo market (from A), but suffers a delivery failure by A on the repo, which causes him to fail on his cash transaction with C. On the one hand, he will hold a short position in the security, which means that he will start to lose the accrued coupon interest on the security. On the other hand, he will earn the repo rate from A on his failed

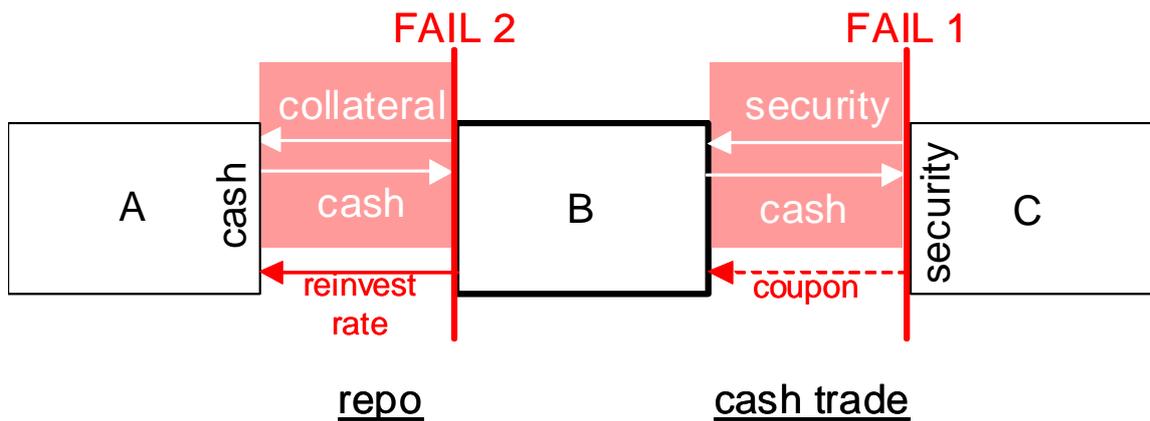
repo. Overall, therefore, he will lose the cost of carry, which means that he is in the same economic position as if there had been no delivery failure.



6.18 Now, consider the example (see the diagram below) of a party (B) who has sold securities in the cash market (to A) that he is due to receive from a maturing repo (with C), but suffers a delivery failure by C on the repo, which causes him to fail on the cash transaction with A. He will not repay the repo cash to C, but will reinvest it for his own benefit. On the one hand, therefore, he will earn a reinvestment return on the cash. On the other hand, however, he will hold a short position in the security, which means that he will start to lose the accrued coupon interest on the security. Overall, therefore, he will lose the equivalent of the cost of carry, which means, as in previous scenarios, that he is in the same economic position as if there had been no delivery failure.



6.19 Finally, consider the example (see the diagram below) of a party (B) who has bought securities in the cash market (from C) in order to use them to settle a maturing repo (with A), but suffers a delivery failure by C on the cash transaction, which causes him to fail on the repo with A. He will not get his cash back from A. On the one hand, therefore, he will have to forego the repo rate that he could have been earning on his repo cash. On the other hand, however, he will hold a long position in the security, which means that he will start to earn the accrued coupon interest on the security. Overall, therefore, he will earn the equivalent of the cost of carry, which means that, as in previous scenarios, he is in the same economic position as if there had been no delivery failure.



6.20 In summary, it can be seen that the generally-accepted market conventions create compelling economic incentives on parties failing to deliver securities in the cash and repo markets to cure their delivery failures, while parties caught within chains of failed transactions suffer no net economic impact. The economic incentives to cure delivery failures in the repo market do however depend on prevailing interest rates being reasonably positive.

Failure to deliver in low and negative interest rate environments

6.21 When interest rates fall to low levels, the economic incentives to remedy delivery failures that are created by the generally-accepted market convention are weakened. If repo rates fall to negative levels, the convention can even produce perverse results. A negative repo rate means that the repo seller (cash borrower) is paid by the repo buyer (cash lender). Therefore, if a repo seller fails at the start of a repo, it is the repo buyer who would have to pay the repo rate and who would be penalised, even though it is the repo seller who has failed. This could encourage repo sellers to enter repo transactions with no intention to deliver, in order to profit from a negative rate (a so-called “strategic fail”).

6.22 In practice, such abusive behaviour has not been reported in the European market. However, the European Repo Council (ERC) of the ICMA felt it was prudent to remove any incentive for strategic fails. It has accordingly issued a recommendation that, in the event a repo seller failed to deliver in a repo transaction at a negative rate, the repo rate would immediately be reset to zero or the repo buyer could terminate that the unsettled repo. At the moment, this recommendation needs to be agreed by parties before each transaction or incorporated into the documentation governing repo transactions between them. This would typically be the ICMA’s Global Master Repurchase Agreement (GMRA), which is the most extensively used cross-border master agreement for repos. However, the recommendation is likely to be integrated into the standard GMRA when this is revised next year.

Contingent remedies for delivery failures in low and negative interest rate environments

6.23 The cash and repo markets have a wide range of additional measures in place that could be employed to deal with widespread delivery failures in exceptional circumstances such as very low or negative repo rates:

6.23.1 A buyer who has suffered a delivery failure in the cash market has the right under conventions sponsored by market bodies such as the ICMA (if agreed by both parties before trading and incorporated into the legal documentation governing their transactions) to “buy in” the undelivered securities and charge the additional cost of purchase to the seller.¹³ In normal circumstances, the right to buy-in is not employed in major government securities markets. It was designed for corporate bonds, for which delivery is particularly important, given that these securities are often subject to corporate events and because their idiosyncratic structures tend to make them unique. Government securities, on the other hand, are not subject to corporate events and are generally fungible, so failure to deliver is not as problematic as with corporate bonds. As a consequence, the potential cost of a buy-in (the difference between the original price and the buy-in price) is seen as disproportionate in the case of government securities and the threat of buy-ins would probably drive market users to reduce the size of their positions, which would impair market liquidity. However, the right to buy-in is a measure to which resort could be made in exceptional circumstances.

6.23.2 In the repo market, in the case of a failure by a repo buyer to return collateral securities to a repo seller at the end of a transaction, the GMRA gives the repo seller the right to terminate the failed repo or force a so-called “mini close-out” on the repo buyer in respect of the unsettled transaction. A mini close-out is broadly similar in effect to a cash market buy-in. However, in practice, mini close-outs are not used in the repo market. This is because the cost of a mini close-out is much larger than the average earnings from repos. The threat of mini close-outs would skew the risk/return trade-off in the repo market to such an extent that market users would probably scale back their involvement, which would reduce market liquidity.¹⁴ However, like the right to buy-in, the mini close-out could be used in exceptional circumstances.

¹³ Under Section 450 of the ICMA’s Rules and Recommendations, a party suffering a fail who wishes to buy in securities that have not been delivered on the scheduled settlement date (F) must serve a buy-in notice on the other party. If the fail is not remedied within three business days (on or by F+5), a buy-in agent is appointed to execute the buy-in on F+5 at the “best available market for guaranteed delivery”. The buyer is entitled to receive compensation for the difference between the buy-in price and the original purchase price. The buyer has to accept a partial delivery of securities.

¹⁴ For example, a 0.05 bid/offer spread on a EUR 100 million security translates to a cost of EUR 50,000, whereas a 5 basis point bid/offer spread on 1-week EUR 100 million repo produces a profit of just EUR 972.

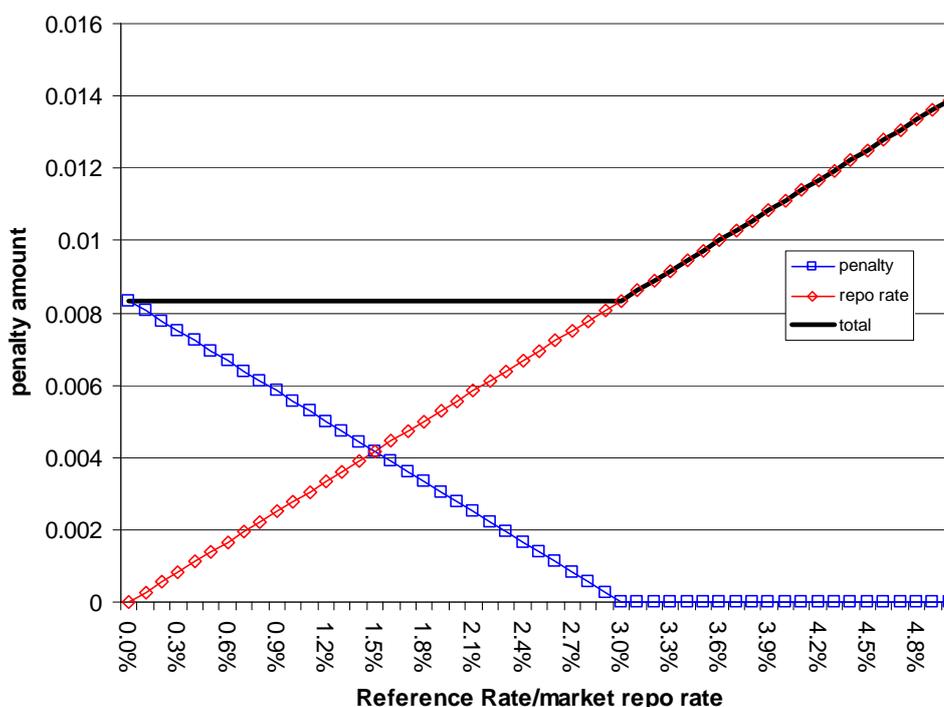
- 6.23.3 Another sanction available in the GMRA against failure to deliver, which could also be employed in exceptional circumstances, is the right by a party to a repo transaction to treat a failure to deliver as an event of default.¹⁵
- 6.24 If further measures were felt to be necessary to deter delivery failures in a low or negative interest rate environment, consideration could be given to the introduction into Europe of a new convention under which market users would charge each other penalties for delivery failures in both the cash and repo markets. Such an initiative was taken in the US Treasury securities market in May 2009, although in response to significantly higher levels of delivery failures than have been seen in European markets.¹⁶ The possibility has been considered as a contingency by at least one CCP in Europe.
- 6.25 A “fails penalty” convention would come into play only when interest rates fall to levels where the economic incentives to cure delivery failures under the existing generally-accepted market conventions start to weaken. Penalties would be calculated according to a formula such as: the greater of zero and the difference between a fixed Threshold Rate and a variable Reference Rate. The calculated penalty rate would accrue daily over the duration of the delivery failure in a cash transaction or, in the case of repos, until the earlier of late delivery or the maturity of the repo. The Reference Rate should be representative of general interest rates. It could be a benchmark money market rate or a central bank repo rate. The rationale for this type of formula is that:
- 6.25.1 Penalties are only needed when general interest rates are very low and would be triggered by the Reference Rate falling below the Threshold Rate. When rates are higher and the Reference Rate is greater than the Threshold Rate, the formula sets to zero (as the difference between the Threshold Rate and Reference Rate would be negative). This means that there would be no penalty for delivery failures in normal circumstances and failing parties would be subject only to the existing economic incentives to cure delivery failures (paying the repo rate in the case of a repo and the accrued coupon interest in the case of a cash transaction).

¹⁵ This has to be agreed beforehand, at the time the GMRA is signed by the parties, as it is an optional event of default.

¹⁶ The US initiative was taken in response to market turbulence which took place in the context of unusually low short-term interest rates and resulted in substantial increases in widespread and persistent delivery failures (following similar problems in 2001, 2003 and 2004). It was promulgated by the Treasury Market Practices Group (a market body sponsored by the New York Fed) as a recommendation that market participants implement a voluntary process of penalties for failure to deliver. The TMPG Recommended Fails Penalty Rate formula is the greater of zero and the difference between 3% and the TMPG reference rate at close of business on the business day prior to the delivery failure. The TMPG reference rate is the lower limit of the Federal Open Market Committee’s target rate for Fed funds. Penalties do not apply to free-of-payment transactions. Claims are settled monthly and there is a minimum penalty of USD 500 per transaction.

6.25.2 The formula would produce a sliding scale of penalties, increasing as the Reference Rate fell towards zero, topping up the decreasing economic incentives and setting a floor under the cost of a delivery failure. The floor can be seen in Figure 1 below. In the case of repos, assuming repo rates are closely aligned with the Reference Rate, this floor would be equal to the Threshold Rate. For example, given a Threshold Rate of 3% per annum and a Reference Rate of 2% per annum, the calculated penalty for a delivery failure would be 1% (the greater of zero and the difference between 3% and 2%). A party failing to deliver at the start of a repo would also have to pay the repo rate of about 2%, making a total of 3%. If the Reference Rate and market repo rates fell to 1%, the fails penalty would be 2% (the greater of zero and the difference between 3% and 1%), so a party failing to deliver at the start of a repo would continue to pay a total of 3%.¹⁷

Figure 1: the relationship between possible fails penalties, the normal economic incentive to remedy delivery failures in the repo market and prevailing interest rate levels



6.25.3 There would also be a ceiling to fails penalties. It is important to cap the exposure of market users in this way or there is a risk of deterring participation in the market. The ceiling to penalties would be equivalent to the Threshold Rate and would be reached when the Reference Rate

¹⁷ The penalty for a failed repo delivery would be the per annum penalty rate accrued daily until the earlier of late delivery or the maturity of the repo. The penalty for a failed delivery on a cash transaction would be the per annum penalty rate accrued daily until the delivery failure was remedied. The formula would be $\text{penalty} = \text{repo purchase price/bond dirty price} \times \text{MAX}[0, (\text{Threshold Rate} - \text{Reference Rate}) * D / (B * 100)]$ where D = day count and B = money market annual basis (360 or 365).

touched zero. At this point, the penalty would be 3% (ie the greater of zero and the difference between 3% and 0%). At this level, a party failing to deliver at the start of a repo would not have any economic incentive to remedy the delivery failure under the generally-accepted market convention (since the market repo rate he owes would be zero). The entire incentive to cure the delivery failure would be provided by the penalty. As the Reference Rate could not fall below zero (only special repo rates can go negative), the formula would never generate a penalty greater than 3% (the greater of zero and the difference between 3% and 0%).

- 6.26 If it was decided to introduce a fails penalty convention in Europe, the following issues need to be considered:
- 6.26.1 US experience with the TMPG recommendation. This appears to have been positive but a closer look would be warranted.
 - 6.26.2 The position of the cash market in Europe.
 - 6.26.3 The convention would need to apply across all the repo and cash markets in Europe, in order to ensure that parties caught in a chain of delivery failures are not unfairly treated by having to pay a fails penalty to the counterparty on whom they fail without receiving equal compensation from the counterparty who fails on them. Where transactions are cleared through a CCP, the CCP (as a party to such transactions) would need to impose the same penalties.
 - 6.26.4 The convention would need to be sponsored by a range of market associations and informally supported by regulators and central banks. The TMPG recommendation had the implicit backing of the New York Fed (FRBNY).
 - 6.26.5 The convention would need to be agreed in writing between repo counterparties. Should it therefore be enshrined in standard legal agreements?
 - 6.26.6 Fails penalties would have to be collected. Is this practicable on a bilateral basis? Could CSDs assist? In the US, penalties for sell-side firms are processed automatically by the FICC (Fixed Income Clearing Corporation). However, as all sell-side firms are users of the FICC, the task is relatively simple in the US. In Europe, not all repo is cleared through CCPs and there are numerous CSDs.
 - 6.26.7 At what level should the Threshold Rate be set? It is 3% in the TMPG formula. It would be sensible to look at the data for delivery failures in Europe and analyse the correlation with general interest rate levels.
 - 6.26.8 What money market rate or index, or central bank repo rate, should be used as the Reference Rate for each European currency?

Other measures to reduce or mitigate delivery failures

- 6.27 The impact of delivery failures can be reduced by the operational measure of “shaping” settlement instructions, which means breaking them down into smaller standard amounts (called “shapes”). The ERC recommends shaping in the European repo market to EUR 50 million. This means that a repo of, say, EUR 250 million would be broken down into five shapes of EUR 50 million. A problem with one of the five settlement instructions would then only cause a delivery failure of EUR 50 million and not the whole EUR 250 million, thereby reducing the accumulation of delivery failures and the risk created by unsettled transactions. Shaping also reduces the liquidity requirements of settlement by allowing a smoother flow of smaller deliveries to be fed through the settlement system.
- 6.28 It has been noted (in 6.5 above) that electronic repo trading and the use of CCPs assist in reducing the scope for delivery failures, in part, by matching settlement instructions, which helps to identify operational errors that could result in delivery failures. The bulk of repo trading is however executed directly rather than electronically and does not clear through CCPs. Nevertheless, a bilateral post-trade pre-settlement matching system is available for directly-negotiated repo transactions in the form of TRAX, now operated by Euroclear/Xtrakter. Non-electronic repo business can also be reported to CCPs retrospectively via multilateral reporting systems: Euroclear’s ETCMS, which uses its own CCP; and a facility created by BrokerTec and MTS which allows directly-negotiated transactions in Italian government securities to be uploaded retrospectively, via the local CSD, into the two CCPs serving that market. Matching facilities also exist for securities lending (Equilend/Pirum and TriOptima). The matching of instructions is particularly valuable in identifying errors in term transactions, where instructions for the closing leg are often delayed, and for transactions requiring adjustments during their life, eg floating rate and open repos.
- 6.29 It would be helpful if the generally-accepted market convention applying to delivery failures at the start of repos --- ie that the transaction is not cancelled and the seller is obliged to pay the full repo rate whether or not he receives the cash --- was universally adopted in Europe. In the French market, if a repo seller fails to deliver at the start of an overnight repo, both legs of the repo are cancelled on the settlement date. The cancellation of unsettled repos means that the party failing is under no contractual obligation to pay the agreed repo rate to the party suffering the fail. There is therefore no economic incentive on failing parties in the French market to remedy delivery failures in overnight repo. In order to restore the economic incentive, the settlement instructions for the opening leg need to be “recycled” within the settlement system (ie automatically re-entered into the next day’s settlement process) rather than being cancelled. This would result in the two legs being netted off against each other, leaving a net obligation on the seller equal to the repo rate. It is apparently possible for parties to a failed overnight repo to fax the French CSD (Euroclear France) to request such netting (at a cost of EUR 230). However, this facility is reportedly not much used in practice. The ERC has asked the CSD to consider recycling failed instructions for the opening leg of an overnight repo back into the settlement process for up to 10 days, in order that it has the opportunity to be

netted against the closing leg. Such a change requires a recommendation by AFTI (Association Française des professionnels des Titres) and the Banque de France. The AFTI has declined. It takes the view that the buyer in a failed repo is adequately compensated by retaining the use of his funds and that there are too few delivery failures in overnight repos to disrupt settlement. They also object that, if the first leg was recycled and matched with the second leg, this would introduce netting as a standard feature into what was supposed to be an RTGS system.

- 6.30 Many potential delivery failures can be resolved in advance of settlement deadlines, if sufficient notice of problems is given by the CSD to the parties to unsettled transactions, and if the CSD also allows access by the parties to the settlement system to amend, correct or cancel the relevant settlement instructions. However, such functionality is not available within all CSDs in Europe. The lack can be particularly problematic in the case of cross-border transactions, which have to be settled between a national CSD and an ICSD. The need for better “interconnectivity” between all national CSDs and the ICSDs, as well as between the ICSDs, has been the subject of intense discussion in recent months as market turbulence has compounded the problems which are created by the fragmentation of settlement in Europe.¹⁸

7 Infrastructural inefficiencies contributing to settlement failures

- 7.1 The fragmentation of European settlement requires that international investors use multiple clearing and settlement systems, each with different technologies and business practices. This problem is frequently exacerbated by inconsistent fiscal, legal and regulatory frameworks. The inefficient transfer of securities imposes unnecessary costs and risks on European markets and obstructs market clearing. It also saps market liquidity by reducing trading opportunities (no same-day repo) and by making it harder to move collateral to whichever location or purpose it might best be employed.¹⁹ Costs include the reservation of securities in different CSDs in the absence of the ability to move them between CSDs efficiently, in order to ensure that collateral is available in all possible locations in which it might be required. Particular problems arise cross-border, because many international investors prefer to use the ICSDs as their settlement agents, while domestic investors use local CSDs.
- 7.2 In the context of the Single Market project, the European Commission commissioned the Giovannini Committee to examine the difficulties of cross-border settlement in Europe and suggest a way forward. In 2001, the Committee identified the 15 so-called “Giovannini Barriers”. These were categorised into: national differences in technical requirements and market practice; differences in tax procedures; and legal uncertainty. In April 2003, a second Giovannini report set out a strategy for removing these barriers within 15 years and a series

¹⁸ “Interconnectivity” is defined as the ability to transfer securities between two settlement systems on a DVP basis on the same day without a loss of value.

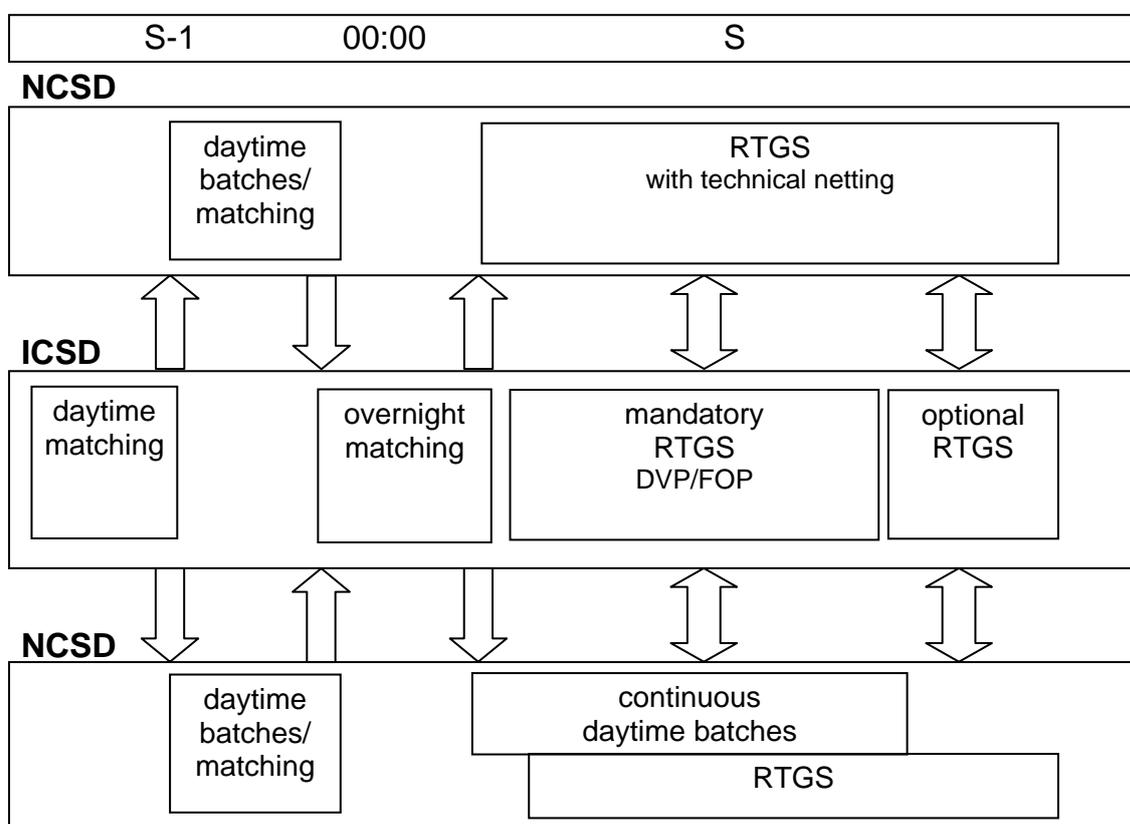
¹⁹ Collateral can be used to borrow cash through a repo or against a pledge, to borrow securities, or to collateralise exposures to OTC or exchange-traded derivatives, CCPs, payments systems or central banks.

of actions to achieve this goal, some to be taken by the private sector on its own and some which would require government intervention. The European Commission carried out its own examination of the issue, publishing communications in May 2002 and April 2004, followed by a period of consultation with market users, service providers and regulators. In November 2004, the European Council adopted the Commission's recommendations. To help push forward the work to remove the Giovannini Barriers, the CESAME (Clearing and Settlement Advisory and Monitoring Experts) group was set up to advise, monitor and co-ordinate the work to resolve private sector barriers by other groups, including ECSDA (European Central Securities Depositories Association) and the ESSF (European Securities Services Forum). Other catalysts for change have been COGESI (Contact Group on Euro Securities Infrastructures), chaired by the ECB, and CESR (Committee of European Securities Regulators). Outside Europe, similar work has been produced by the Group of Thirty (G30), IOSCO (International Organisation of Securities Commissions) and the CPSS (Committee on Payments and Settlement Systems).

- 7.3 Notwithstanding the considerable progress that has been achieved in resolving many of the problems that have plagued cross-border clearing and settlement in Europe, persistent issues include:
- Giovannini Barrier 2 (national restrictions on the location of clearing and settlement).
 - Giovannini Barrier 4 (absence of intra-day finality).
 - Giovannini Barrier 7 (differing operating hours/settlement deadlines).
 - Giovannini Barrier 10 (national restrictions on the location of the activities of primary dealers and market-makers).
- 7.4 Special challenges continue to be posed by the lack of interconnectivity between some domestic CSDs and the ICSDs, which obstructs cross-border settlement and thus cross-border investment and market integration. Interconnectivity problems have been severely aggravated by the recent financial turbulence. In 2009, two joint industry working groups were set up, involving the ICMA's ERC and various subsidiaries of AFME (ESSF and EPDA – European Primary Dealers' Association), to tackle interconnectivity issues. As a result of their work, which mapped the operations of several European CSDs and their interaction with the ICSDs, a clearer picture has emerged of the desirable features characterising an efficiently-interconnected CSD.
- 7.5 The key features of an efficiently-interconnected CSD (illustrated in the Figure 2 below) are:
- 7.5.1 On the business day before the settlement date (S-1), the results of the late (after close of business) daytime matching cycle of the ICSDs should be available to the CSD for the start of its own late daytime batch-processing or matching cycle, the results of which should, in turn, be available to the ICSDs for the start of their overnight matching

cycles.²⁰ The information provided will include details of unsettled instructions (potential delivery failures). Users should be able to input instructions into these cycles in order to validate and match them, and thereby identify potential settlement failures, well in advance of the settlement date. This gives maximum time to fix unsettled instructions. It also allows opposite transactions to be matched and netted off, in order to reduce settlement volume and improve settlement efficiency, as well as reducing the demand for liquidity and collateral in what is effectively a test phase of settlement, by not requiring the commitment of cash or securities. Alternative methods of validation and matching outside the settlement system, such as telephone pre-matching with custodian banks, are inefficient and delay input, leaving less time to fix unsettled instructions.

Figure 2: the interactions between efficiently-interconnected CSDs and an ICSD



²⁰ “Batch-processing” is a single-event clearing process. Settlement instructions are accumulated into a batch, matching instructions are identified and opposing securities transfers and cash counterpayments netted off against each other, to leave a single net cash payment. This type of process enhances the efficiency of settlement by reducing the call on cash and securities, and by identifying potential fails. In contrast, a “real-time gross settlement” or RTGS process settles each instruction separately at the time it is input into the system and requires a gross transfer of securities against a gross counterpayment of cash. RTGS requires more active management of securities and cash, but poses less risk to the system in the event a user collapses (it is easier to unwind gross instructions).

- 7.5.2 On the settlement date (S), the results of the overnight matching cycles of the ICSDs should be available to the CSD for the start of its main daytime processing cycle. This should permit validated and matched settlement instructions to be processed early on the settlement date, allowing users to focus their same-day operational activity on resolving unsettled instructions.
- 7.5.3 The main daytime processing cycles of the CSD and ICSDs should be in real-time or very frequent two-way communication, with instructions being presented for settlement between the depositories throughout the day. Feedback to users on the status of settlement instructions should be available within an hour. Timely feedback is essential for the management of unsettled instructions and in order to allow inward deliveries of securities to be re-used, thereby allowing efficient liquidity and collateral management.
- 7.5.4 The main daytime processing cycle of the CSD may be a single RTGS process (eg the RGV system in France), or dual RTGS and frequent multi-batch processes running in parallel (eg the Clearstream Banking Frankfurt system in Germany). Single RTGS processes should incorporate “technical netting”, which identifies, matches and nets off opposite instructions, or else run special netting cycles throughout the day. Both processes reduce the liquidity needed to lubricate settlement.
- 7.5.5 In dual-process systems, validated and matched settlement instructions from one process should be fed into the other without the need for re-inputting by users.
- 7.5.6 RTGS processes should allow delivery-versus-payment (DVP) or free-of-payment (FOP) settlement. FOP settlement is needed for margin payments on collateralised positions.
- 7.5.7 Unsettled instructions should be recycled into the settlement process regularly and frequently (at least once an hour). This means that, if the opening leg of a repo transaction fails to settle, it will eventually be netted off against the closing leg.
- 7.5.8 Users of a CSD should be able to input new instructions on a same-day basis, over the entire settlement day. This facility allows them to resolve settlement problems by inputting corrections, amendments and cancellations to unsettled instructions.
- 7.5.9 All users should be able to input instructions over the whole daytime settlement cycle, which should run for the full business day. A long settlement cycle allows activity to be spread more evenly, making settlement easier to manage, avoiding concentrations of problems, easing the demand on liquidity and securities, and giving users more time to resolve unsettled instructions. There is no case for preferential access by a group of domestic users.

7.5.10 At the end of daytime processing cycle, it helps to have an “optional” settlement process which allows instructions for the next settlement day to be input, with the option not to proceed to settlement. This provides another opportunity to validate and match settlement instructions in order to identify potential delivery failures.

7.5.11 Settlement efficiency can be enhanced by the provision of self-collateralisation mechanisms, which automatically post collateral from a user’s securities account to allow credit to be extended to the users where it is necessary to achieve settlement.

7.5.12 Legal finality of settlement (the irrevocable transfer of legal and beneficial title to securities) should be immediate in order to remove uncertainty and allow early re-use of securities.

8 Major barriers to interconnectivity in Europe

8.1 Set against the list of ideal characteristics for an efficiently interconnected CSD, it is clear that the most significant barriers to interconnectivity between CSDs and ICSDs exist in Greece, Italy and Spain. There are also issues in Italy and Spain about the role of the local CCP, and in Greece about the lack of a CCP. Constructive dialogue between the CSDs and market users has succeeded in resolving a number of issues, but serious concerns and uncertainties remain unresolved in the opinion of many market users.

Greece

8.2 The recent financial crisis in Greece accentuated problems posed by technical and procedural barriers to interconnectivity. The repo market seized up because of the collapse in the credit of Greek counterparties and the Greek government, which increased concern about “wrong way risk” in the repo market for Greek government securities (the positive correlation between the credit risks of repo counterparties and the issuer of collateral securities). The lack of (unused) credit lines to Greek banks and the fear of wrong-way risk have effectively isolated them as borrowing counterparties. The collateral famine may have been made worse by the diversion of Greek securities into the ECB as collateral to access central bank liquidity.

8.3 While settlement efficiency has largely been maintained, concern has in the past been expressed that the volume of delivery failures may be understated because local custodian banks reportedly would not enter instructions into the CSD (Bank of Greece) for cash or repo transactions executed outside the electronic trading systems (so-called OTC trades), if they were not certain of delivery. In July 2009, the CSD opened direct links to international electronic trading systems such as BrokerTec, by-passing local custodian banks, so this problem is now limited to non-electronic (so-called “OTC”) transactions.

8.4 Until February 2009, sellers who failed to deliver in either the cash or repo markets in Greek government securities were forced into a centralised repo auction at the end of the day on the domestic electronic trading system HDAT.

The forced auction can be characterised as an automatic securities lending facility, which is generally a very helpful function. Unfortunately, such facilities need to provide certainty to users about the cost of borrowing. The key objection to the forced auction in Greek government securities was that dealers, including those who went short in the process of market-making, faced potentially unlimited borrowing costs. This problem may explain why the auctions were generally unsuccessful and were suspended.

8.5 In November 2009, a facility was introduced by the CSD which recycled failed instructions to the next settlement date for up to 10 days. This initiative came under political attack on the pretext that it was facilitating short-selling of Greek government securities. In the event, recycling was not effective due to the scarcity of securities. In April 2010, the forced auction re-activated, but only for delivery failures on HDAT, which has subsequently suffered a sharp loss of business. Following the outbreak of the financial crisis in Greece, foreign dealers have an added objection to the possibility of having to use the forced auction in that they would not wish to be matched with Greek counterparties, for whom they no longer have credit lines or capacity. These problems have made primary dealers unwilling to quote for fear of going short, thereby severely damaging repo and cash market liquidity.

8.6 The first issue to be resolved in the Greek market is how to release the pool of securities trapped in local custodian banks or rendered inaccessible because of credit objections to Greek counterparties. Suggestions include:

8.6.1 A standing repo facility for primary dealers at the Greek debt management office (PDMA) or Bank of Greece along the lines of the facilities offered by the debt management agencies in Belgium, Netherlands, Portugal and the UK, lending temporary issues of securities which are scarce in the market (phantom/synthetic bonds). However, this suggestion could attract opposition, as it could be construed (incorrectly) as feeding speculative short-selling.

8.6.2 An alternative to a standing repo facility, that might be able to avoid accusations of supporting short-selling, would be a bond exchange operated by the PDMA in which phantom/synthetic Greek government securities would be created and exchanged for existing issues held by primary dealers. In order to ensure that no undesirable speculative activity was encouraged, primary dealers would be required to report long and short positions daily. Bond exchanges would also be helpful in restructuring the government yield curve, alleviating pressure on scarce maturities and facilitating secondary market liquidity. Italy and Portugal offer such a facility. This suggestion would of course raise issues of debt management strategy and necessarily require consultation with the cash market.

8.6.3 Interposing a CCP in a reformed daily repo auction to clear unsettled short positions. However, as Greek banks could not gain access to an existing CCP because of credit issues, it has been suggested that the PDMA act as a credit intermediary. Market users appear to be willing

to accept Greek sovereign risk in order to resolve settlement problems. It is generally accepted that the implicit borrowing fee needs to be high, in order to attract securities lenders (repo sellers). However, the fee must be capped and not disproportionate (in contrast to the forced auction). Initial suggestions have been for a fee of 5-10%.

- 8.6.4 An official CCP using collateral swaps. If there are likely to be political objections to the concept of an official CCP intermediating repos because of a mistaken association with short-selling, an alternative would be collateral swaps constructed with back-to-back repos, as this mechanism would require both sides of a swap to be long of Greek securities. However, there could be practical difficulties with this idea, if dealers were unable to deliver to the CCP from their long positions because counterparties from whom they have purchased securities have failed to deliver, or counterparties to whom they have repoed out their securities fail to return the securities at the maturity of the repos.
- 8.6.5 The ECB should be encouraged to recycle the Greek government securities that it is holding back into the market. However, the ECB only has the power to recycle the securities that it has purchased since May 2010.
- 8.7 In addition to the exceptional problems caused by the financial crisis in Greece, there are underlying issues with the technical operation and business practices of the CSD.
- 8.7.1 There are no overnight batch-processing cycles, only the daytime RTGS process (although the CSD apparently has the ability to activate netting at any time). This precludes the opportunity to validate and match settlement instructions, and identify and fix potential delivery failures, before or early on the settlement date, as well as the opportunity to match and net off opposite transactions in order to reduce settlement volume and improve settlement efficiency. Market practice has been for custodian banks to pre-match OTC instructions by telephone or exchange of files (see below), but settlement instructions tend to be released by the custodian banks to the CSD only on the settlement date.
- 8.7.2 The most fundamental problem is the shortness of the settlement cycle of the Greek CSD. The CSD is open from 07:30 to 14:30 CET (local time is CET+1), but the effective window is much shorter.
- There is little liquidity in the system in the first two hours, apparently due to the reluctance of custodian banks to pay cash into the RTGS process early in the day, so most settlement takes place after 09:30 CET.
 - For electronically-negotiated transactions, the settlement window closes earlier because of the deadline imposed by the Hellenic Banking Association (HBA), which represents all custodian banks, in order to meet the CSD deadline of 14:30 CET, of noon CET

(compared to 14:30 CET for OTC transactions). HBA has refused requests to extend the electronic deadline to 13:30 CET because of unspecified operational reasons. This leaves little time to input settlement instructions and even less time to resolve potential delivery failures, ties up securities and precludes their re-use for cross-border transactions. In addition, electronic transactions tend to settle at the opening of the settlement cycle.

- 8.7.3 In contrast, the bulk of OTC instructions --- accounting for about 15% of total settlement --- take place at the end of the settlement cycle. This may reflect liquidity problems at Greek banks, which cause them to delay settlement as long as possible. It may also arise because of the requirement imposed by local custodian banks for the pre-matching of settlement instructions by telephone before the custodians will input the instructions into the CSD. Telephone pre-matching is not an official requirement but appears to have been adopted in order to avoid delivery failures and thus the forced auction. After the CSD discontinued the forced auction, it opened discussion with local agent banks to encourage them to abandon telephone pre-matching and offered to consider alternatives such as a “hold-and-release” mechanism. Telephone pre-matching of OTC instructions does not appear to have been given up. Local custodian banks agreed that, from September 2009, they would send the majority of settlement instructions to the CSD early in the morning and to provide users with more details on the status of unsettled transactions on a real time basis. The CSD agreed to start settlement at 20:00 CET on S-1. It is unclear to many users whether these changes have been implemented.
- 8.7.4 The CSD has also agreed to consider an extension to the settlement day, but has been waiting to see if earlier settlement instructions (see above) would help.
- 8.7.5 The ICSDs have opened or are investigating the possibility of opening accounts directly at the CSD.
- 8.7.6 There is no shaping of settlement instructions. This practice could reduce the accumulation of delivery failures for primary dealers. It would also reduce the liquidity requirements of settlement by allowing a smoother flow of smaller deliveries to be fed through the settlement system

Italy

- 8.8 The principal issue with the Italian CSD (Monte Titoli) is the dramatic increase in delivery failures on transactions (mainly repo) cleared through the international CCP, LCH.Clearnet SA, during 2009-10. In May 2010, this reached almost 11% (in terms of value and including delivery failures rolled over from previous days). In contrast, the rate of delivery failures on transactions (mainly cash) cleared through the domestic CCP, CC&G, has hardly changed, despite an apparent 40% rise in settlement volume.

- 8.9 The CSD has reported that settlement efficiency in government securities has fallen from over 99.1% to 97.6% in February 2010 (in terms of value and excluding accumulated delivery failures). As the settlement system has not been changed, the CSD believes the increase in delivery failures was due to a shift in trading behaviour which has been reflected in an increase in uncovered short positions. These almost doubled over the year to May 2010, to reach EUR 200 billion, and buy-in notices in the first two months of 2010 equalled those sent over the whole of 2009. The CSD sees recent settlement problems as exceptional and related to the market conditions which were triggered by the loss of confidence in and consequent sell-off of Italian government securities. In support of this hypothesis, it has been argued that:
- settlement problems have been concentrated in specific issues, often trading at negative rates in the repo market, implying increased short-selling;
 - the contrast between the delivery failure rates in LCH.Clearnet and CC&G reflects a polarisation of clearing and settlement between international institutions, who tend to use LCH.Clearnet for clearing and ICSDs for settlement, and domestic institutions, who tend to use CC&G for clearing and the CSD for settlement; and that domestic institutions are less active traders and therefore less likely to suffer from delivery failures.
- 8.10 LCH.Clearnet has noted that the sharp increase in delivery failures took place around the same time as the start of same-day transactions in CCP-guaranteed repos in November 2009. The same-day repo settlement facility might have increased delivery failures because of the lack of daytime batch-processing (see below), which would otherwise resolve many delivery failures. There is also no shaping of deliveries on the opening leg of same-day repos and the instructions for these transactions have to go straight into the RTGS process from where they are not recycled into the batch-processing cycles. On the other hand, a rise in delivery failures can be detected before same-day repo was introduced.
- 8.11 Some market users suspect that market turbulence revealed flaws in the infrastructure and argue that:
- many of the issues suffering settlement problems are off-the-run and there is no coherent economic rationale for short-selling them;
 - international investors do not in fact use the ICSDs to settle Italian securities, but employ local custodian banks, which means that the higher failure rate at LCH.Clearnet is unlikely to be attributable to a different client base.
- 8.12 It may well be that increased delivery failures do reflect differences in the trading behaviour of domestic and international investors that were accentuated by market difficulties, but that these have become problematic only because of barriers to interconnectivity, which will exclusively affect international investors. While international investors use the CSD rather than the ICSDs for the settlement of Italian securities, it appears that they tend to use LCH.Clearnet rather than CC&G for clearing (although CC&G reportedly does have international members active in repo). So, it is not unreasonable to suggest that the different trading behaviour of domestic and international investors is a factor in the increased delivery failures at LCH.Clearnet. However, the question is

why international investors have experienced increased delivery failures. This would suggest difficulties in borrowing from domestic investors, who are naturally long of Italian securities --- ie an illiquid securities lending market --- and obstacles to identifying and fixing unsettled instructions at the CSD --- ie barriers to interconnectivity.

8.13 The following interconnectivity issues have been identified with the operation of the CSD:

8.13.1 The major problem at the CSD is that the RTGS and daytime batch processes in its dual settlement system are largely independent. Unsettled instructions are passed from the overnight batch-processing cycle via the daytime batch-processing cycle into the RTGS, where they remain. They are not recycled back into the next overnight batch-processing cycle, nor does the RTGS process offer technical netting. In the case of overnight repo, the opening leg is settled in the RTGS, while the closing leg is settled in the overnight batch-processing. This means that delivery failures on the opening leg of repo transactions cannot be matched and netted off against the closing leg. It has been reported that the closing leg of some repos have settled while the opening legs have remained unsettled. Delivery failures simply accumulate and, as they are not margined, credit risk increases. The CSD objects to matching on the grounds that it effectively converts a failed repo into a contract for differences with no exchange of securities.

8.13.2 Intervention in the RTGS process by users, to correct, amend or cancel unsettled instructions in order to fix delivery failures is impossible in practice. To cancel a settlement instruction, it is necessary to agree a new transaction with the counterparty and enter this into RTGS. A new transaction requires the user to commit additional funding, which makes the process costly.

8.13.3 Unsettled instructions are recycled within RTGS for up to 10 days. While in theory this is good practice, as it should allow failed instructions for the opening leg of a repo to be matched and netted off against the closing leg, the fact that unsettled instructions are not recycled via the daytime batch-processing, and the difficulties faced by users in trying to fix instructions, mean that the procedure serves no useful purpose. Indeed, it has perverse consequences in that it delays a possible buy-in by up to a further 10 days. If a user tries to avoid a buy-in by borrowing in the market at the end of this period, he will tend to face very high borrowing fees.

8.13.4 The concentration of settlement in the overnight batch-processing cycle (98% by number of instructions, 80% by value) is seen as a sign of settlement efficiency by the CSD and attributed to the attractive advanced functionality of this cycle (multilateral netting and the automatic collateralisation of credit requirements). However, some

users suggest it may also be a reflection of the difficulties posed by the RTGS process.

- 8.13.5 Local custodian banks require very early telephone pre-matching of settlement instructions: by 17:30 CET on S-1 for non-electronic (OTC) transactions in the overnight batch-processing cycle and all day for the RTGS process.²¹ This delays the inputting of instructions. It has been claimed that there are tools in the CSD that allow users to perform early matching of transactions by using segregated accounts (Conte Liquidatori) for each customer, but it is unclear whether this is a practical approach. The CSD has been consulting on the possible introduction of new matching facilities (including a hold-and-release facility and bilateral cancellation), which would remove the prima facie need for telephone matching, and is confident it can deliver these improvements quickly. However, there is some concern among users that, as telephone pre-matching in Greece did not cease when the apparent cause (the forced auction) was discontinued, it might not cease in Italy when matching facilities are introduced. Such practices tend to become entrenched in the procedures of local custodian banks.
- 8.13.6 The finality of the daytime batch-processing cycle is late in the day, 13:15 CET, by which time, it might be too late for interconnection with the ICSDs in order to re-use securities.
- 8.13.7 The CSD has consulted on the insertion of multiple daytime batch-processes, and the recycling of instructions into the RTGS process when certain volume and value thresholds are crossed. However, it felt that such changes would not be cost-effective, given that only 1-2% of transactions settle in the daytime batch-processing
- 8.13.9 The CSD is unique among CSDs in having different shape sizes for CCP and OTC transactions. It has harmonised shaping at EUR 5 million for all CCP and OTC transactions, except same-day CCP transactions (which remain at EUR 25 million). It estimates that harmonised shaping will reduce delivery failures by 30%.
- 8.13.10 Access to the RTGS between 16:10 and 18:00 CET is reserved for local custodian banks. This shortens the settlement day for the rest of the market.
- 8.14 There is concern that netting calculations are performed by the CSD, which passes the results to the CCPs, in contrast to other clearing and settlement arrangements under which CCPs perform the netting function and then pass the results to the CSDs for settlement. Concern has been expressed about the blurring of functions between the CSD and CCPs.

²¹ While pre-matching applies only to OTC transactions, the delay caused in the settlement of these transactions can impact on the settlement of CCP transactions where there is a chain of transactions across the two markets.

Spain

- 8.15 The following interconnectivity issues have been identified with the operation of the CSD (Iberclear):
- 8.15.1 There is a concentration of settlement activity between 13:00 and 13:30 CET (about 30%), which constrains the ability of users to tackle unsettled transactions or to re-use securities for same-day value. While daytime settlement is available from 07:00, the concentration of settlement in the early afternoon is attributed in part to the practice of certain investment fund participants who are currently unable to instruct transactions earlier on the settlement day due to timing issues relating to their cash positions. The CSD believes it is also due to the same-day trading of government securities during this period, which it sees as a desirable market activity. It also maintains that the remaining 2-2½ hours of the settlement day and a last batch-processing at 16:45 is adequate to settle other transactions. The CSD and the ICSDs have agreed to examine the issue together.
 - 8.15.2 The finality of the overnight batch-processing cycle, which ends at 20:00 on S-1, was delayed until 07:00 on the settlement date. This was seen as very late and representing a constraint on the re-use of securities. The CSD announced in October 2009 that finality was to be advanced to 00:00 CET on the settlement date.
 - 8.15.3 Between 15:30 and 16:00 CET, access to the settlement process was restricted to users with their own accounts at the CSD settling their own transactions and excluded third-party users. The CSD stressed that the constraint was limited to communication only, as pending third-party trades could settle during this period, as well as in the last batch around 16:45 CET. It also questioned the significance of the issue, suggested that the problem was due to ICSD processes and initially claimed that the required technical changes to open access to all users were too expensive to contemplate and unjustified given the imminence of T2S. The ICSDs argued that the issue was significant, claiming that 15% of transactions remained unsettled at 14:30 and 10% at 16:45. In October 2009, the CSD decided that the settlement system was flexible enough to permit reasonable exceptions upon request. It has also declared itself willing to consider alternatives, including further narrowing of the exclusion period, but has ruled out elimination because of system requirements. The CSD and the ICSDs agreed to discuss the issue. In November 2009, the CSD extended the deadline for third-party instructions to 16:00 and own-account members to 16:15.
 - 8.15.4 Members of the CSD are prohibited from failing to deliver. This makes them reluctant to trade with non-members (who can fail), given that the members would be obliged to borrow in order to cover delivery failures by non-members, which could prove expensive. The

fail prohibition on members has the effect of isolating the domestic market in Spanish government securities.

- 8.15.5 The prohibition on members of the CSD failing necessitates the own-account window and a special fails management window at the end of the first settlement cycle, which might be better used to extend the first cycle.
 - 8.15.6 The only foreign institutions able to open third-party or omnibus accounts at the CSD are foreign CSDs. Non-CSD foreign participants can only open own accounts. This compels foreign users to use domestic settlement agents. The CSD claims that opening access to other market users would require a change in national law and it was agreed to revive this issue when proposals for EU securities law reform are made.
 - 8.15.7 The prohibition on members of the CSD failing ensures that delivery failures are kept at low levels, but only through restrictive practices such as obstructing foreign membership of the CSD and providing preferential access to the settlement process to members, in other words, through barriers to interconnectivity. The rate of settlement efficiency that is being achieved may therefore be a fragile metric.
- 8.16 Currently, the only CCP clearing Spanish government securities is MEFFClear, which is operated by the local futures exchange MEFF (Mercado Español de Futuros Financieros). There is a fundamental weakness in the role performed by MEFFClear in that it would apparently withdraw from clearing in the event of a default by a member, leaving other members to cover the loss. In other words, the CCP would cease to be a CCP in the event of a default. For this reason, the CCP is largely, if not entirely, ignored by international financial intermediaries. It is not possible for other CCPs, such as LCH.Clearnet or Eurex Clearing, to clear Spanish government securities because they are not allowed access to the local CSD.

9 Conclusions

- 9.1 The importance of the repo market to the efficiency and stability of the financial system is such that regulatory initiatives need to be carefully considered in order to avoid unintended damage, particularly given the greater reliance that will be placed on the repo market by regulators and governments in coming years.
- 9.2 Proposals for regulatory restrictions on short-selling appear to be based on misunderstanding of the activity, and concerns that short-selling causes market disruption or dislocation cannot be supported by the available evidence. Regulatory restrictions are undesirable, as they would entail serious costs to market users, including issuers and investors, and are unnecessary in view of the probably insignificant scale of abusive short-selling. Regulatory limits on short positions presuppose that short-selling is inherently undesirable, which it is not. It would also be difficult to set limits that do not damage market liquidity, and such limits may not in practice be effective in achieving their objective of

protecting certain assets from price falls. Abusive short-selling, like any form of market abuse, should be treated by applying existing market abuse regulations. It could be helpful if market transparency was enhanced by the confidential reporting of short positions to regulators.

- 9.3 Trying to prohibit abusive uncovered short-selling by imposing a pre-borrowing requirement (that borrowing should always precede short-selling) mistakenly assumes that the relative timing of short-selling and short-covering is a reliable indicator of intent. A “pre-borrowing” regulation is not needed to address temporary uncovered short positions, as they are not a problem, nor is it a sensible way of addressing unintentional uncovered short positions, as it does not address the causes.
- 9.4 While intentional uncovered short-selling, by definition, results in delivery failure, the problem of delivery failures in Europe is not a reflection of short-selling. It is more to do with inadequate borrowing supply and obstacles to interconnectivity between CSDs in the fragmented European settlement landscape, particularly between the national CSDs used by domestic investors and the ICSDs used by cross-border investors. However, the scale of the problem is being continuously reduced by the market itself, through the adoption of electronic trading, CCPs, tri-party repo and post-trade pre-settlement matching systems, as well as by the automatic securities lending facilities offered by the ICSDs. Most importantly, however, generally-accepted market conventions create economic incentives that, in normal circumstances, are very effective in deterring intentional uncovered short-selling and encouraging the covering of unintentional short positions. These conventions need to be promoted across all markets in Europe.
- 9.5 The automatic agency securities lending facilities offered by the ICSDs are particularly helpful in allowing international investors to avoid delivery failures. The special repo facilities offered by some debt management agencies perform a similar function but only for primary dealers and sometimes only in exceptional circumstances. Automatic securities lending facilities similar to those at the ICSDs would be a welcome innovation by other CSDs. However, it is essential that the cost of borrowing through such facilities is capped and that the principal lenders are acceptable credits. The failure to meet these conditions led to the difficulties experienced with the forced auction in Greece.
- 9.6 While the normal economic incentives against uncovered short positions created by market conventions are weakened when interest rates fall to very low levels, the market has a wide range of additional measures in place that could be employed to deal with delivery failures in such exceptional circumstances. New initiatives have also been discussed, including penalties for delivery failures, and there are many other improvements being rolled out or discussed.
- 9.7 The most productive official initiatives to reduce delivery failures would be firm support for improvements in the systems and business practices at some CSDs to enhance their interconnectivity to the ICSDs, in order to facilitate the identification and correction of errors in advance of settlement deadlines, and more efficient transfers of securities cross-border. The principal barriers to

interconnectivity are: the shortness of the settlement day; late, infrequent or unsynchronised feedback between CSDs and ICSDs; the lack of matching within some RTGS; unsettled instructions not being recycled automatically back into the next settlement cycle; obstacles to access by users to correct errors; discrimination against cross-border users in terms of access to CSDs; the lateness of settlement finality; the lack or uncertain cost of securities lending facilities; and obstacles to competition (“interoperability”) between CCPs.

- 9.8 High settlement rates in some CSDs appear to be the result of the adoption of second-best alternatives (eg pre-matching outside the settlement system and use of batch-processing rather than RTGS) and restrictive practices (eg foreign membership and exclusive lending facilities) that obstruct cross-border interconnectivity and financial market integration.

ANNEX: the nature of a repo transaction

A repo, also known as a 'sale-and-repurchase agreement', is a financial instrument in which the seller sells securities to the buyer against cash and simultaneously agrees to repurchase the same or similar securities in the future.²² The repurchase date is typically fixed at the start of the transaction, except in the case of 'open' repos, which can be rolled over until one of the counterparties terminates the transaction.

The repurchase price of the repo is equal to the original purchase price plus an amount of interest (or an equivalent return) on the cash paid by the buyer at the start. The rate of interest or equivalent return is called the 'repo rate'.

The securities held by the buyer during the term of the repo act as 'collateral' against the risk of the seller defaulting on the repurchase. To this extent, a repo is analogous to a secured deposit. However, as the collateral has been sold to the buyer, he has legal and beneficial title to it during the term of the repo, which means that he has a right of 're-use' --- he can sell the collateral to a third party at any time during the term of the repo, through either another repo or outright, without anyone else's permission (the collateral is his property). The right of the buyer to sell the collateral at any time during the term of the repo (including the period before a formal insolvency) provides greater confidence in the effectiveness of that collateral than traditional forms of collateralisation such as pledging (in which legal ownership remains with the original owner until awarded by an insolvency court to the cash lender, which is not necessarily certain). The reduced risk to the buyer should mean that the repo rate is lower than unsecured deposit rates, so repo should provide cheaper funding than other money markets.

If the buyer on-sells repo collateral outright to a third party, he will create a short position in that collateral. The buyer will eventually have to buy back that collateral from the market in order to conclude the repo. If the price of the collateral rises before he buys it back, he will suffer a loss on his short position (and vice versa). In economic terms, he has used the repo to 'borrow' the collateral, notwithstanding that, in legal terms, he has purchased the collateral. Repo can therefore perform an analogous function to a securities lending agreement.

Because the seller agrees to repurchase the collateral at the end of the repo at an agreed repurchase price, the impact of market or credit-driven changes in the current market price of the collateral during the term of the repo will affect the seller, not the buyer. For example, if collateral is sold in a repo at a purchase price of 110 and the repurchase price is set at 111 --- equal to the purchase price of 110 and repo interest of 1 --- a fall in the current market price of the collateral to 109 during the term of the repo will mean the seller has to pay an implicit price of 110 for the collateral (plus 1 in interest) for collateral that is now actually worth only 109, so the seller suffers the consequences of the price fall. Because the seller retains the risk on the collateral, he should also receive any returns. Thus, if a coupon is paid on a security being used as collateral during the term of a repo, the issuer of the security will actually pay it to the buyer, as he is the legal owner, but the buyer will make an equivalent payment to the seller (sometimes

²² It is possible to repo other types of assets, but the vast bulk of collateral is composed of securities (mainly fixed income, but some equity).

called a 'manufactured payment'). The rationale for the repo seller retaining the risk and return on the collateral is that a repo is designed to allow a party buying and taking a long position in a security to finance the purchase of that security using the security itself as collateral. The party concerned has taken a long position in the security precisely in order to gain exposure to the risk and return on that security. He only wants the repo to provide financing.

Repo is a generic term that includes 'repurchase agreements' and 'sell/buy-backs'. These are economically identical instruments. However, there are legal and operational differences. Repurchase agreements combine the purchase and repurchase legs of a repo into a single contract, which is documented and margined (ie material divergences between the value of the cash and the collateral during the term of the repo are eliminated by means of marginal cash or collateral transfers). On the other hand, in sell/buy-backs, the purchase and repurchase legs were traditionally separate contracts, and the overall transaction was neither documented nor margined. This made sell/buy-backs riskier than repurchase agreements (but cheaper to transact). Since 1995, it has been possible to document sell/buy-backs (the ICMA's Global Master Repurchase Agreement has a Buy/Sell-Back Annex for this purpose). Documented sell/buy-backs are single contracts like repurchase agreements. The remaining differences are essentially operational: sell/buy-backs do not use margining but an equivalent process; and manufactured payments are deferred until the end of the sell/buy-back rather than being paid on the same day as the coupon, as is the case in a repurchase agreement. The different operational techniques used in sell/buy-backs avoid the legal and operational obstacles that exist in some countries to aspects of the way that repurchase agreements work.

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The author served for ten years at the Bank of England, within its Foreign Exchange Division and on secondment to the International Monetary Fund in Washington DC.

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EXECUTIVE SUMMARY

In December 2009, the European Repo Council (ERC) of the International Capital Market Association (ICMA) conducted the 18th in its series of semi-annual surveys of the repo market in Europe.

The latest survey asked a sample of financial institutions in Europe for the value of their repo contracts that were still outstanding at close of business on December 9, 2009. Replies were received from 58 offices of 53 financial groups, mainly banks. Returns were also made directly by the principal tri-party repo agents and automatic repo trading systems (ATS) in Europe, and by the London-based Wholesale Market Brokers' Association (WMBA).

Total repo business

The total value of repo contracts outstanding on the books of the 58 institutions who participated in the latest survey was EUR 5,582 billion, compared to EUR 4,868 billion in June 2009 and the peak of EUR 6,775 billion reached in June 2007.

Although the headline number grew by 14.7%, a comparison of the aggregate returns from a constant sample of institutions showed growth over the last six months to be 20.2%. However, the aggregate recovery in the repo market continues to blend very different rates of growth by individual institutions. The high rate of growth over the last six months

was powered by a handful of institutions, while there appears to be continued structural deleveraging among others.

Counterparty analysis

Electronic repo trading fell back to 27.5% from its high of 28.5% in June 2009, as the growth in this sector failed to keep pace with the growth in the overall market, which saw a significant increase in forward-start repo, which is a very small percentage of electronic business.

Reported voice-brokered repo, which is concentrated in London, suffered from the reduction in sterling business.

Geographical analysis

The share of anonymous trading across ATS's jumped to a record 18.3% from 14.5% in December 2008, which would seem to reflect the continued attraction of central clearing counterparties (CCP) as a means of managing credit risk and perhaps also the new CCP facility in Italy.

Settlement analysis

The share of triparty business dropped sharply to 8.0% from 11.1%, as bilaterally settled repos grew faster.

Cash currency analysis

The most noticeable change was the sharp fall in the share of

sterling to 12.3% from 15.3%, reflecting fiscal and political concerns about the UK.

Collateral analysis

In line with developments in sterling, there was also a dramatic reduction in the use of UK collateral to 12.4% from 16.1%. This triggered a sharp fall in the share of EU government bonds (as a percentage of all EU fixed income collateral) to 76.1% from 83.6%.

Contract analysis

The share of undocumented buy/sell-backs fell back further to a new record low of 2.9%.

Repo rate analysis

The share of floating-rate repos continued to contract.

Maturity analysis

Traditional seasonal patterns were weak. The most significant change was the jump in forward-start repo to 11.3% from 6.1%, probably in anticipation of official interest rate changes.

Product analysis

Securities lending conducted on repo desks retreated to 15.4%, after the sharp recovery seen in June 2009.

Concentration analysis

December 2009 saw a further increase in the concentration of surveyed repo business, reflecting the role of a handful of well-placed institutions in expanding activity, as others continue to deleverage.

CHAPTER 1: THE SURVEY

On December 9, 2009, the European Repo Council (ERC) of the International Capital Market Association (ICMA) conducted the eighteenth in its series of semi-annual surveys of the repo market in Europe.

The ICMA survey was actively supported by the ACI - The Financial Markets Association, and has been welcomed by the European Central Bank and European Commission. The survey was managed and the results analysed on behalf of ICMA by the ICMA Centre at Reading University in England under the guidance of the ERC Steering Committee ("ERC Committee").

1.1 What the survey asked

The survey asked financial institutions operating in a number of European centres for the value of the cash side of repo and reverse repo contracts still outstanding at close of business on Wednesday, December 9, 2009.

The questionnaire also asked these institutions to analyse their business in terms of the currency, the type of counterparty, contract and repo rate, the remaining term to maturity, method of settlement and source of collateral. In addition, institutions were asked about securities lending and borrowing conducted on their repo desks.

The detailed results of the survey are set out in Appendix C. An extract of the accompanying Guidance Notes is reproduced in Appendix A

Separate returns were made directly by the principal automatic repo trading systems (ATS) and tri-party repo agents in Europe, and an aggregate return was made directly by the London-based Wholesale Market Brokers' Association (WMBA).

1.2 The response to the survey

The latest survey was completed by 58 offices of 53 financial groups. This is three fewer institutions than participated in June 2009. While five institutions which participated in the last survey dropped out of the latest survey, two because of mergers, two institutions rejoined.

The institutions surveyed were based in 14 European countries, as well as in North America and Japan. 45 institutions were based in 13 of the 27 member states of the EU (no institutions from Finland, Portugal and Sweden, and only one former Accession State, participated in the latest survey), and 39 were based in 11 of the 15 countries of the eurozone. However, although some institutions were based in one country, much of their business was conducted in others. Many institutions provided data for their entire European repo business.

Others provided separate returns for each office with its own repo book. A list of the institutions that have participated in ICMA repo surveys is contained in Appendix B.

1.3 The next survey

The next survey is scheduled to take place at close of business on Wednesday, June 9, 2010.

Any financial institution wishing to participate in the next survey can download copies of the questionnaire and accompanying Guidance Notes from ICMA's web site. The latest forms will be published shortly at the following website:

www.icmagroup.org/surveys/repo/participate.

Questions about the survey should be sent by e-mail to reposurvey@icmagroup.org.

Institutions who participate in the survey receive, in confidence, a list of their rankings in the various categories of the survey.

CHAPTER 2: ANALYSIS OF SURVEY RESULTS

The aggregate results for the latest two surveys, and the December surveys in the previous three years (2006-2008), are set out in Appendix C. Full details for all previous surveys can be found at www.icmagroup.org.

Total repo business (Q1)

The total value at close of business on December 9, 2009, of repos and reverse repos outstanding on the books of the 58 institutions which participated in the latest survey increased to **EUR 5,582** billion. Of the sample of 58 institutions, 29 were net lenders, up from 24 in the last survey. However, aggregate net lending was exactly equal to aggregate net borrowing.

Table 2.1 – Total repo business from 2001 to 2009

survey	total (EUR bn)	repo	reverse repo
2009 December	5,582	50.0%	50.0%
2009 June	4,868	52.2%	47.8%
2008 December	4,633	49.9%	50.1%
2008 June	6,504	48.8%	51.2%
2007 December	6,382	49.4%	50.6%
2007 June	6,775	50.8%	49.2%
2006 December	6,430	50.7%	49.3%
2006 June	6,019	51.7%	48.3%
2005 December	5,883	54.6%	45.4%
2005 June	5,319	52.4%	47.6%
2004 December	5,000	50.1%	49.9%
2004 June	4,561	50.6%	49.4%
2003 December	3,788	51.3%	48.7%
2003 June	4,050	50.0%	50.0%
2002 December	3,377	51.0%	49.0%
2002 June	3,305	50.0%	50.0%
2001 December	2,298	50.4%	49.6%
2001 June	1,863	49.6%	50.4%

It is important to remember that the survey measures the value of outstanding transactions at close of business on the survey date. Measuring the stock of transactions at one date, rather than the flow between two dates, permits deeper analysis but is difficult to reconcile with the flow numbers published by other sources.

As the survey is a 'snapshot' of the market, it can miss peaks and troughs in business between survey dates, especially of short-term transactions. In addition, the values measured by the survey are gross figures, which mean that they have not been adjusted for the double counting of transactions between pairs of survey participants. Nor

does the survey measure the value of repos transacted with central banks, as part of official monetary policy operations. This has been considerable during recent market difficulties.

In order to gauge the year-on-year growth of the European repo market (or at least of that segment represented by the institutions which have participated in the survey), it is not valid to simply compare the total value of repos and reverse repos with the same figures in previous surveys. Some of the changes represent the entry and exit of institutions into and out of the survey, mergers between banks, and the reorganization of repo books within banks. To overcome the problem caused by changes in the sample of survey participants, comparisons are made of the aggregate outstanding contracts reported only by a

sub-sample of institutions which have participated in several surveys. However, the size and direction of the change can be very dependent on the choice of sample.

The repo business of the 51 institutions that participated in all of the last three surveys grew by 20.2% over the six months from the June 2009 survey and 18.0% year-on-year. Of the 58 institutions in the latest survey, the repo books of 27 expanded, compared to 29 out of 61 in the last survey. However, the aggregate recovery in the repo market continues to blend very different rates of growth by individual institutions. The high rate of growth over the last six months was powered by a handful of institutions, while there appears to be continued structural deleveraging among others.

Counterparty analysis (Q1.1)

Table 2.2 – Counterparty analysis

	December 2009		June 2009		December 2008	
	users	share	users	share	users	share
direct	58	54%	61	52.1%	61	51.6%
of which tri-party	32	8%	31	11.1%	31	9.4%
voice-brokers	50	18.5%	50	19.3%	48	20.2%
ATS	44	27.5%	46	28.5%	48	28.2%

Electronic repo trading fell back to 27.5% from its high of 28.5% in June 2009. The data provided directly by the principal automatic trading systems (ATS) operating in Europe – BrokerTec, Eurex Repo and MTS – showed that the outstanding value of electronically-traded repos rose

sharply to EUR 851 billion from EUR 752 billion in June 2009. However, this was still well below the peak of EUR 961.1 billion recorded in June 2007. Moreover, growth was not as fast as the overall market, to some extent reflecting the fact that electronic trading tends to be dominated by commoditised

transactions and has failed to benefit from the recent expansion in forward-start repo, which is a very small percentage of electronic business (see below).

The share of triparty business dropped sharply to 8.0% from 11.1%. The principal triparty agents in Europe – Bank of New York, Citibank, Clearstream, Euroclear, JP Morgan and SIS – provided data directly. Their aggregate business

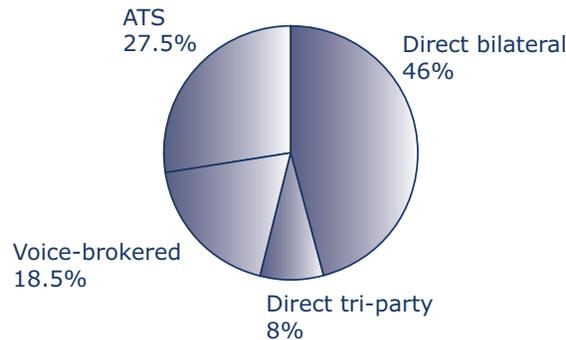
was virtually stagnant, compared with the 20.2% growth in the overall market.

Voice-brokered business continued to contract, falling to 18.5% from 19.3%. While voice-brokers would have benefited from the increase in forward-start repo, they have probably suffered from the reduction in sterling business, given their concentration in London (see below).

Table 2.3 – Numbers of participants reporting particular types of business

	Dec-09	Jun-09	Dec-08	Jun-08	Dec-07	Jun-07
ATS	44	46	48	47	48	56
anonymous ATS	37	33	38	33	35	39
voice-brokers	50	50	48	46	51	54
tri-party repos	32	31	31	30	36	45
total	58	61	61	61	68	77

Figure 2.1 – Counterparty analysis



Geographical analysis (Q1.1)

Table 2.4 – Geographical analysis

	December 2009		June 2009		December 2008	
	share	users	share	users	share	users
domestic	33.7%		34.1%		31.3%	
cross-border	48.1%		51.5%		51.0%	
anonymous	18.3%	37	14.5%	33	17.6%	38

The share of anonymous trading across ATS's jumped to a record 18.3% from 14.5% in June 2009, which would seem to reflect the continued attraction of central clearing counterparties (CCP) as a means of managing credit risk and perhaps also the new CCP facility in Italy. Within electronic business, the only significant change in the composition of business was a modest shift out of short dates, which fell back to 93.4% from 95.6%.

The composition of triparty surveys showed more dramatic changes, with transactions within the eurozone jumping to 41.6% from 32.1%, mainly at the expense

of business between eurozone and external counterparties, which fell to 39.4% from 47.4%.

Eurozone activity also increased in the voice-brokered market, as reported by the WMBA for London-based brokers, reaching 12.6% from 10.8%, while domestic business contracted to 40.1% from 42.8% and non-eurozone business decreased to 10.9% from 12.7%. The shift in the balance of voice-brokered business likely reflects the London focus of the WMBA and the importance to its members of sterling repo, which contracted sharply (see below).

Table 2.5 – Geographical comparisons in December 2009

	main survey	ATS	tri-party	WMBA
domestic	33.7%	40.9%	19.1%	40.1%
cross-border	48.1%	59.1%	80.9%	59.9%
anonymous	18.3%			

Figure 2.2 – Geographical analysis

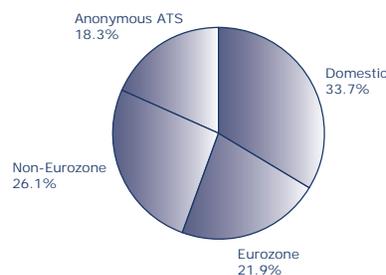


Table 2.6 – Cash currency analysis (Q1.3 and Q1.4)

	December 2009	June 2009	December 2008
EUR	65.6%	64.2%	70.6%
GBP	12.3%	15.3%	13.0%
USD	15.9%	14.2%	9.6%
DKK, SEK	2.4%	1.8%	2.4%
JPY	2.7%	3.1%	3.1%
CHF	0.5%	0.6%	0.6%
etc	0.5%	0.9%	0.8%
cross-currency	2.6%	1.3%	0.6%

The most noticeable change in currency composition was the sharp fall in the share of sterling to 12.3% from 15.3%, in response to fiscal concerns about the UK and perceptions of enhanced political risk. Sterling also lost ground in voice-brokered business (falling to 33.2% from 39.9%) but retreated only modestly in triparty activity and gained market share slightly in electronic trading.

The dollar continued to recover market share in the main

and triparty surveys, but the change was insignificant in electronic repo.

Figure 2.3 – Currency analysis

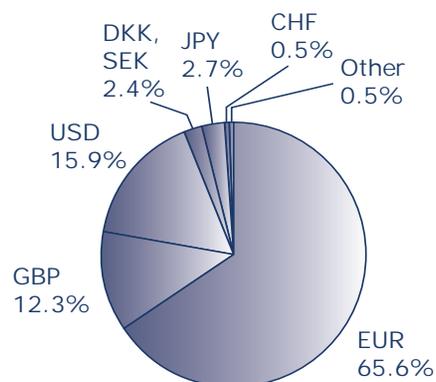


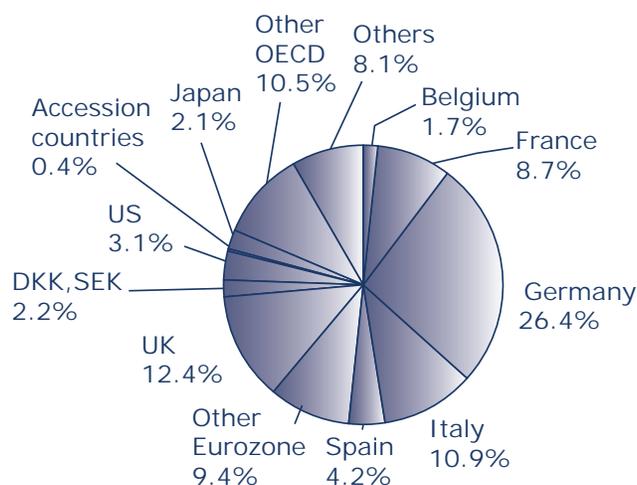
Table 2.7 – Currency comparison in December 2009

	main survey	ATS	tri-party	WMBA
EUR	69.6%	86.5%	69.6%	59.8%
GBP	12.3%	5.1%	6.7%	33.2%
USD	15.9%	0.6%	22.6%	3.7%
DKK, SEK	2.4%	0.0%	0.1%	2.2%
JPY	2.7%	N/A	0.5%	0.7%
CHF	0.5%	7.7%	0.5%	0.0%
etc	0.5%	0.1%	0.4%	0.4%
cross-currency	2.6%	N/A	15.3%	N/A

Collateral analysis (Q1.9)

Table 2.8 – Collateral analysis

	December 2009	June 2009	December 2008
Germany	26.4%	24.7%	29.6%
Italy	10.9%	11.2%	12.2%
France	8.7%	9.6%	10.1%
Belgium	1.7%	2.2%	2.7%
Spain	4.2%	4.7%	4.9%
other eurozone	9.4%	8.2%	8.7%
UK	12.4%	16.1%	12.9%
DKK, SEK	2.2%	1.3%	1.3%
US	3.1%	2.6%	2.9%
Accession countries	0.4%	0.3%	0.3%
Japan	2.1%	2.1%	2.9%
other OECD	10.5%	9.5%	7.3%
other	7.6%	6.9%	3.3%
equity	0.5%	0.7%	1.1%

Figure 2.4 – Collateral analysis

As on the cash side of repo business, the main development in collateral was triggered by fiscal and political concerns about the UK. There was a dramatic reduction in the share of UK collateral to 12.4% from 16.1%, which was reflected in a sharp fall in the share of EU government bonds (as a percentage of all EU fixed income collateral) to 76% from 83.6%. There was also a fall in the share of French government to 6.5% from 7.7%, continuing a trend decline seen since June 2008, and more modest falls in the shares of several other EU government bonds, with the notable exception of German government bonds. In contrast, the shares of non-government EU collateral generally increased.

In tri-party business, the share of French, German and UK government bond fell back significantly. The share of all government bonds also decreased, to 50.7% from 53%. The share of

German non-government collateral also fell sharply. The share of equity jumped to 14.2% from 0.6% (this number is volatile, reflecting the small number of triparty agents). At the same time, there was a shift out of government, public and supranational collateral (46.7% from 56.9%) and into corporate and covered bonds (34.6% from 26.3%). Structured and asset-backed collateral contracted to 5.5% from 7.9%.

Table 2.9 – Tri-party repo collateral analysed by credit rating

	Dec 2009	June 2009
AAA	47.7%	46.4%
AA	15.9%	18.7%
A	24.2%	23.1%
BBB	6.9%	5.4%
below BBB-	1.2%	1.6%
A1/P1	3.3%	4.0%
A2/P2	0.0%	0.1%
Non-Prime	0.0%	0.0%
unrated	0.9%	0.7%

Table 2.10 – Tri-party repo collateral analysed by type of collateral

	Dec 2009	June 2009
government securities	40.7%	42.0%
public agencies / sub-national governments	4.2%	4.9%
supranational agencies	1.8%	10.0%
corporate bonds	28.4%	21.3%
covered bonds	6.2%	5.0%
residential mortgage-backed	1.5%	1.6%
commercial mortgage-backed	0.6%	1.4%
other asset-backed	0.5%	1.2%
CDO, CLN, CLO, etc	1.2%	2.1%
convertible bonds	1.7%	1.6%
equity	11.8%	8.1%
other	1.4%	0.8%

Contract analysis (Q1.5)

The share of reported outstanding repo contracts negotiated electronically which took the form of undocumented buy-sell-backs fell to zero, reflecting the recent introduction of facilities in the domestic Italian repo market (which is entirely composed of buy-sell-backs) to report direct trades to the central clearing counterparty (CCP) through ATS’s. In the main survey,

the share of undocumented buy-sell-backs fell further to a new record low of 2.9% from 3.9%.

Figure 2.5 – Contract analysis

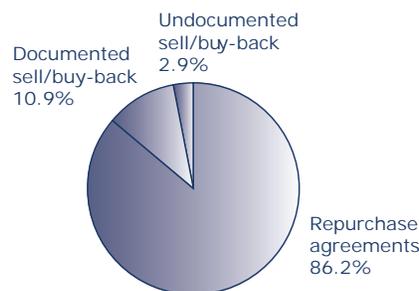


Table 2.11 – Contract comparison in December 2009

	main survey	ATS	tri-party
repurchase agreements	86.2%	59.0%	100.0%
documented sell/buy-backs	10.9%	41.0%	0.0%
undocumented sell/buy-backs	2.9%	0.0%	0.0%

Repo rate analysis (Q1.6)

The share of floating-rate repos (typically indexed to EONIA) continued to diminish, touching 7% from 8.5%, down from a record high of 13.3% in December 2007.

Figure 2.6 – Repo rate analysis

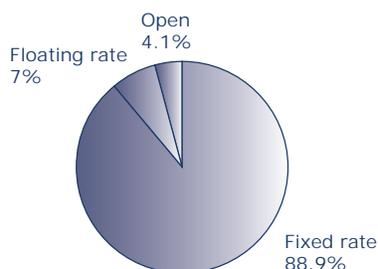
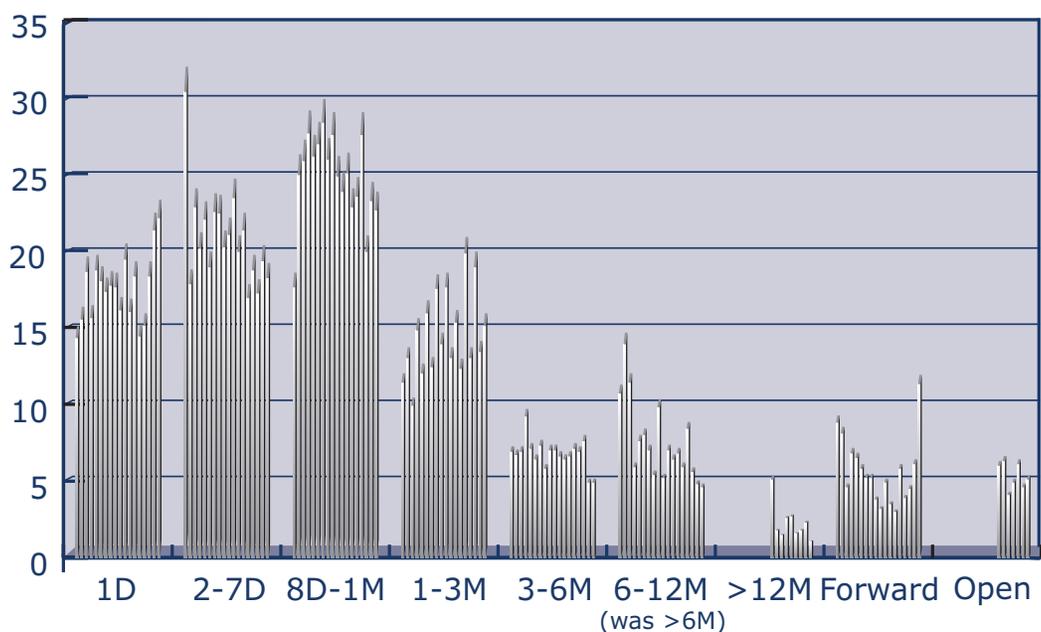


Table 2.12 – Repo rate comparison in December 2009

	main survey	ATS	tri-party
fixed rate	88.9%	89.6%	72.2%
floating rate	7.0%	10.4%	n/a
open	4.1%	0.0%	27.8%

Maturity analysis (Q1.7)**Table 2.13 – Maturity analysis**

	December 2009	June 2009	December 2008
1 day	22.1%	21.3%	18.3%
2 days to 1 week	18.2%	19.3%	17.2%
1 week to 1 month	22.6%	23.2%	19.9%
>1 month to 3 months	15.1%	13.4%	18.9%
>3 months to 6 months	4.9%	4.9%	7.6%
>6 months to 12 months	4.6%	4.8%	5.6%
>12 months	1.1%	2.3%	1.8%
forward-start	11.3%	6.1%	4.5%
open	5.1%	4.6%	6.1%

Figure 2.7 – Maturity analysis for all surveys

Repo with one day remaining to maturity continued the trend increase seen since December 2007, largely at the expense of terms beyond six months. Traditional seasonal patterns were weak. The most significant change was the jump in forward-start repo to 11.3% from 6.1%. Greater forward-start

activity tends to reflect increased interest rate positioning. However, the share of forward-start repos in the business reported by voice-brokers, who traditionally dominate this product, fell back to 42% from 45.7%. There was a sharp increase in open triparty repos to 25.5% from 20.1%.

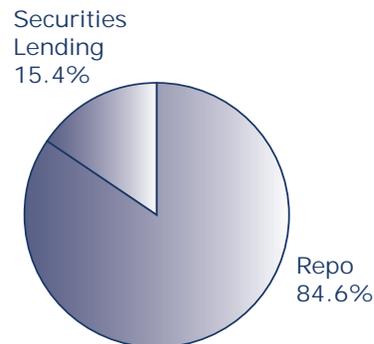
Table 12.14 – Maturity comparison in December 2009

	main survey	ATS	tri-party	WMBA
1 day	22.1%	80.1%	48.1%	3.8%
2 days to 1 week	18.2%	10.0%	8.6%	5.2%
1 week to 1 month	22.6%	3.3%	8.4%	15.9%
>1 month to 3 months	15.0%	2.6%	4.9%	19.4%
>3 months to 6 months	4.9%	1.5%	3.5%	6.5%
>6 months to 12 months	4.6%	1.7%	0.4%	5.9%
>12 months	1.1%	0.0%	0.4%	0.4%
forward-start	11.3%	0.8%	n/a	42.0%
open	5.1%	N/A	25.5%	1.1%

Product analysis (Q2)

Securities lending conducted on repo desks retreated to 15.4% from the high of 19.1%, to which it recovered in June 2009, from a record low of 12.5%.

Figure 2.8 – Product analysis

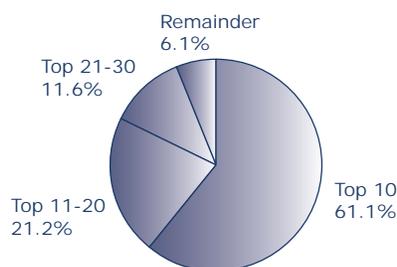


Concentration analysis

Table 2.15 – Concentration analysis

	December 2009	June 2009	December 2008
top 10	61.1%	57.2%	49.0%
top 20	82.3%	79.6%	77.3%
top 30	93.9%	92.1%	91.7%
other	6.1%	7.9%	8.3%

Figure 2.9 – Concentration analysis



December 2009 saw a further increase in the concentration of surveyed repo business, reflecting the role of a handful of well-placed institutions in expanding activity, as others continue to deleverage.

CHAPTER 3: CONCLUSION

The return of stability to the European repo market indentified in the last survey has been reinforced by vigorous growth of 20.2% (adjusted figure for comparison of the 51 banks that have been in both surveys) since June 2009. However, the aggregate numbers disguise the great variations between individual institutions. The high rate of growth was powered by a handful of institutions with unimpaired balance sheets and there is evidence of continued structural deleveraging by others.

While all electronic trading fell back from a record high in June 2009, anonymous electronic trading jumped to 18.3% from

14.5%, demonstrating the continued attraction of CCPs as a means of mitigating credit risk.

Continued prudence is also reflected in the dwindling share of undocumented sell/buy-backs.

Fiscal and political issues in the UK were reflected in sharp reductions in the shares of sterling and UK collateral, which in turn reduced the overall share of government bonds in the pool of collateral.

Forward repo leapt to a record high of 11.3%, suggesting banks are anticipating central bank tightening of interest rates.

Triparty repo lagged the overall market, which resulted in a sharp fall in market share to 8% from 11.1%.

APPENDIX A: SURVEY GUIDANCE NOTES

The following extract is based on the Guidance notes issued to participants in conjunction with the survey that took place on December 9, 2009.

The data required by this survey are: the total value of the repos and reverse repos booked by your repo desk that are still outstanding at close of business on Wednesday, December 9, 2009, and various breakdowns of these amounts.

Branches of your bank in other countries in Europe may be asked to complete separate returns. If your repo transactions are booked at another branch, please forward the survey form to that branch. If branches of your bank in other countries run their own repo books, please copy the survey form to these branches, so that they can also participate in the survey. Please feel free to copy the survey form to other banks, if you discover that they have not received it directly.

General guidance

a) Please fill in as much of the form as possible. For each question that you answer, you will receive back your ranking in that category.

b) If your institution does not transact a certain type of repo business, please enter 'N/A' in the relevant fields.

On the other hand, if your institution does that type of business but is not providing the data requested by the survey, please do not enter anything into the relevant field. If your institution does that type of business but has no transactions outstanding, please enter zero into the relevant field.

c) You only need to give figures to the *nearest million*. However, if you give figures with *decimal points*, please use full stops as the symbols for the decimal points, *not* commas. For *nil returns*, please use zeros, *not* dashes or text.

d) Please do not re-format the survey form, ie change its lay-out, and do not leave formulae in the cells of the underlying spreadsheet.

e) Include all repurchase agreements (classic repos), sell/buy-backs and similar types of transaction (e.g. pensions livrées). There is a separate question (see question 2) on securities lending and borrowing transactions (including securities lending and borrowing against cash collateral).

f) Exclude repo transactions undertaken with central banks as part of their official money market operations.

Other repo transactions with central banks, e.g. as part of their reserve management operations, should be included.

g) Give the value of the *cash* which is due to be repaid on all repo and reverse repo contracts (*not* the market value or nominal value of the collateral) that are still *outstanding at close of business on Wednesday, December 9, 2009*. This means the value of transactions at their repurchase prices.

h) "Outstanding" means repos and reverse repos with a repurchase date, or which will roll over on or after, Thursday, December 10, 2009. You should include all *open repos and reverse repos* that have been rolled over from Wednesday, December 9, 2009 to a later date and all *forward-forward repos and reverse repos* that are still outstanding at close on Wednesday, December 9, 2009.

i) Give separate totals for (a) repos including sell/buy-backs and (b) reverse repos including buy/sell-backs.

j) The survey seeks to measure the value of repos and reverse repos on a *transaction date basis*, rather than a purchase date basis. This means that you should include all repo and reverse repo contracts that have been agreed before close of business on Wednesday, December 9, 2009, even if their purchase dates are later.

k) Give *gross* figures, i.e. do *not* net opposite transactions with the same counterparty. If this is

not possible, please indicate that your figures are net.

l) In the case of equity repo, for synthetic structures, please give the value of the cash payment.

Guidance on specific questions in the survey form

1.1 Transactions (1.1.1) direct with counterparties or (1.1.2) through voice-brokers should *exclude* all repos transacted over an ATS (see below). These should be recorded under (1.1.3).

(1.1.2) Transactions through voice-brokers should be broken down in terms of the location of the counterparties, rather than the location of the voice-brokers.

(1.1.3) "ATSs" are automatic trading systems (e.g. BrokerTec/ICAP, Eurex Repo and MTS, but not voice-assisted electronic systems such as e-speed and GFInet). Transactions through voice-assisted systems should be included in (1.1.2). Anonymous transactions through an ATS with a central counterparty or CCP (e.g. CCG, LIFFE-Clearnet and Eurex Clearing) should be recorded in (1.1.3.4).

1.2 This item includes all the transactions recorded in (1.1.3) plus any transactions executed directly with counterparties and via voice-brokers which are then registered with and cleared through a central counterparty.

1.5 “Repurchase agreements” (also known as “classic repos”) include transactions documented under the Global Master Repurchase Agreement (GMRA) 1995 and the Global Master Repurchase Agreement (GMRA) 2000 *without* reference to the Buy/Sell-Back Annexes, and transactions documented under other master agreements. “Sell/buy-backs” are therefore taken to include all transactions that are not documented.

Repurchase agreements include pensions livrées. Repurchase agreements are characterised by the immediate payment by the buyer to the seller of a manufactured or substitute payment upon receipt by the buyer of a coupon on the collateral held by the buyer. If a coupon is paid on collateral during the term of a sell/buy-back, the buyer does not make an immediate manufactured or substitute payment to the seller, but reinvests the coupon until the repurchase date of the sell/buy-back and deducts the manufactured or substitute payment (plus reinvestment income) from the repurchase price due to be received from the seller.

Sell/buy-backs may be quoted in terms of a forward price rather than a repo rate. Where sell/buy-backs are documented (e.g. under the Buy/Sell-Back Annexes to the GMRA 1995 and GMRA 2000),

periodic adjustments to the relative amounts of collateral or cash - which, for a repurchase agreement, would be performed by margin maintenance transfers or payments - are likely to be made by early termination and adjustment or re-pricing. All open repos are likely to be repurchase agreements.

1.7 This section asks for the *remaining* term to maturity (not the original term to maturity) of repos to be broken down as follows:

(1.7.1.1) 1 day – this means:

- all contracts transacted prior to Wednesday, December 9, 2009, with a repurchase date on Thursday, December 10, 2009;
- overnight, tom/next, spot/next and corporate/next contracts transacted on Wednesday, December 9, 2009.

(1.7.1.2) 2–7 days – this means:

- all contracts transacted prior to Wednesday, December 9, 2009, with a repurchase date on Friday, December 11, 2009, or any day thereafter up to and including Wednesday, December 16, 2009;
- contracts transacted on Wednesday, December 9, 2009, with an original repurchase date no earlier than Friday, December 11, 2009, but no later than Wednesday, December 16, 2009 (irrespective of the purchase date, which will vary).

(1.7.1.3) More than 7 days but no more than 1 month – this means:

- all contracts transacted prior to Wednesday, December 9, 2009, with a repurchase date on Thursday, December 17, 2009, or any day thereafter up to and including Monday, January 11, 2010;
- contracts transacted on Wednesday, December 9, 2009, with an original repurchase date no earlier than Thursday, December 17, 2009, but no later than Monday, January 11, 2010 (irrespective of the purchase date, which will vary).

(1.7.1.4) More than 1 month but no more than 3 months – this means:

- all contracts transacted prior to Wednesday, December 9, 2009, with a repurchase date on Tuesday, January 12, 2010, or any day thereafter up to and including Tuesday, March 9, 2010;
- contracts transacted on Wednesday, December 9, 2009, with an original repurchase date no earlier than Tuesday, January 12, 2010, but no later than Tuesday, March 9, 2010 (irrespective of the purchase date, which will vary).

(1.7.1.5) More than 3 months but no more than 6 months – this means:

- all contracts transacted prior to Wednesday, December 9, 2009, with a repurchase date on Wednesday, March 10, 2010, or any day thereafter up to and including Wednesday, June 9, 2010;

- contracts transacted on Wednesday, December 9, 2009, with an original repurchase date no earlier than Wednesday, March 10, 2010, but no later than Wednesday, June 9, 2010 (irrespective of the purchase date, which will vary).

(1.7.1.6) More than 6 months but no more than 12 months – this means;

- all contracts transacted prior to Wednesday, December 9, 2009, with a repurchase date on Thursday, June 10, 2010, or any day thereafter up to and including Thursday, December 9, 2010;
- contracts transacted on Wednesday, December 9, 2009, with an original repurchase date no earlier than Thursday, June 10, 2010, but no later than Thursday, December 9, 2010 (irrespective of the purchase date, which will vary).

(1.7.1.7) More than 12 months – this means;

- all contracts transacted prior to Wednesday, December 9, 2009, with a repurchase date on Friday, December 10, 2010, or any day thereafter;
- contracts transacted on Wednesday, December 9, 2009, with an original repurchase date on or after Friday, December 10, 2010 (irrespective of the purchase date, which will vary).

(1.7.2) Forward-forward repos are defined for the purposes of this survey as contracts with a purchase date of Monday,

December 14, 2009, or later. There is therefore an overlap with corporate/next transactions. If the latter cannot be identified separately, it is accepted that they will be recorded as forward-forward repos.

(1.7.3) Open repos are defined for the purposes of this survey as contracts that have no fixed repurchase date when negotiated but are terminable on demand by either counterparty. This item should be equal to item (1.6.3).

1.8 Please confirm whether the transactions recorded in the various questions in (1.7) include your tri-party repo business. Some institutions do not consolidate their tri-party repo transactions with their direct or voicebrokered business because of delays in receiving reports from tri-party agents or the complexity of their triparty business.

1.9 Eurobonds should be included as fixed income securities issued "by other issuers" in the countries in which the bonds are issued. This will typically be Luxembourg (1.9.10) and the UK (1.9.15). Equity collateral should be recorded in (1.9.34).

(1.9.28) "US in the form of fixed income securities but settled across Euroclear or Clearstream" means only domestic and Yankee bonds. This includes Reg.144a bonds, but *excludes* Eurodollar and US dollar global bonds, which

should be treated as bonds issued "by other issuers" in the countries in which the bonds were issued.

This will typically be Luxembourg (1.9.10) and the UK (1.9.15).

(1.9.30) "Other OECD countries" are Australia, Canada, Iceland, Korea, Mexico, New Zealand, Norway, Switzerland, Turkey and the US. In the case of collateral issued in the US, only collateral settled across the domestic US settlement system should be included in (1.9.30). US collateral settled across Euroclear and Clearstream Luxembourg should be recorded in (1.9.28).

(1.9.34) "Equity" includes ordinary shares, preference shares and equity-linked debt such as convertible bonds.

2 "Total value of securities loaned and borrowed by your repo desk" includes the lending and borrowing of securities with either cash or securities collateral. Exclude any securities lending and borrowing done by desks other than your repo desk. If your repo desk does not do any securities lending and borrowing, this line will be a nil return.

3 "Active" means about once a week or more often.

For further help and information

If, having read the Guidance Notes, you have any further queries, please e-mail the ICMA Centre at reposurvey@icmagroup.org or contact one of the following members of the ERC Steering Committee:

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This survey is being conducted by the ICMA Centre, University of Reading, UK, at the request of ICMA's European Repo Council (ERC).

List of respondents	Dec -01	Jun -02	Dec -02	Jun -03	Dec -03	Jun -04	Dec -04	Jun -05	Dec -05	Jun -06	Dec -06	Jun -07	Dec -07	Jun -08	Dec -08	Jun -09	Dec -09
Dexia BIL					X				X	X	X		X				
Dexia Kommunal Bank Deutschland	X							X	X	X	X	X	X	X	X	X	X
Dresdner Bank	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
DZ Bank	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EFG Eurobank Ergasias		X	X			X		X	X	X	X	X	X	X	X	X	X
Egnatia Bank				X		X											
Erste Bank der Oesterreichischen Sparkassen	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Euroclear Bank			X	X		X	X	X	X	X	X	X	X	X	X	X	X
Eurohypo					X		X	X	X	X	X						
Eurohypo Europäische Hypotheckenbank												X	X	X	X	X	X
European Investment Bank		X				X	X										
Fortis Bank	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
General Bank of Greece		X	X														
Goldman Sachs	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Halifax Bank of Scotland	X	X	X	X	X	X	X	X	X	X							
HSBC													X		X	X	X
HSBC Athens		X															
HSBC France		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HSH Nordbank	X	X	X	X	X	X	X	X	X								
Bayerische Hypo-und- Vereinsbank	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IIB Bank				X													
ING Bank				X	X		X	X	X	X	X	X	X	X	X	X	X
ING Belgium		X	X	X	X				X	X	X						
Intesa SanPaolo	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
JP Morgan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
KBC	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
KfW						X	X	X		X	X	X	X	X			
Kingdom of Belgium Federal Public Service Debt Agency																	
Landesbank Baden Württemberg, Stuttgart	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Landesbank Hessen – Thüringen – Girozentrale (Helaba)					X	X	X	X	X	X	X	X	X	X		X	X
Landesbank Rheinland Pfalz	X	X	X	X	X	X	X	X	X	X	X	X					

List of respondents	Dec -01	Jun -02	Dec -02	Jun -03	Dec -03	Jun -04	Dec -04	Jun -05	Dec -05	Jun -06	Dec -06	Jun -07	Dec -07	Jun -08	Dec -08	Jun -09	Dec -09	
Landesbank Sachsen Girozentrale	x	x	x	x	x	x	x	x	x	x	x	x						
Lehman Brothers	x	x	x	x		x	x	x	x	x	x	x	x	x				
Maple Bank	x	x																
Merrill Lynch	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	
Mitsubishi Securities International	x	x	x	x	x	x	x	x	x							x	x	x
Mizuho International	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Morgan Stanley		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Natexis Banques Populaires	x	x	x		x													
National Bank of Greece	x	x	x	x	x	x	x	x	x	x	x	x				x	x	
Nomura International	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	
Norddeutsche Landesbank Girozentrale	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
Nordea Markets		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Norinchukin Bank					x	x	x	x	x	x	x	x					x	x
Nova Ljubljanska Banka d.d.						x						x	x				x	x
Omega Bank		x	x															
Piraeus Bank		x																
Rabobank	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Royal Bank of Scotland		x	x	x	x	x	x	x	x	x	x	x	x	x			x	x
RZB	x	x		x		x	x	x	x	x	x	x				x	x	x
Sal. Oppenheim Jr.	x	x			x	x	x					x						
Sampo Bank		x	x					x	x		x							
SEB	x		x															
Société Générale	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Toronto Dominion Bank				x	x													
UBS	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Ulster Bank		x	x			x	x	x	x		x							
Unicredit/Bayerische Hypo-un-Vereinsbank Milano Branch		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Unicredito Italiano Bank (Ireland)				x														
Vereins und Westbank		x	x	x	x	x												
Westdeutsche Immobilien Bank	x	x																
Westdeutsche Landesbank Girozentrale		x			x	x			x	x	x	x	x	x			x	
Zagrabacka Banka			x				x		x	x		x						

APPENDIX C: SUMMARY OF SURVEY RESULTS

Q1 What are the total gross values of cash due to be repaid by you and repaid to you on repo transactions maturing after Dec 9, 2009? (figures in EUR billions)					
	6,430	6,382	4,633	4,868	5,582
Of the amounts given in response to question (1) above:					
	Dec-06	Dec-07	Dec-08	Jun-09	Dec-09
1.1 How much was transacted:					
direct with counterparties					
• in the same country as you	20.2%	19.4%	17.6%	19.2%	19.7%
• cross-border in (other) eurozone countries	15.4%	14.9%	14.7%	13.1%	14.5%
• cross-border in non-eurozone countries	20.6%	19.8%	19.3%	19.8%	19.8%
through voice-brokers					
• in the same country as you	8.7%	11.3%	10.4%	10.3%	9.8%
• cross-border in (other) eurozone countries	7.6%	8.1%	5.5%	5.6%	5.0%
• cross-border in non-eurozone countries	3.9%	5.5%	4.3%	3.5%	3.8%
on ATs with counterparties					
in the same country as you	4.1%	4.1%	3.3%	4.6%	4.2%
• cross-border in (other) eurozone countries	2.4%	3.2%	3.9%	6.6%	2.4%
• cross border-border in non-eurozone countries	1.8%	3.2%	3.4%	2.8%	2.6%
• anonymously through a central clearing counterparty	15.2%	10.5%	17.6%	14.5%	18.3%
• total through a central clearing counterparty			33.2%	32.0%	29.4%
1.2 How much of the cash is denominated in:					
• EUR	64.7%	64.8%	70.6%	64.2%	65.6%
• GBP	13.1%	15.5%	13.0%	15.3%	12.3%
• USD	14.6%	11.7%	9.6%	14.2%	15.9%
• SEK, DKK	1.8%	2.4%	2.4%	1.8%	2.4%
• JPY	3.2%	3.7%	3.1%	3.1%	2.7%
• CHF	0.1%	0.2%	0.6%	0.6%	0.5%
• other currencies	2.4%	1.7%	0.8%	0.9%	0.5%
1.3 How much is cross-currency?	1.2%	2.3%	0.6%	1.3%	2.6%
1.4 How much is:					
• classic repo	83.4%	84.6%	84.7%	84.9%	86.2%

	Dec-06	Dec-07	Dec-08	Jun-09	Dec-09
• documented sell/buy-backs	11.2%	10.3%	11.1%	11.2%	10.9%
• undocumented sell/buy-backs	5.4%	5.0%	4.1%	3.9%	2.9%
1.5 How much is:					
• fixed rate	78.7%	82.2%	85.6%	86.5%	88.9%
• floating rate	10.2%	13.3%	9.3%	8.5%	7.0%
• open	11.1%	4.5%	5.1%	5.0%	4.1%
1.6 How much fixed and floating rate repo is (1.6.1) for value before December 12, 2010 and has a remaining term to maturity of:					
• 1 day	16.0%	14.4%	18.3%	21.3%	22.1%
• 2-7 days	19.9%	16.9%	17.2%	19.3%	18.2%
• more than 7 days but no more than 1 month	25.0%	23.5%	19.9%	23.2%	22.6%
• more than 1 month but no more than 3 months	15.3%	19.8%	18.9%	13.4%	15.1%
• more than 3 months but no more than 6 months	6.4%	7.1%	7.6%	4.9%	4.9%
• more than 6 months	6.4%	5.9%	5.6%	4.8%	4.6%
• More than 12 months	1.5%	2.7%	1.8%	2.3%	1.1%
• forward-forward repos	3.5%	5.8%	4.5%	6.1%	11.3%
• open	6.0%	4.1%	6.1%	4.6%	5.1%
1.7 How much is tri-party repo?	8.8%	9.1%	10.7%	13.2%	11.5%
• for fixed terms to maturity	85.4%	96.7%	89.3%	87.6%	88.5%
• on an open basis	14.60%	5.0%	9.4%	11.1%	8.0%
1.8 How much is against collateral issued in:					
Austria					
• by the central government	0.9%	1.1%	1.0%	1.0%	0.8%
• by other issuers	0.1%	0.2%	0.1%	0.2%	0.2%
Belgium					
• by the central government	2.5%	2.8%	2.6%	2.1%	1.6%
• by other issuers	0.3%	0.1%	0.1%	0.0%	0.1%
Denmark					
• by the central government	0.4%	0.1%	0.2%	0.1%	0.2%
• by other issuers	0.3%	0.2%	0.3%	0.4%	0.4%
Finland					
• by the central government	0.2%	0.2%	0.3%	0.2%	0.3%
• by other issuers	0.1%	0.1%	0.0%	0.0%	0.0%
France					
• by the central government	9.1%	8.7%	8.4%	7.7%	6.5%
• by other issuers	1.2%	1.0%	1.7%	1.9%	2.2%
Germany					
• by the central government	18.7%	19.4%	23.8%	19.3%	20.9%

	Dec-06	Dec-07	Dec-08	Jun-09	Dec-09
• pfandbrief	1.6%	1.5%	1.5%	1.5%	1.3%
• by other issuers	3.7%	4.2%	4.3%	3.9%	4.3%
Greece					
• by the central government	1.9%	2.0%	2.3%	2.3%	2.0%
• by other issuers	0.0%	0.0%	0.0%	0.1%	0.2%
Ireland					
• by the central government	0.3%	0.1%	0.3%	0.4%	0.6%
• by other issuers	0.3%	0.5%	0.4%	0.3%	0.9%
Italy					
• by the central government	13.5%	12.7%	11.8%	10.8%	10.3%
• by other issuers	0.6%	0.8%	0.4%	0.4%	0.6%
Luxembourg					
• by the central government	0.1%	0.0%	0.2%	0.2%	0.2%
• by other issuers	0.0%	0.8%	0.4%	0.4%	0.5%
Netherlands					
• by the central government	1.4%	1.7%	2.2%	1.8%	1.7%
• by other issuers	0.6%	0.7%	0.4%	0.4%	0.6%
Portugal					
• by the central government	0.7%	0.8%	1.1%	0.8%	0.9%
• by other issuers	0.0%	0.0%	0.1%	0.1%	0.4%
Spain					
• by the central government	3.6%	3.7%	3.6%	3.4%	3.2%
• by other issuers	0.9%	1.1%	1.3%	1.2%	1.0%
Sweden					
• by the central government	1.1%	0.7%	0.5%	0.4%	0.6%
• by other issuers	0.3%	0.4%	0.4%	0.4%	1.0%
UK					
• by the central government	11.5%	12.2%	10.6%	12.8%	7.7%
• by other issuers	2.1%	3.7%	2.2%	3.3%	4.7%
US but settled across EOC/CS	0.0%	2.3%	2.9%	2.6%	3.1%
other countries					
Bulgaria					
• by the central government	0.0%	0.0%	0.0%	0.0%	0.0%
• by other issuers	0.0%	0.0%	0.0%	0.0%	0.0%
Cyprus					
• by the central government	0.0%	0.0%	0.0%	0.0%	0.0%
• by other issuers	0.0%	0.0%	0.0%	0.0%	0.0%
Czech Republic					
• by the central government	0.0%	0.0%	0.0%	0.0%	0.0%
• by other issuers	0.0%	0.0%	0.0%	0.0%	0.0%
Estonia					
• by the central government	0.0%	0.0%	0.0%	0.1%	0.0%
• by other issuers	1.2%	0.0%	0.0%	0.0%	0.0%
Hungary					
• by the central government	0.0%	0.2%	0.1%	0.0%	0.1%
• by other issuers	0.0%	0.0%	0.0%	0.0%	0.0%

	Jun-06	Jun-07	Jun-08	Dec-08	Jun-09
Latvia					
• by the central government	0.0%	0.0%	0.0%	0.0%	0.0%
• by other issuers	0.0%	0.0%	0.0%	0.0%	0.0%
Lithuania					
• by the central government	0.0%	0.0%	0.0%	0.0%	0.0%
• by other issuers	0.0%	0.0%	0.0%	0.0%	0.0%
Malta					
• by the central government	0.0%	0.0%	0.0%	0.1%	0.0%
• by other issuers	0.2%	0.0%	0.0%	0.0%	0.0%
Poland					
• by the central government	0.0%	0.2%	0.1%	0.2%	0.2%
• by other issuers	0.0%	0.0%	0.0%	0.0%	0.0%
Romania					
• by the central government		0.0%	0.0%	0.2%	0.0%
• by other issuers		0.0%	0.0%	0.0%	0.0%
Slovak Republic					
• by the central government	0.0%	0.1%	0.0%	0.0%	0.0%
• by other issuers	0.0%	0.0%	0.0%	0.0%	0.0%
Slovenia					
• by the central government	0.0%	0.0%	0.0%	0.0%	0.2%
• by other issuers	3.0%	0.0%	0.0%	0.0%	0.0%
Japan	2.8%	2.3%	2.9%	2.1%	2.1%
other OECD	9.7%	7.4%	7.3%	9.5%	10.5%
non-OECD EMEA	0.7%	0.7%	0.5%	0.5%	0.5%
non-OECD Asian & Pacific	0.3%	0.4%	0.3%	0.2%	0.1%
non-OECD Latin America	0.6%	0.5%	0.3%	0.4%	0.2%
equity	1.0%	1.3%	1.1%	0.7%	0.5%
collateral of unknown origin or type	1.5%	2.1%	2.1%	5.8%	6.8%
Q2 What is the total value of securities loaned and borrowed by your repo desk: to/from counterparties					
in the same country as you					
• in fixed income	37.7%	35.4%	35.0%	48.3%	38.4%
• in equity	3.7%	4.6%	6.3%	2.0%	1.9%
cross-border in (other) eurozone countries					
• in fixed income	25.0%	31.8%	17.5%	20.7%	20.9%
• in equity	5.6%	5.1%	6.8%	2.7%	3.5%
cross-border in non-eurozone countries					
• in fixed income	26.7%	20.3%	33.2%	25.8%	35.4%
• in equity	1.2%	2.7%	1.3%	0.6%	1.4%
for which the term to maturity is					
• fixed	52.4%	61.5%	65.1%	80.8%	74.9%
• open	47.6%	38.5%	34.9%	19.2%	25.1%

APPENDIX D: THE EUROPEAN REPO COUNCIL

The European Repo Council (ERC) is the forum where the repo dealer community meets and forges consensus solutions to the practical problems of a rapidly evolving marketplace. In this role, it has been consolidating and codifying best market practice. The contact and dialogue that takes place at the ERC underpins the strong sense of community and common interest that characterises the professional repo market in Europe.

The ERC was established in December 1999 by the International Capital Market Association (ICMA, which was then called the International Securities Market Association or ISMA) as a body operating under ICMA auspices.

Membership of the ERC is open to any ICMA member who has commenced, or has undertaken to commence, a dedicated repo activity.

The ERC meets twice a year (usually in February/March and September) at different financial centres across Europe. The Steering Committee now comprises 19 members elected annually and meets four times a year.

More information about the ERC is available on www.icmagroup.org