
Competition and co-operation: developments in cross-border securities settlement and derivatives clearing

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European securities settlement systems and derivatives clearing houses are preparing for EMU by offering members clearing and settlement services in foreign as well as domestic instruments. This article outlines recent developments and new initiatives in cross-border securities settlement and derivatives clearing. It suggests that competition for post-EMU business is already resulting in increased co-operation, in the form of links between systems. These developments have implications for the risks in cross-border clearing and settlement and for market structure, and raise issues for central banks and regulators.

Introduction

European securities settlement systems and derivatives clearing houses are reviewing their strategies in advance of the introduction of the euro, and in anticipation of the consolidation of European systems expected in the medium term. Recent developments include initiatives by settlement systems and clearing houses to create or enhance links with their counterparts in other countries. This will enable them to broaden the services they offer beyond clearing or settlement of domestic instruments (mainly national government bonds and equities, or contracts listed on the local derivatives exchange) to foreign instruments, such as other EU governments' bonds. Settlement systems and clearing houses are also allowing foreign firms to become direct members without the need for a local presence ('remote access'). Similar trends have already been seen in European equity and derivatives exchanges.⁽¹⁾

These developments are likely to lead to further significant changes in cross-border clearing and settlement. Current arrangements rely heavily on intermediaries—banks acting as clearing agents or custodians in national clearing and settlement systems, on behalf of firms located abroad. As systems create further links between each other and offer remote membership, it is becoming increasingly possible for dealers and investors to clear and settle cross-border, without the need for intermediaries.

This article examines recent initiatives by both securities settlement systems and clearing houses for exchange-traded

derivatives,⁽²⁾ and considers the reasons behind the changes, and their implications. These include the ways in which such developments may affect the risks and efficiency of cross-border settlement mechanisms; the implications for market structure, in particular for the role of intermediaries; possible consolidation as a result of co-operation between systems; and issues for central banks and regulators.

Cross-border clearing and settlement

Most trades are cleared or settled domestically. For example, if two banks located in the United Kingdom trade a gilt, the transaction will typically be settled in the Central Gilts Office (CGO), the UK settlement system for government bonds (gilts).⁽³⁾ Other transactions require cross-border clearing or settlement:⁽⁴⁾

- A trade between two counterparties in different countries would be cleared or settled cross-border, either in the country where one of the counterparties is located, or in a third country. For example, if a bank in France enters into a long gilt futures contract on LIFFE⁽⁵⁾ with a UK futures dealer, the trade will be cleared at the London Clearing House (LCH).⁽⁶⁾
- A trade between two counterparties in the same country, but where the asset or derivative is located or listed abroad, would also be settled or cleared cross-border. For example, if two banks in the United Kingdom trade a eurobond, the transaction will be settled in Euroclear.⁽⁷⁾

(1) See Williamson, C (1997) 'Rationalisation of European equity and derivative exchanges', *Quarterly Bulletin*, November 1997, pages 406–12.

(2) This article looks at clearing of futures and exchange-traded options—contracts with standardised specifications determined by, and listed on, an exchange. It does not consider over-the-counter (OTC) derivatives, which are currently almost always settled bilaterally, with no central clearing house.

(3) The terms 'securities settlement system' and 'Central Securities Depository' (CSD) are used interchangeably in this article. The UK systems are the CGO, the Central Moneymarkets Office (CMO) and CREST (which settles mainly equities).

(4) A cross-border settlement is one that 'takes place in a country other than the country in which one trade counterparty or both are located': *Cross-border Securities Settlements*, Bank for International Settlements (1995), page 1.

(5) The London International Financial Futures and Options Exchange (LIFFE), the largest financial derivatives exchange in the United Kingdom.

(6) LCH provides clearing services for LIFFE, the London Metal Exchange (LME), the International Petroleum Exchange (IPE) and Tradepoint, an electronic stock exchange.

(7) Euroclear (and Cedel Bank) are International Central Securities Depositories (ICSDs), located in Belgium and Luxembourg respectively. They were originally set up to provide settlement and custody services for eurobonds. In recent years, both have developed links to national settlement systems, as well as between each other.

In derivatives markets, there is a distinction between clearing derivatives transactions cross-border and clearing derivatives based on foreign instruments. For example, LCH clears LIFFE futures and options contracts on German, Italian and Japanese government bonds, in addition to contracts based on UK instruments. However, the settlement of some margin payments and deliveries of the underlying instrument under such contracts are generally made cross-border, using the relevant payment or settlement system (such as Deutsche Börse Clearing, Cedel Bank or Euroclear for German government bonds).

The proportion of clearing and settlement that is cross-border is difficult to quantify. It is clear that as capital markets have become increasingly globalised, many firms want to trade instruments for which clearing and settlement is not available in the system of which they are a member, for example in order to gain exposure to foreign governments and corporate issuers, and to hedge their risks. The growth in collateral transactions (including repos⁽¹⁾ and securities lending), many of which involve counterparties located in different countries, has also fuelled growth in cross-border settlements. But calculations of clearing and settlement undertaken cross-border rely on surveys and national balance-of-payment statistics, which typically include figures only for gross purchases and sales of securities between residents and non-residents. Clearing houses and CSDs themselves may not always be able to identify whether clearing or settlement is cross-border; many of their members act both on their own account and as clearing agents or custodians for foreign investors. One indication of the growth of cross-border securities settlements is that the trades settled in Euroclear, which are largely cross-border, increased more than five-fold between 1991–97.⁽²⁾

Mechanisms for effecting cross-border clearing and settlement

A firm may clear or settle a transaction cross-border in one of three ways: by remote membership of the foreign system, via an intermediary who is a member of the foreign system, or in the system of which they are a member via a link with a foreign clearing or settlement system. Links between securities settlement systems usually take the form of one system becoming a member of the other and, in effect, acting as agent for its members in the foreign system.

Remote membership of the foreign system

Either party to a transaction may become a remote member of the system in which the transaction is cleared or settled. In practice, remote membership of clearing and settlement systems is rare. There are sometimes legal restrictions: system operators have to be satisfied that legal obligations of membership will be enforceable against remote members under the relevant foreign law. There may also be technical impediments to remote access—for instance if the

technology that links a system to its members cannot be extended outside the country of the system. In many cases, remote access to the payment system for securities transactions settled against payment has been restricted, usually to domestic banks. In any event, many dealers and investors wish to avoid being members of a number of systems, each with different technical requirements. In practice, the only systems with a wide range of remote members are the two International Central Securities Depositories (ICSDs), Euroclear and Cedel Bank. This reflects their origin as systems specialising in the settlement of international securities, for which the majority of the trading takes place in London.

In exchange-traded derivatives markets, some clearing houses now have remote clearing members. These must also be members of the associated exchange for which the clearing house clears. Membership of the exchange may in any case be open only to firms with a local presence, for example a physical presence on the trading floor, if trading is by open outcry. Even where non-resident exchange members can trade on an exchange remotely (as they can, for example, on the Deutsche Terminbörse (DTB) via an electronic terminal located outside Germany), they may still need to clear through a local agent.

Use of an intermediary

The most common method by which a counterparty clears or settles cross-border is to use the services of a direct participant in the foreign system, often a local custodian bank or specialist clearing agent. Many investors appoint a global custodian or global clearing agent with a presence in all the major foreign centres to act on their behalf in different markets. A global custodian may itself appoint a local bank as sub-custodian or use an ICSD to effect some settlements.

In securities markets, global custodians offer not only settlement services but a full range of banking and custodial services. In derivatives markets, the local clearing agent might also act as the broker for the foreign counterparty, providing both trade execution and clearing services. This is typically the case where trading on the exchange requires a physical presence.

Links between systems

Links between clearing houses or settlement systems enable counterparties in different countries to clear or settle a transaction through the clearing house or settlement system of which they are a member. Links therefore avoid the need for foreign counterparties to a trade to be remote members of, or to appoint agents in, the system in which the transaction is cleared or settled.

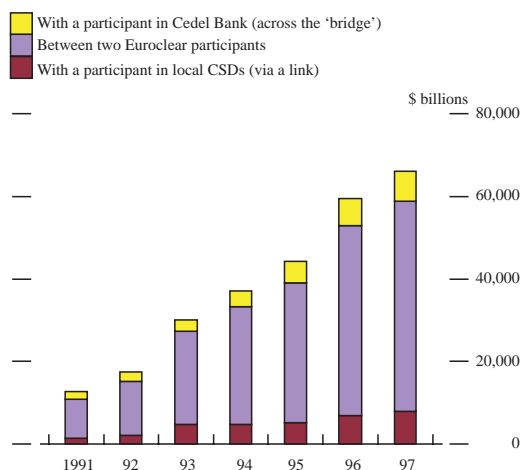
The technical sophistication of such links varies. Simple telephone communications may be sufficient in some cases,

(1) A sale and repurchase agreement, typically of government bonds.
(2) Source: Euroclear.

where volumes are low. Perhaps the most advanced and high-volume link between securities settlement systems is that between Euroclear and Cedel Bank—the ‘bridge’. The bridge enables members of one system to settle transactions on a ‘delivery versus payment’ (DvP) basis with members of the other system.

Euroclear and Cedel Bank also have the most extensive links to other securities settlement systems. At the end of 1996, Euroclear had 29 links to national CSDs and Cedel Bank had 35.⁽¹⁾ As Chart 1 shows, around 25% of all settlements in Euroclear are between a Euroclear participant and a participant in a foreign system, either Cedel Bank or a national CSD; the majority of other settlements in Euroclear are in securities previously transferred into the system via a link to a national CSD. Links between national CSDs are less developed at present. They include Deutsche Börse Clearing’s links to eight CSDs and to both ICSDs, and Sicovam’s links to 22 CSDs. The volume of settlements across these links has been low.

Chart 1
Settlements in Euroclear



Source: Euroclear.

There are currently fewer links between derivatives clearing houses than between CSDs. This is because clearing houses have been able, and to date have preferred, to clear contracts based on foreign underlying instruments (such as the LIFFE German government bond contract) that are listed on the derivatives exchange for which they provide clearing services, rather than clearing such contracts by linking to the clearing house of a foreign derivatives exchange. This reflects the primary role of derivatives clearing houses in clearing for a local exchange, which is often also the owner or part-owner of the clearing house.

Many links between derivatives clearing houses are designed to facilitate out-of-hours trading of liquid, popular

contracts. They allow members of a clearing house to trade such contracts on a derivatives exchange in a different time zone, but have them cleared at their own clearing house. For example, a member of the Tokyo International Financial Futures Exchange (TIFFE)⁽²⁾ can open a euroyen futures position on LIFFE but clear it at TIFFE; and a member of the Chicago Mercantile Exchange (CME) can open a eurodollar futures position on SIMEX⁽³⁾ and have it cleared at the clearing-house division of the CME. The links between OM Stockholm and OMLX,⁽⁴⁾ and their links with two other Scandinavian markets, NOS⁽⁵⁾ and SOM,⁽⁶⁾ are the only current examples of links between clearing houses in the same continent. Members of any of these clearing houses can trade with a member of any of the participating exchanges via their joint electronic orderbook and clear the trade locally. These arrangements are described in more detail in the box on page 161.

The different mechanisms for cross-border clearing and settlement are in practice used in combination. For example, a global custodian appointed by an investor in one country might itself settle some cross-border transactions using an ICSD; the ICSD could settle these via a link to a CSD in another country. In addition, most of the ICSDs’ links to national CSDs make use of a custodian bank acting as local agent for the ICSD. It is therefore common for an investor holding a security issued in a national depository in a foreign country to hold it via more than one intermediary. Such chains of intermediaries also occur in domestic business—many investors choose to hold their securities via a custodian, rather than by direct membership of a CSD—but they are more common in cross-border settlements.

Risks involved in cross-border clearing and settlement

All these mechanisms for cross-border settlement expose parties to risks. Most of these risks also arise in domestic clearing and settlement, but they may be more difficult to manage if more than one jurisdiction is involved; others are unique to cross-border clearing and settlement. These risks are generally borne directly by the participants in clearing and settlement systems, but they may fall to the systems themselves.

● Legal risks

The legal framework for securities settlement and derivatives clearing may not be the same in all countries relevant to a trade that is cleared or settled cross-border.⁽⁷⁾ Where there is a conflict of law, participants may be vulnerable to claims of third parties if there is an insolvency. Any transaction where securities are held via a chain of intermediaries raises questions about what the relevant law is. Rights of property are generally determined by the law

(1) Sources: Euroclear and Cedel Bank.

(2) Some clearing houses are divisions of an exchange and often share the same name. For example, TIFFE refers both to the exchange and to the entity that provides clearing services for the exchange. Others do not share the name of an exchange—for example LCH and LIFFE, LME, IPE and Tradepoint.

(3) The Singapore International Monetary Exchange.

(4) OMLX, the London Securities and Derivatives Exchange; the same entity also provides clearing services for the exchange.

(5) The Norwegian Futures and Options Clearing House, the clearing house for the Oslo Stock Exchange.

(6) The Finnish Options Market, the clearing house for the Finnish Securities and Derivatives Exchange.

(7) The relevant jurisdictions include the countries where each counterparty is located, where any custodian is located, where the settlement system or clearing house is located, and where the issuer of the security or the exchange listing the derivative is located.

Links between exchange-traded derivatives clearing houses

Links between clearing houses take a number of forms, depending on the services that they offer to their members and the nature of the trading arrangements they support.

Cross-clearing links to support cross-listing arrangements

Links between clearing houses are often established to facilitate a cross-listing arrangement between two exchanges. Trading of a contract introduced by one exchange (the ‘home’ exchange, usually the primary exchange for trading of the contract subject to the link) can also take place on an exchange in another country (the ‘away’ exchange), usually when the home exchange is closed. The home and away exchanges are typically located in different time zones; in effect, the link extends the trading hours of the cross-listed contract.

In the simplest type of arrangement, the clearing houses link to facilitate the transfer of positions in the contract executed on the away exchange back to the home exchange, whose clearing house clears all positions in the cross-listed contract. Positions are held temporarily at the clearing house for the away exchange, pending transfer at the end of the trading day; members of the clearing house for the away exchange then need to use members of the clearing house for the home exchange as local agents. Examples include the LCH-TIFFE link for euroyen futures.

In more complex arrangements, both clearing houses clear the cross-listed contract. A firm can open a position on the away exchange and have it cleared at the away clearing house; alternatively, it may choose to have its positions in the contract transferred back to the clearing house for the home exchange, clearing through a local agent. Where the two counterparties to a transaction have their trades cleared at different clearing houses, the clearing houses involved become counterparties to each other. Examples of such arrangements include the link between the clearing-house divisions of the CME and SIMEX for eurodollar futures and euroyen futures, and the link between LCH and SIMEX for Brent crude oil futures. Both these links are known as ‘mutual offset’ arrangements.

Cross-clearing links to support joint electronic orderbooks

The exchanges in the Swedish OM group have established common trading platforms with each other and the Norwegian

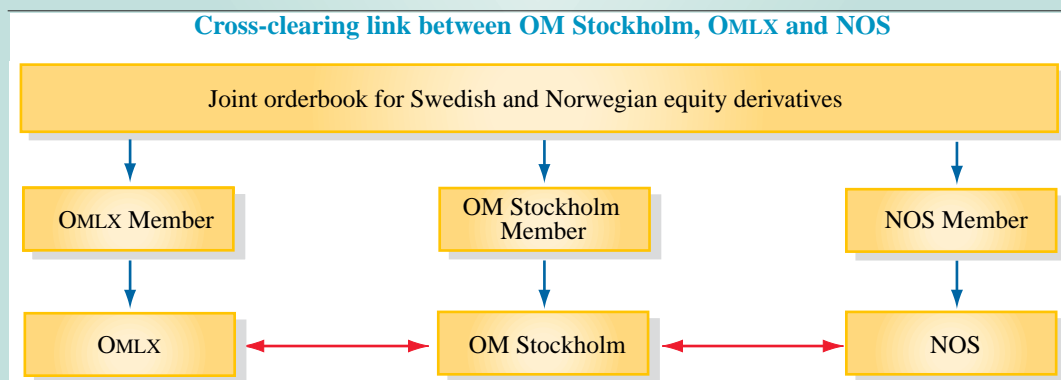
and Finnish derivatives markets in the form of joint electronic orderbooks: these are supported by cross-clearing links. Members of participating exchanges are able to trade derivatives contracts introduced by the other exchanges. As with a mutual offset arrangement, this type of link allows members of one clearing house to trade and clear a foreign contract locally: members can execute a trade in any contract listed on the electronic orderbook, but clear only at the clearing house of which they are a member, irrespective of whether the contract is local or foreign and of where the counterparty is located.

The current joint orderbook arrangements are between: OM Stockholm and OMLX, for almost all products traded on each exchange; OM Stockholm, OMLX and NOS, for Norwegian and Swedish equity futures and options; and OM Stockholm, OMLX and SOM, for Finnish bond and interest rate derivatives.

The link between OM Stockholm, OMLX and NOS is shown in the diagram below. The blue arrows relate to trade execution: a firm enters into a contract listed on the joint orderbook; it is cleared at the clearing house of which the firm is a member. Where the counterparties to a trade are members of different clearing houses, there are inter clearing house transfers of payments and settlements relating to margin and contract deliveries (these are shown as red arrows).

Cross-clearing links: joint clearing of a contract traded on a single exchange

Clearing houses can also link to facilitate joint clearing: members can open a position in a contract on a single exchange, but choose the clearing house at which they will have it cleared. Until August 1997, LCH and MATIF, the French financial derivatives exchange and clearing house, had a joint clearing arrangement for BCC⁽¹⁾ white sugar futures. Members of the commodity exchange could open a position in the contract and decide whether to have it cleared by LCH or MATIF. To effect inter clearing house transfers of payments and settlements relating to margin and contract deliveries, LCH became a member of MATIF. The principle behind this arrangement was similar to the CSD-to-CSD links described in the box on page 163.



(1) Banque Centrale de Compensation (BCC) is a commodity futures clearing house and a wholly-owned subsidiary of MATIF.

of the jurisdiction where the property in question is located, the '*lex situs*', which is itself usually determined by the physical location of a paper instrument or the location of the registrar of the security. But where securities are held in dematerialised form via multiple intermediaries in different countries, the *situs* and so the applicable law may be less clear. In Europe, prospective changes in relevant laws, notably the Settlement Finality Directive,⁽¹⁾ will help to clarify the position.

● *Custody risks*

The use of intermediaries to settle a security or clear a derivatives transaction potentially exposes the participant to loss in the case of the insolvency, negligence or fraud of an intermediary. Regulators generally require an intermediary to segregate the assets and derivatives positions of its customers, at least from the intermediary's own assets and sometimes also from the assets of other customers. Even if segregation is effective, the customer may have difficulty in transferring its instruments promptly in the event of an insolvency.

● *Settlement risks*

If delivery and payment do not take place simultaneously, an institution may be at risk of losing the full value of securities or funds that they have transferred to a defaulting counterparty. In securities markets, achieving DvP may be more difficult for a cross-border than a domestic settlement, since more than one system is involved. Even where DvP is available, to protect dealers and investors, it needs to be clear when transfer of securities and payment of funds are irrevocable and unconditional. If there is a settlement between a system settling with intra-day finality and one with only end-of-day finality, deliveries in the first system will be available for re-use by the receiving member only at the end of the day.

● *Operational risks*

Effecting clearing and settlement across links between systems raises particular issues about the robustness of these links and their technical arrangements. A failure in one system may delay clearing or settlement in the other, exposing members to liquidity risks—that obligations owing to them may not be settled when due.

Links may also create exposures between systems. In a link between securities settlement systems that involves providing credit or lending securities to bridge a gap between final delivery in one system and final receipt in the other, there may be a credit exposure between the two systems. In a link between clearing houses where each counterparty to a derivatives trade clears its side of the transaction at different clearing houses, the systems are exposed to each other in respect of transfers of payments and settlements relating to margin and contract deliveries.

Recent developments

Securities settlement

Many European CSDs are currently upgrading their services, in particular by introducing real-time gross settlement facilities to enable participants to settle trades throughout the day on a DvP basis. These improvements are also taking place in cross-border settlement: some links between systems are being upgraded to provide for real-time gross settlement cross-border. Euroclear, for example, plans eventually to upgrade its links to national markets and the bridge to Cedel Bank on this basis.

One of the most significant recent initiatives is the proposal of the European Central Securities Depositories Association (ECSDA), the grouping of national private sector CSDs, to develop links between each other. Details of the proposed model are given in the box on page 163. The principle is that an investor may hold securities issued into any participating CSD, using any CSD as a point of access. The initiative was conceived as a means of reducing risk and increasing efficiency in central bank credit operations involving cross-border use of collateral in Stage 3 of EMU, but it will be available to all members of participating systems. Already, the French and German systems plan to introduce an upgraded version of their existing link later this year. In January 1998, the Danish CSD (VP) and its Swedish counterpart (VPC) announced plans to establish a facility enabling the book-entry transfer of securities between them. This is the first step towards a planned joint settlement facility.

In the United Kingdom, CRESTCo plans to create links to a number of EU systems, possibly later this year.⁽²⁾ As part of a consultative exercise on the development of securities settlement in the United Kingdom, the Bank of England has been seeking views on the demand for such links from users of UK settlement systems.⁽³⁾ Euroclear and Cedel Bank's links to CGO (both are members of the system) are currently the only direct links involving UK systems.

Some systems have amended their rules to permit remote access. Deutsche Börse Clearing now admits members located abroad. DTC, the US settlement system, has set up an office in London to facilitate remote settlement of US instruments. Euroclear and Cedel Bank, though not members of the ECSDA, are likely to increase their links to EU national CSDs. Most of their links are currently one-way, enabling the ICSDs to settle securities issued in national CSDs; CSDs do not, however, always have the facility to settle in the ICSDs.

Derivatives clearing

Until relatively recently, links between derivatives clearing houses have often involved cross-clearing arrangements to support cross-listing of contracts on derivatives exchanges.

(1) Proposal for a Directive of the European Parliament and of the Council on settlement finality in payment and securities settlement systems—5943/98.

(2) *Cross-border settlement*, CRESTCo (1997).

(3) *Securities Settlement Priorities Review*, Bank of England (1998). Copies can be obtained from Public Enquiries, Bank of England, Threadneedle Street, London, EC2R 8AH. Telephone: 0171-601 4012.

ECSDA proposed model for CSD-to-CSD links

The European Central Securities Depositories Association (ECSDA), the grouping of European national private sector CSDs, published proposals in July 1997 for a standard model for links between its members.⁽¹⁾

The key principle of the ECSDA model is that the CSD of an investor's country (the investor CSD) provides a single point of entry that allows the investor to hold securities issued into any other participating CSD (the issuer CSD). The model envisages each CSD in effect acting as the custodian of its members' holdings of securities issued into other CSDs. Each CSD will open an omnibus account at the others for this purpose; the issuer CSD may not need to keep records of individual participants who hold securities through investor CSDs. Transfers can take place between participants in the investor CSD without being reflected at the issuer CSD (unless, for example, this is needed to record a pledge, or the investor CSD operates sub-accounts for each of its participants). The investor CSD will be expected to provide custody services to its members in foreign securities, such as receiving dividend payments and acting on corporate events, supported by the issuer CSD.

ECSDA has sought to address some of the common risk-management issues associated with cross-border

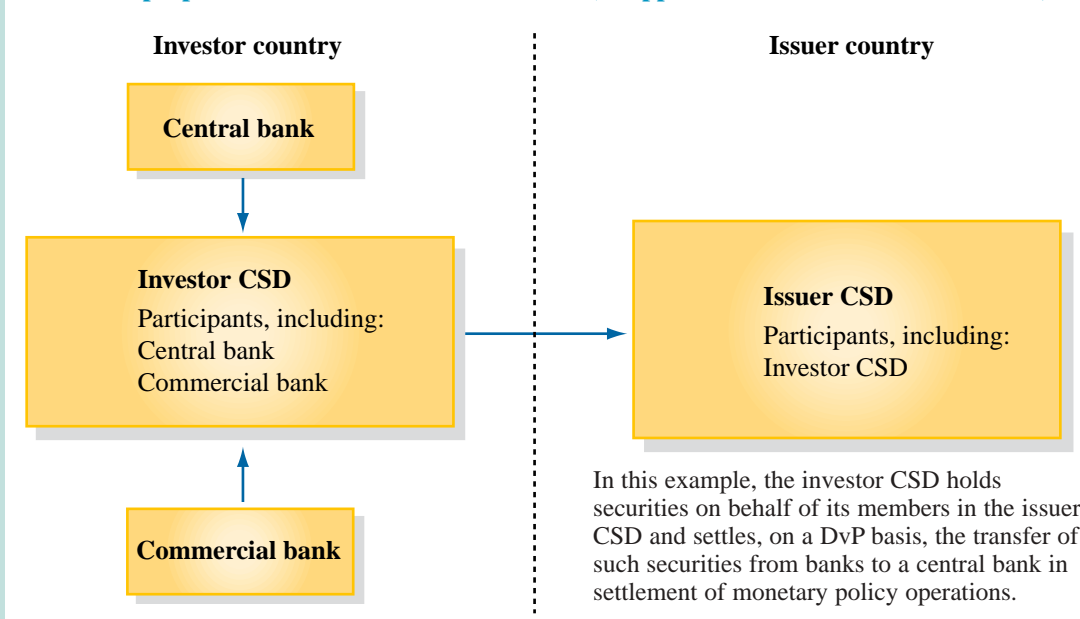
settlement. Its approach is to set minimum standards for the CSDs in line with the EMI's standards for ESCB credit operations.⁽²⁾ These include standards for operating times, intra-day finality for settlement, settlement in central bank money, and avoidance of credit risk by CSDs. A common approach to communications between CSDs is being developed. These will all be electronic and will use standard message formats, enabling all CSDs to participate in the links without having to conform to different technical standards for each link.

Initially, ECSDA proposes that the model will be used for cross-border settlements only on a free-of-payment basis, but it will be developed to provide DvP settlement in due course.

In many EU countries, there is more than one CSD, usually where the central bank runs the settlement system for government bonds or where, as in the case of Belgium, there is an ICSD (Euroclear) as well as national CSDs. ECSDA favours choosing a single system as a gateway to such countries.

ECSDA has also established working groups to consider the legal aspects of links, the development of DvP functionality, and the message structures and communication networks required to support these links.

The ECSDA proposed model for CSD-to-CSD links (as applied to central bank transactions)



(1) *Report on the Infrastructure for Securities Settlement: Collateral Management for the Purposes of the ESCB Credit and Monetary Policy Operations*, European Central Securities Depositories Association (1998).

(2) *Standards for the Use of EU Securities Settlement systems in ESCB Credit Operations*, European Monetary Institute (1998).

But with the exception of the CME-SIMEX link, these links have not generated significant turnover for the participating exchanges or, consequently, their clearing houses. They have also been expensive to negotiate and implement. By contrast, business has increased as a result of OM Stockholm and OMLX's links with NOS and SOM to support joint electronic orderbooks. Since the incorporation of the Oslo Stock Exchange in the joint electronic orderbook and NOS in the cross-clearing link on 14 February 1997, the volume of Norwegian equity products has increased by almost 25%, mainly from trading in London and Stockholm.⁽¹⁾

The most significant recent initiatives in derivatives trading and clearing involve EUREX, the single entity that will be created from the merger of the German and Swiss derivatives exchanges and clearing houses (planned for summer 1998). EUREX and MATIF announced in September 1997 that they would create a trading and clearing link (the 'Euro Alliance'). By October 1998, all EUREX and MATIF bond and short-term interest rate derivatives will be listed and traded on a single orderbook. But there will be no clearing link: members of EUREX and MATIF will have to use agents to clear contracts at the other clearing house, as they do at present. In the second stage, provisionally from the middle of next year, a clearing link will be added. As a final step, the Euro Alliance aims to establish in January 2002 a single clearing house for all derivatives products traded on the joint orderbook.

In March this year, it was announced that EUREX will also form an alliance with the Chicago Board of Trade (CBOT); the aim is to establish a global electronic derivatives market, eventually including an exchange from the Asia-Pacific region. There are as yet no details on how any clearing arrangement to support the link would work.

Reasons for the changes

In Europe, increased cross-border trading of derivatives and securities occurring in anticipation of the euro⁽²⁾ has been the main impetus behind the higher volumes of transactions requiring cross-border clearing and settlement. Post-EMU, the removal of currency risk for participating countries is expected to lead to increased trading in foreign instruments. But EMU will also reduce the range of available currency and interest rate derivatives, and is expected to lead to decreased volatility in government bond yields for participating countries. Most EU securities settlement systems and many derivatives clearing houses now see it as a key part of their strategy to offer their members clearing and settlement services in a wide range of foreign as well as domestic products.

At the same time, Single Market legislation has removed some barriers to certain forms of cross-border clearing and settlement, encouraging systems to provide direct access to

members located abroad. The Investment Services Directive has also facilitated remote trading, allowing exchanges recognised in one EU Member State access to other Member States. In derivatives markets, this may create an impetus for remote clearing. At present, firms can trade remotely, but may have to clear through a local agent.

The changes in cross-border payment arrangements with the introduction of the euro may also facilitate cross-border clearing and settlement. TARGET, the pan-European interbank funds transfer system, will link domestic payment systems; and the Euro Bankers' Association (EBA), formerly the Ecu Bankers' Association, has developed a multilateral clearing and settlement system in euros. These developments may make it easier for the cross-border payments associated with cross-border transactions in securities to be completed at the same time as the real-time settlement of the cross-border securities delivery, thereby facilitating cross-border DvP.

Implications and outlook

Although the shape of EU securities settlement and derivatives clearing in the next few years is difficult to forecast, significant change is likely. There are a number of issues:

(i) Market structure

Investors now have an increasing number of options for effecting cross-border clearing and settlement. Increased direct access to the settlement of foreign securities and clearing derivatives listed on a foreign exchange, via remote membership of foreign systems or through domestic systems' links abroad, may reduce investors' dependence on intermediaries for cross-border business.

Intermediaries are, however, likely to remain a key feature of cross-border clearing and settlement. Custodians and clearing agents will compete with the new methods of clearing and settling transactions cross-border on the basis of the quality and range of services that they offer. In the securities markets, it may be difficult for national systems currently orientated towards domestic business to match the services provided by the large custodians. They may be able to compete, however, on the basis of efficient, low-cost execution services in foreign securities. Euroclear and Cedel Bank, the established systems specialising in cross-border settlements, are mounting strong challenges to prevent their business being eroded.

In the derivatives markets, much may depend on whether open-outcry floor trading survives the threat posed by electronic trading—where trading requires a local presence, local agents are likely to continue to be used for cross-border trade execution and clearing. Further growth in remote screen-based trading may, however, fuel demand for remote access also to clearing systems.

(1) By contrast, the volume of Swedish equity products traded in Norway is low.

(2) For example, 'convergence plays' based on differentials between government bond yields and interest rates of prospective participants in EMU.

Of course, developments in clearing and settlement may also have a significant effect on the volumes of securities and derivatives traded. For example, investors who do not currently participate in a foreign market may be attracted to trading derivatives listed on a foreign exchange or holding foreign assets if they are able for the first time to clear or settle them in a familiar local clearing house or settlement system.

(ii) Competition or consolidation?

Increased competition is widely expected to be a precursor to consolidation of systems in the medium term. In derivatives markets, there is already a clear trend towards rationalisation, as evidenced by EUREX and its proposed alliances. This reflects the expectation that competition between exchanges and clearing houses for the contracts remaining after the introduction of the euro will not be sustainable. This trend has yet to emerge in securities settlement, with the exception of the planned consolidation between the Danish and Swedish CSDs. Most European CSDs see co-operation as the way forward in the short to medium term, as evidenced by the creation of links. But in the longer run, securities settlement in Europe is also expected to consolidate into a small number of systems.

(iii) Implications for the authorities

The implications of increased cross-border clearing and settlement, and the developments in cross-border clearing and settlement mechanisms, are attracting increased attention from central banks and regulators. There is now a recognition that the legal and risk management issues that it raised need to be reflected in the approach to

regulation of the service providers, particularly custodians and CSDs; and that regulators need to co-ordinate their supervisory activities to ensure that any problems in cross-border clearing and settlement can be understood and managed.

The G10 central banks have recognised the importance of cross-border issues and have analysed in recent reports the risks arising in cross-border securities settlement and derivatives clearing.⁽¹⁾ The G10 central banks and regulators have also produced a disclosure framework for securities settlement systems, in which systems are required to describe their operations and the risks involved for participants, including the risks involved in links to other systems.⁽²⁾ In Europe, the European Monetary Institute has established standards to be met by securities settlement systems that will be used in the settlement of central bank operations in the euro.⁽³⁾ European central banks are now assessing CSDs against these standards, one of which is the security and robustness of their links with other settlement systems. In derivatives markets, the collapse of Barings in February 1995 illustrated the need for national regulators to co-operate; one outcome was the Windsor Declaration,⁽⁴⁾ which promoted information-sharing between regulators, both routinely and in emergencies.

In the final analysis, the extent to which EMU will change the nature of the risks of clearing and settling cross-border, and market structures, is hard to predict with certainty. The full effect of the euro on cross-border business will be seen only once investors make their decisions on which clearing and settlement mechanisms to use in the changed framework that the single currency will bring.

(1) *Cross-border Securities Settlements*, Bank for International Settlements (1995); *Clearing Arrangements for Exchange-Traded Derivatives*, Bank for International Settlements (1997).

(2) *Disclosure Framework for Securities Settlement Systems*, G10 central banks' Committee on Payment and Settlement Systems (CPSS) and the International Organisation of Securities Commissions (IOSCO) (1997). Systems' responses to the disclosure framework are publicly available; many have been posted on the BIS website, <http://www.bis.org>. For further information, see Allen, H (1998), 'Disclosure Framework for Securities Settlement Systems', *Financial Stability Review*, Issue 4, May.

(3) *Standards for the Use of EU Securities Settlement Systems in ESCB Credit Operations*, European Monetary Institute (1998).

(4) Issued by 16 regulatory bodies responsible for supervising the major exchange-traded derivative markets and clearing houses, 18 May 1995.