

THE EURO AREA SECURITIES CLEARING AND SETTLEMENT INFRASTRUCTURE: RECENT CHANGES AND ISSUES FOR DEBATE¹

The infrastructure for securities clearing and settlement in the euro area is currently being shaped. While, in the field of payment systems, the TARGET system allows for the real-time transfer of cash between any of the 5,000 participants throughout the European Union, the infrastructure for securities settlement is fragmented in a multiplicity of systems which is hindering the integration of the euro area financial markets. As a result, it is no easier for a euro area bank to settle trades denominated in euro than in other currencies. The introduction of the euro has triggered the consolidation of these systems, as a result either of mergers, alliances or links. The emergence of Clearstream (merger between Cedel and DBC), the agreed merger between Euroclear and Sicovam; the alliance SEGA-CREST, the agreement between Clearnet and London Clearing House and the merger between the Amsterdam, Brussels and Paris stock exchanges are important steps towards the consolidation of the industry.

The aim of this note is to present a set of issues of debate in the field of securities settlement. The outcome of these issues will define the future securities clearing and settlement infrastructure of the euro area.

In Section 1 the note evaluates the merits of both gross and net settlement systems.

Section 2 presents the issues concerning consolidation of trading, clearing and settlement procedures.

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1. Gross and net settlement systems

1.1 An overview of existing literature²

Academic literature normally describes the debate between gross and net settlement in terms of a trade-off between cost and systemic risk, associated with different methods developed to contain systemic risks in payment systems.

Large-value payment arrangements are less costly if they settle net (bilateral or multilateral) payment balances at the end of the business day in a net settlement (NS) network. On the other hand, real-time gross settlement (RTGS) networks – which settle each payment as it occurs during the day – are in principle more expensive because participants have to hold enough idle balances to cover all payments made during the day or post enough collateral to cover all the net debit positions generated when a balance is insufficient. Holding an adequate idle balance is more expensive than posting collateral, but either procedure reduces systemic risk.

Systemic risk is the risk that the inability of one participant to meet its obligations when due will cause other institutions to be unable to meet their obligations when due. The risk stems from the fact that members rely on incoming deliveries/payments to make their own deliveries/payments. Systemic risks are not exclusive to net settlement systems.³ They arise whenever there is the possibility of a long chain of orders of interdependent trades queuing up and there are no appropriate mechanisms to cover a possible default in any one link of the chain. In an RTGS system, in which every overdraft requires to be collateralised (i.e. TARGET), such mechanisms are stronger than in a NS, where collateral only covers the largest net debit allowed (as it occurs in Euro 1) or the two largest net debits allowed (as it occurs in CHIPS).

Theoretical models of the trade-off between reducing systemic risks and the costs have been developed by Schoenmaker⁴ (1996); Angelini⁵ (1996); Freixas-Parigi⁶ (1998); and Kahn-Roberts⁷ (1998). All the models model the cost structure of NS and RTGS systems as well as the costs of delayed payments, i.e. raising the possibility of a payment gridlock.⁸

Schoenmaker argues that, from an empirical cost-benefit standpoint, the probability of a single failure to settle and a single net debit loss needs to be weighed up against the lower cost of a NS system. In a

² The definitions of gross and net settlement systems, their differences and similarities and their risk implications are described in Annex 1.

³ In RTGS systems orders may be queued and settlement postponed until the end of the day.

⁴ “A Comparison of alternative interbank settlement systems” D. Schoenmaker.

⁵ “A simple model of the interbank payment system” P. Angelini

⁶ “Contagion and efficiency in gross and net interbank payment systems” Xavier Freixas and Bruno Parigi.

⁷ “Payment system settlement and bank incentives” Charles M. Kahn and William Roberds.

similar way, the (unknown) probability of multiple (and independent) settlement failures and a multiple net debit loss needs to be contrasted with the higher cost of an RTGS system. While we know which system is more costly, we do not know which system is more cost effective given the risk and loss reduction achieved by the different settlement arrangements.

Angelini focuses on reserve management and argues that payment senders have an incentive to delay payments until later in the day when more incoming funds have been received and the need to purchase additional cover is reduced. However, the cost minimisation behaviour of payment senders creates uncertainties for payment receivers in managing their end-of-day central bank reserve positions. This can create greater variance in overnight reserve positions and a higher average holding of excess reserves which, in turn, creates information problems for short-term monetary policy and lowers banks' profits.

Freixas and Parigi identify a trade-off between gross and net settlement systems in terms of safety and efficiency. They make the assumption that a gross system is not exposed to contagion but makes intensive use of liquidity, while a net system economises on liquidity but exposes banks to contagion. A particular system will be preferred depending on the values of three model parameters. A gross payment system is preferred if the probability of banks having a low return is high, if the opportunity cost of holding reserves is low, and if the proportion of final users which have to invest / spend in another location is low. Otherwise, a net system dominates.

For Kahn and Roberts, net settlement economises on the holdings of non-interest bearing reserves, but increases moral hazard problems (e.g. the incentives to default on the debt).

1.2 Practical experience in the field of payment systems in the euro area

The pillars of the current payment system infrastructure were established by the predecessor of the ECB in September 1993,⁹ after an intense debate on the advantages and disadvantages of gross and net settlement systems. The Committee of Governors decided to promote the establishment of RTGS systems¹⁰ in all the EU countries. This would reduce systemic risk, provide real-time settlement with finality to ancillary systems, and prevent complex problems of risk control when building the large value payment system needed for Stage Three of EMU (the future TARGET). Large-value payment systems were allowed to operate in parallel with RTGS systems provided that they (a) settled at the central bank on the same day as the exchange of the payment instruments; and (b) fully complied with the Lamfalussy standards.

⁸ A payment gridlock is where no payments are made because participants are unwilling to fund further payments.

⁹ See the document entitled "Minimum common features for domestic payment systems" approved by the Committee of Governors of the central banks of the Member States of the European Economic Community.

¹⁰ In 1993 RTGS payment systems existed only in Italy, Germany, France, the Netherlands and Denmark.

From the start of Stage Three, three major net settlement systems have been competing against each other and with TARGET to attract these payments: Euro 1, Euro Access Frankfurt (EAF) and Paris Net Settlement (PNS). Other netting systems have been operating in Spain, Luxembourg and Finland but the value of payments processed in these systems is very low.

TARGET has been the preferred payment system in terms of both volume and value of transactions. In 1999, 54% of the volume of payment orders representing 69% of the total value were processed through TARGET. Moreover, traditional net settlement systems such as EAF have lost a substantial amount of their pre-EMU business with the introduction of the euro and of the TARGET system. The provision of intraday credit at no cost and the availability of a wide range of collateral for intraday credit have been a determining factor in this success.

In net settlement systems, the introduction of the euro has not yet produced a major shift of activity from one to another¹¹. Euro 1, EAF and PNS processed on average 13%, 11% and 7% respectively of the total value of payments in 1999, with a fairly stable pattern throughout the year. One possible reason for this is that systems such as EAF and PNS started out with a strong domestic base of participants. Competition forces push towards a single net settlement system which maximises the netting gains and minimises the liquidity needs of participants. However, the pressure of competition can be offset by the transfer costs of moving from one system to another. When different systems (originated in different countries/areas and therefore with a strong local component) operate in parallel and compete to expand their services to a broader area (the euro area), a sub-optimal situation may arise, in which each system improves the services provided to the local clientele (which constitutes the core part of its business), but the systems differ so much in their specifications that one system is not able to attract the participants of the other, given the high transfer costs.

The net settlement systems of the euro area seem to be moving in two directions. First, an increase in the number of retail payments. Second, a shift towards more hybrid systems which combine elements of gross and net settlement systems.

Euro 1 is increasingly being used for retail payments.¹² This is also true to a lesser extent for TARGET, but not for EAF and PNS. Several factors suggest that competition between net payment systems will concentrate on the cross-border retail business. First, there are inefficiencies inherent to the correspondent banking services through which cross-border retail payments predominantly take place nowadays. Second, there is a lack of a homogeneous interbank infrastructure for retail payments which could serve as an alternative. Last and by no means least, there are huge potential benefits, given the fact that payment

¹¹ This can only be confirmed in terms of value. In terms of volume, Euro 1 is growing at a high speed, while EAF and PNS remain stagnated.

¹² In Euro 1, the volume of orders doubled from January 1999 to December 1999, while the total value of transfers remained stable. The decline in the average payment and the increasing number of orders reflect the fact that Euro 1 is increasingly being used for retail payments. On the contrary, in EAF and PNS the amount of the average payment has remained more or less unchanged.

system fees depend on the number of orders (regardless of their value). The fact that the average payment in TARGET doubles the average payment in net settlement systems leads one to believe that large-value payments will be concentrated in TARGET, while net settlement systems specialise in retail business. This trend would be in line with the theoretical argument maintaining that when a system settles a high volume of low-value orders, the netting gains increase and the systemic risk decreases.

Net settlement systems are increasingly adopting the traditional features of gross systems. For example, EAF and SNP operate with multiple batches during the day and with no implicit credit received from the system (i.e. in order to make outgoing payments, participants can only use incoming funds or the balances they hold on the internal accounts of the system). Furthermore, the existence of two parallel systems creates a need to move liquidity from one to another on a real-time basis. Liquidity bridges/liquidity swaps between these systems and the national RTGS system must provide this possibility in a secure manner. In Germany, the RTGS system and EAF will merge to become RTGS plus, which will allow participants to choose between real-time and multiple-batch settlement using a single liquidity pool.

In sum, it can be expected from these trends that large-value payments will concentrate in TARGET, while net settlement systems will specialise in retail business. As the technical differences between gross and net payment systems tend to be blurred, it does not seem necessary to maintain two parallel systems for the same kind of payments. Therefore, merging with an RTGS system is a strategic alternative for those net settlement systems which have a strong domestic component or which do not compete in the retail business. Competition forces will push towards a more integrated infrastructure, although they are strained by the transfer costs of moving from one system to the other.

1.3 Factors that affect the gross vs. net debate in securities settlement systems

In the euro area, the debate between gross and net settlement is now taking place in the field of securities settlement systems (SSSs). However, neither the theoretical framework nor the practical experience in payment systems can be applied to the securities field without considering the following aspects:

Institutional considerations: Unlike payment systems, where there was a decision to promote the establishment of RTGS systems and create TARGET, by linking the RTGS systems, in the field of securities settlement, no precise decision has been taken with regard to the final configuration of the industry. Within this framework, there is still much debate as to whether SSSs need to be upgraded in order to provide real-time settlement for all transactions and how they should be linked to each other.

Differences between the different providers of the services: When compared with payment systems, securities settlement systems present two main differences.

First, the role of central banks is different and often less active. Specialised entities provide services in the field of custody and settlement securities (i.e. national and international central securities depositories). Only in a few cases are these entities owned or do they coincide with the central bank. This implies that in the field of securities settlement systems the process needs to be even more market-driven than in the field of payments.

Second, the role of commercial banks, acting as custodians for securities, is not the same than the role of correspondent banks for payment systems, given the concentration of the custody business on a few market players. Both custodians and correspondents hold securities/funds for a foreign participant which does not have access to the system. For consolidated systems, this role is no longer necessary, as the foreign participant gains automatic access to the system. However, the scope of the custodian's activity is even broader in terms of its capacity as (1) shareholders and managers of many SSSs (central banks assume this role in TARGET), (2) providers of internal settlement in their own accounts if they reach a "critical mass" of securities (by definition a correspondent bank cannot compete with a central bank for the provision of a critical mass of credit), and (3) providers of value-added services related to issues such as corporate action or portfolio reporting.

Peculiarities of SSSs due to the "securities leg": A securities transaction normally consists of two legs: a "securities leg" and a "cash leg"¹³. The existence of the securities leg entails the two following peculiarities.

First, delivery versus payment (DVP) mechanisms must be applied to avoid principal risk. This means that delivery occurs if, and only if, payment occurs. Settling in real time is more costly in SSSs, in the sense that settlement requires two conditions:¹⁴ (1) the seller must have an idle balance of the specific asset which is being traded, (2) and the buyer must have an idle balance of cash or sufficient collateral. This conditional settlement is also true for payment systems only when payment versus payment (PvP) is applied.¹⁵ Consequently, the probability of having to queue orders in a SSS is higher than in a payment system, because either of the prerequisites are not satisfied. In particular, the management of the securities leg is not as flexible as the management of the cash leg if an overdraft is required during the day, because securities lending mechanisms cannot provide securities as easily as a central bank can provide credit.¹⁶ *This implies that the idle balance which needs to be held on the securities side is larger than the one held on the cash side and thus the implementation of an RTGS system is more costly.*

¹³ There are also simple transfers of securities or purchases and sales of securities against securities (e.g. uncollateralised or collateralised securities lending).

¹⁴ If the two conditions are not satisfied simultaneously, the order is queued. If several orders are queued, final settlement tends to be postponed until the end of the day, as is the case in a deferred net settlement system.

¹⁵ PvP applies mostly to foreign exchange transactions, whilst unsecured money market transactions consist of a single leg.

¹⁶ Owing to the fungibility of cash and the fact that securities lending mechanisms are more recent.

Second, in the field of securities only trades made on the same underlying asset can be netted. However, the fungibility of the cash side is greater, because all orders denominated in the same currency can be netted. *Therefore, if an SSS applies net settlement, the netting gains will normally be larger on the cash side than on the securities side.* In order to increase the netting gain on the assets side, cross-product netting schemes are being implemented to extend the range of securities which can be netted.¹⁷

The settlement cycle in traded securities: For traded securities in the EU countries the settlement cycle currently varies between T + 3 and T + 5. This means that all the trades executed on day T are settled three to five days afterwards. There is a tendency to shorten the settlement cycle, because of the replacement cost risks and liquidity risks involved. However, as long as traded securities do not settle on the same day on which they are traded (T + 0), real-time settlement does not seem necessary. If all the securities which are to be settled in one day are entered into the system on previous days, only one batch a day would be enough. However, additional batches may help to solve unmatched trades and to cover any possible default.

The use of securities as collateral: Securities, which are used to collateralise an obligation and provide a guarantee to the creditor, usually need to be settled on T + 0 with intraday finality¹⁸ and therefore real-time (or at least intraday) gross settlement. This is especially true for unforeseen needs, because for foreseen needs collateral may be pre-deposited in advance. Which creditors demand collateral with intraday finality? Central banks (not only for monetary policy operations, but particularly when providing intraday credit for the smooth functioning of payment systems), clearing houses (in applying margin calls) and private financial institutions which provide collateralised credit to the money market through an intraday repo.

The eligible collateral of the Eurosystem operates like a second layer of liquidity. At any given moment in time, the counterparties of the Eurosystem must have the capacity to obtain liquidity against collateral. For this reason, the standards for the use of SSSs in ESCB credit operations have established that “SSSs used for the settlement of central bank transactions shall have facilities in place by 2002 to allow the

¹⁷ The possibilities of cross-product netting are larger in the field of derivatives than in spot markets. For derivatives, it is the exposure to an underlying asset which is actually traded; not the underlying asset as such. Thus, settlement of derivative instruments does not necessarily entail the delivery of the underlying asset; open positions may be settled by offset (a cash payment). In spot markets, the delivery of one asset cannot be substituted by the delivery of a different asset. Thus, in spot markets cross-product netting is limited to netting, for example, a repo and a direct trade over the same underlying asset.

¹⁸ In a similar way, the settlement of a securities lending operation, typically requires settlement with immediate finality.

option of intraday DVP settlement in central bank money. This may take the form of real-time gross-settlement, or a series of batch processes with intraday finality.”¹⁹

Approximately 98% of the eligible collateral of the Eurosystem are debt instruments held in a SSS. The collateral accepted by clearing houses and by the counterparty which provides financing in a repo is also composed mainly of fixed income instruments. Therefore, SSSs must provide the possibility for debt instruments to obtain DVP with intraday finality. Not only because the Eurosystem will cease to use those SSSs which do not provide this facility by 2002, but it is also being demanded from intraday repo markets and clearing houses.

The role of clearing houses: A clearing house is an institution which, by becoming a central counterparty to every trade, concentrates the counterparty risks of all participants. A broad set of measures are applied to manage these risks: margin calls, the settlement of these margin calls in central bank money, membership requirements, default procedures, limits to exposures, loss-sharing schemes, dedicated members’ funds and/or the own funds of the clearing house are set in order to limit the potential losses which could arise from the default of any counterparty.

Clearing houses reduce the counterparty risks which are inherent in a long settlement cycle, while at the same time providing two important advantages: multilateral netting and anonymity in trading.

Clearing houses provide multilateral netting almost in the same way as net payment systems do for the settlement of cash. Net payment systems like the EBA have a “single obligation structure”, whereby at any given time, each participant has only one single payment obligation or claim with respect to the community of other participants. If a participant defaults and margin calls are not sufficient, losses are shared among the community of participants. In a clearing house, the single obligation or claim is against the clearing house because of its central counterparty role. However, given that the clearing house is usually owned by its clearing members, the community of participants would also assume the losses, albeit in an indirect manner.

Anonymity in trading with no additional counterpart risk enhances market growth and integration.

By reducing the need for liquidity and assets to the minimum, clearing houses exploit the advantages of net settlement for traded securities. Simultaneously, by covering counterparty risk they reduce the pressure to shorten the settlement cycle and move towards real-time settlement of securities.

¹⁹ The Eurosystem requires eligible collateral to be settled with intraday finality because overdrafts in TARGET, as any credit from the Eurosystem, need to be collateralised. The smooth functioning of TARGET (as any RTGS system) requires these overdrafts or intraday credit facilities in order to avoid a possible gridlock in the payment system. Credit may be obtained in the money market or from the central bank. Credit institutions tend to keep tight balances, which are just enough to cover their minimum reserve requirements. Thus, intraday central bank credit is crucial. Intraday credit needs may or may not be anticipated by the counterparties. In the case of anticipated needs, counterparties may pre-deposit the collateral in advance. In the case of unanticipated needs, a counterparty may not have sufficient collateral deposited at the central bank. It is of vital

Consolidation process in progress (links between SSSs)

The need for real-time finality to link the different components of TARGET was one of the arguments that the Committee of Governors put forward in favour of RTGS in 1993. Today, the model in which the consolidation process in the field of securities takes place, conditions the gross versus net debate. A decentralised model (or link approach) requires RTGS to be efficient (as explained hereafter), while a more centralised model provides more freedom to choose between gross and net.

When two SSSs establish a link to each other, the recipient SSS should not allow redelivery of the securities until it has received them from the issuer SSS on a final basis. Where an issuer SSS fails to provide intraday finality, its links to another SSS can be a source of systemic risk. If the recipient SSS allows redelivery of securities received on a *provisional* basis from the issuer SSS, an unwinding of provisional transfers by the issuer SSS could lead to further unwindings (or debit balances in securities) in the recipient SSS. Equally, if the recipient SSS prohibits the retransfer of transferred securities before finality is achieved in the issuer SSS, the link is likely to be less efficient. If both SSSs operate a single end-of-day batch, a simple transfer through the link would take at least two days, as opposed to a domestic transfer, which would take one day. An alternative is that SSSs provide several interconnected batches during the settlement day. However, in order to settle any (domestic or cross-border) order on the same day, the number of batches would have to be higher than the number of times an asset can change hands during the trading day.

If the implementation of RTGS in each country once was a necessary precondition to create TARGET, SSSs connected with a “link approach” might need to move, if not towards RTGS, at least towards a co-ordinated set of interconnected batches throughout the day. However, in a more centralised approach this is not a necessary requirement.

It can be concluded that, for traded securities, net settlement could prevail, owing to the length of the settlement cycle and the emergence of clearing houses. However, for the settlement of fixed income instruments which serve as collateral there is a demand for SSSs to provide gross settlement with intraday finality. The consolidation process in progress need not necessarily influence the debate if a centralised approach is followed. However, in evaluating the feasibility of a decentralised approach, it must be taken into account that it will require real-time gross settlement.

importance that the SSS where the collateral is held, permits the delivery of the collateral to the central bank in a short lapse of time.

2. Consolidation in the clearing and settlement of securities

2.1 What is consolidation?

Competition forces are driving the securities clearing and settlement industry towards consolidation. Consolidation can be defined as a means to provide the euro area with an infrastructure for payment and securities settlement which is as “unitary” (i.e. neutral with regard to the location of the traders and the securities) as that of other monetary areas. A consolidated system should ensure that the settlement of any securities transaction is equally sound and cost efficient irrespective of the place where securities and users are located.

There is widespread agreement amongst market participants that the move towards consolidation is necessary, as a consequence of the creation of the euro area. Consolidation will allow the service providers of the euro area to take full advantage of the economies of scale and scope inherent in the clearing and settlement business. In turn, market participants will be able to reduce substantially their investments and operational costs. Legal harmonisation at the European level, and technological developments are also pushing towards consolidation.

The consolidation process in the euro area is moving in two directions:

- Vertical consolidation is the process by which the institutions in charge of securities trading, clearing, settlement and custody become increasingly integrated, very often through a holding company, which manages a single system for debt and stock securities, traded on the spot and derivatives markets.
- Horizontal consolidation, which has accelerated after the launch of EMU, refers to cross-border integration and co-operation between institutions providing similar services and products.

Any development in horizontal or vertical consolidation is positive for the euro area, in terms of higher efficiency and reduced operational costs. Vertical consolidation allows full advantage to be taken of economies of scope, while horizontal consolidation enhances economies of scale.

However, vertical consolidation in a way makes horizontal consolidation more difficult. To the extent that a system covers the whole trading, clearing, settlement and custody chain, its integration with another system located in a different country becomes more complicated, because the system becomes more autonomous and the technological adaptations required tend to be more costly.

2.2 Components which are affected by consolidation

Trading platforms

A trading platform can be defined as the common marketplace in which buyers and sellers agree to exchange securities, according to a set of predefined rules, and based on a certain technological platform.

Trading platforms mainly provide liquidity for the financial instruments traded in a secondary market and facilitate the completion of trades at a market price. Consolidation allows these functions to be completed in a more satisfactory manner by increasing the liquidity of financial instruments and reducing the possibility of a financial instrument being traded at the same time, at two different prices, in two different marketplaces.

In the EU, the chairmen of eight stock exchanges (the “Alliance”) signed, on 23 September 1999, an agreement to create a “virtual” cross-border market for European blue chips by November 2000.²⁰ They agreed to implement a “common market” model for the most liquid European equities. This common market model could be described as a mechanism based on a decentralised approach, which would allow users of each exchange to have access to stocks listed on the other exchanges by using the existing technology. However, the exchanges would have to upgrade their trading systems to create a web of connections between the eight stock exchanges through a single electronic interface.

Recent initiatives coming from a range of rivals have emphasised the weaknesses of this decentralised approach with different technological platforms to deliver the harmonisation required by market participants. The efficiency of the Alliance was first questioned by a group of American and Swiss banks and brokers which decided to create their own electronic platform for trading top 300 European equities.²¹ Indeed, advances in technology allow the swift migration of activity from one marketplace to another if a number of big players agree to do so. The position of traditional stock exchanges is also being challenged by electronic communication networks (ECNs) such as Tradepoint (an ECN based in London, which recently announced to include European equities to its UK equities) or Jiway (an initiative of the Swedish OM Group and Morgan Stanley to trade European and US shares).

Competitive pressure has already led three of the stock exchanges of the Alliance (Paris Bourse, Amsterdam Exchanges and Brussels Exchanges) to merge into Euronext. Euronext offers the members of these stock exchanges single membership and joint access to securities and derivatives markets. Deutsche Börse and the London Stock Exchange are currently holding negotiations that could lead to a merger.

The initiatives mentioned above are mainly focusing on equities trade. In the field of fixed income instruments there are very few initiatives taking place on the European scene. One important initiative is the emergence of Euro MTS as an inter-dealer/broker electronic platform for benchmark bonds of all the EMU participating countries. The International Securities Market Association (ISMA) has also initiated a project to set up a screen-based order driven trading platform, called Coredeal to enable its members to trade international debt securities on an anonymous basis.

²⁰ The eight stock exchanges are London, Frankfurt, Paris, Zurich, Amsterdam, Milan, Madrid and Brussels.

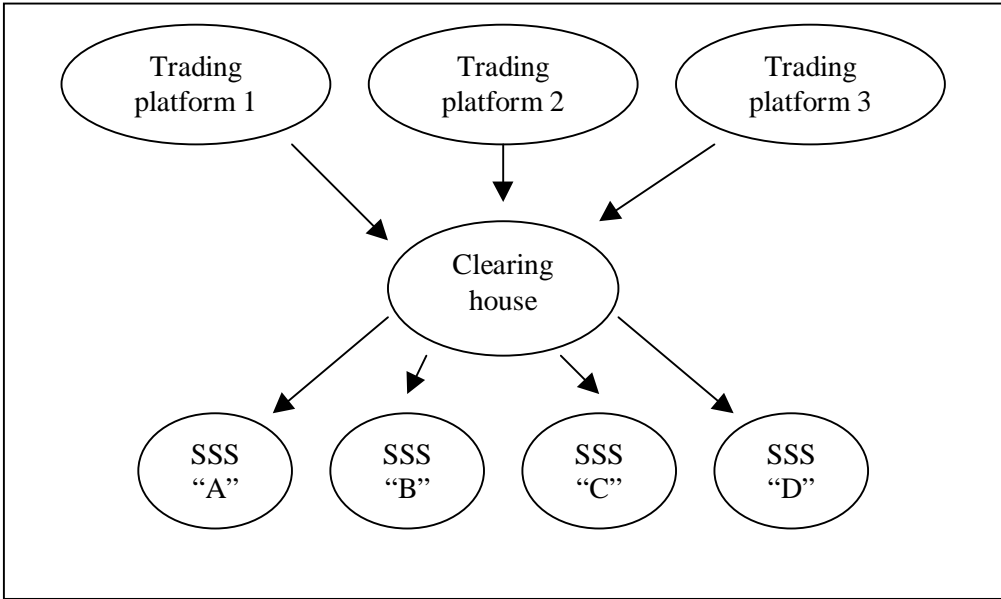
²¹ The group is composed of Goldman Sachs, Morgan Stanley Dean Witter, J.P. Morgan, Merrill Lynch and Union Bank of Switzerland.

Netting

Netting allows for a reduction in the amount of processing and in the level of exposures by offsetting a counterparty’s debits and credits and leaving a smaller obligation. The netting function may be performed by a clearing house or by the SSS. However, limiting settlement activities to only one SSS would limit the potential volumes to be offset. An efficiency argument could be made for a pan-European clearing house which would become central counterparty to all trades in the securities and derivatives markets, thus taking advantage of the economies of scale implied in the clearing business. This clearing house would be able to monitor the clearing member’s overall risk position (i.e. it would not have to rely on information-sharing agreements to have a complete picture). It would also increase the efficient use of the clearing member’s collateral, and it would reduce the number of payments/deliveries which the clearing members have to make.

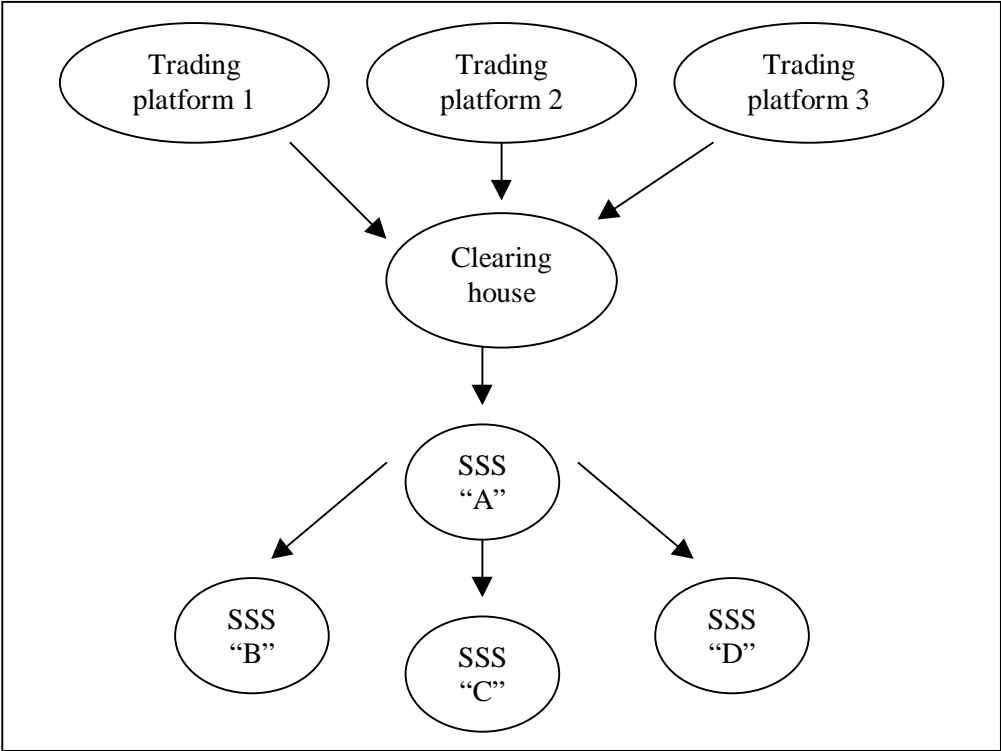
The number of clearing houses which clear securities in the EU is relatively low.²² In fact, not every country has a clearing house. The announcement of Clearnet (Paris) and the London Clearing House (LCH) to create a consolidated clearing house prove that the trend towards concentration is strong. The declared intentions of trading platforms (such as the Alliance of Stock Exchanges) to use a single central counterparty to clear all trades show that there is a demand in the market to use a central clearer for trades.

In becoming a central counterparty to every trade, a consolidated pan-European clearing house would also have to decide in which SSS it chooses to settle. One possibility is that it could connect to multiple settlement systems as shown in the diagram below.



²² Clearing houses were originated to cover the counterparty risks implicit in derivative instruments. Although most EU countries have a derivatives clearing house, not all these derivatives clearing houses clear securities.

Another possibility is that it connects to a single SSS only, which would use its links to other SSSs to settle all kinds of assets cleared by the clearing house. In this case, the other SSSs would tend to limit its activity to operations requiring real-time settlement.



The potential impact which clearing houses may have on the securities settlement infrastructure explain the interest of many SSSs in participating in the governance structure of a clearing house and in building links which would connect them to a high number of SSSs.

Securities settlement systems

Securities settlement systems (SSSs) are systems which mainly provide custody services and final delivery of securities from the seller to the buyer. Market investors use the services of SSSs in order to discharge the obligations which they assume in trading platforms.

The fragmentation of the securities settlement infrastructure before the introduction of the euro obstructed the demand to operate across European markets. In 1997 there were 23 SSSs in the 11 countries of the euro area. This was the result of differing historical, institutional, technical and legal environments as well as of the existence of different currencies.

The model which best describes how consolidation is taking place in the securities settlement infrastructure is perhaps the “hub and spokes” model.²³ This is a semi-centralised model in which the hub SSS is connected through a DVP link to each spoke SSS. The SSSs with a large base of global participants (or local participants with high cross-border business) are competing to become hubs by building links and providing new added-value facilities, in order to ensure a high level of securities concentration. It can be expected that SSSs which provide settlement to local participants (with low cross-border business) will become spokes, thus limiting their activity to local settlement and providing a range of services to the hub, such as a depository function and processes related to corporate events and cash management. When applying this model in practice, very few SSSs accept being a spoke. On the other hand, the same SSSs (or their shareholders) seem to be reluctant to invest money in order to develop new facilities which will enable them to act as a hub. Even the implementation of a full network of DVP links turned out to be too costly for many “smaller” SSSs.

Competition between the larger SSSs has so far led to three different initiatives.

Two of them follow a centralised approach. Cedelbank and DBC gave rise to *Clearstream International* on the one hand, and Euroclear and Sicovam, on the other, have opted to merge and to compete to become the European hub. Until now, however, consolidation has mainly focussed on the ownership level rather than the infrastructural and operational level. Both Clearstream and Euroclear are currently maintaining parallel infrastructures in Germany and Luxembourg, and in France and Belgium. This reflects the reluctance of SSSs, which have recently heavily invested to implement new technological platforms, to adopt solutions which would make these new platforms obsolete.

The third initiative is the Eurolink initiative, a more decentralised approach developed by the Association of European Central Securities Depositories (ECSDA). It originally envisaged the implementation of a complete network of bilateral links between all EU national and international CSDs. Such a network proved difficult to implement fully, given the high costs associated with the establishment of bilateral delivery-versus-payment (DVP) links, and the current (and expected) low use of most of these links. Therefore, the proposal has currently evolved into a “hubs and spokes model”, with only a few “hubs” implementing links with each other and with some smaller systems (the “spokes”). In principle, the “spokes” would not need to have links between each other.

The debate today is therefore how many “hubs” or “central poles” will exist – one, two, or a few. It will be the result of a market-driven process. The challenge is to strike an appropriate balance between, on the one hand, the maximisation of economies of scale and network externalities and, on the other, the need not to introduce distortion in the competition between securities settlement systems and other market

²³ The hub and spokes model was initially put forward by Euroclear. It is used here to define a conceptual model, which does not necessarily reflect the strategy followed by Euroclear.

major players. Reducing the number of hubs to one would probably increase efficiency by maximising the critical mass of securities which are settled in the hub and by allowing global participants to gain access to cross-border trades via a single gateway. Meanwhile, an adequate level of competition is positive to ensure that these efficiency gains can be perceived by the participants in terms of lower fees.

In the field of payment and securities settlement systems, this dilemma has often lead to the creation of oligopolies, as shown by the co-existence of Visa and Master Card in card payments, or of Cedel and Euroclear for the international securities clearing. In particular, the competition which has existed to date between Euroclear and Cedel has not been perceived as the fundamental obstacle to consolidation, but rather as a form of protection from the negative externalities of a monopoly. The outcome of this debate will be very heavily influenced by global custodians in their role as managers of some SSSs, as users of SSS, and as providers of services to SSSs.

Relations with payment systems

Traditionally, every country has had parallel and connected infrastructures for payments and securities. The consolidation of the securities infrastructure implies that in the medium term the number of SSSs will be lower than the number of RTGS components, because for some countries the SSSs where the domestic securities are settled will be located abroad.²⁴ Two approaches seem possible at the current juncture:

- A centralised approach in which a hub SSS has an interface with one system only.
- A decentralised approach in which a hub SSS has an interface with all the central banks of the euro area.

The principle of decentralised access to intraday liquidity in central bank money makes the first approach difficult. Liquidity management would be cumbersome for a credit institution which receives intraday liquidity in one RTGS system (the RTGS system where its central bank supplies liquidity) and settles securities in another system (the RTGS system where the SSS settles the cash leg).

In sum, a SSS which aims to become a hub in the euro area will probably have to develop interfaces with each national RTGS system in order to settle operations in central bank money. Equally, all the central banks of the euro area might have to open a securities account in the hub in order to receive collateral from their participants.

²⁴ The announcement that Irish bonds will settle in Euroclear and that the Central Bank of Ireland will be limited to a registrar function is an example. The same can be said, to the extent to which the mergers between Cedel/DBC into Clearstream and Euroclear/Sicovam consolidate into a single system.

2.3 The role of the Eurosystem

The smooth functioning of securities settlement systems is a prime concern for central banks owing to the close links which exist between these systems and payment systems, monetary policy and financial stability: In particular:

- Securities clearing and settlement systems are used to settle and to safe-keep the securities used as collateral for receiving payment systems liquidity, and payment systems are used to settle the cash leg of the securities settlement transactions. Any disturbance or malfunctioning in the settlement of securities would affect the functioning of payment systems.
- Monetary policy operations require to be adequately collateralised, using in most cases the services of SSSs. Any disturbance or malfunctioning in one system would affect the refinancing operations of the euro area's banking community by the Eurosystem.
- The potential systemic risks which are embedded in the clearing and settlement of securities are a concern for central banks in their role of preserving financial stability.

As a first step, the Eurosystem has set standards as a user of securities settlement systems, and assessed whether the SSSs of the EU meet these standards. The efforts made by the SSSs to comply with these standards shows that they have acquired de facto a regulatory value. Furthermore, SSSs which fully comply with the standards consider it a "quality stamp" and publicise it.

In this context, the Eurosystem cannot be indifferent with regards to the consolidation process presently under way in the euro area. Its attitude is guided by the principles of efficiency and of neutrality.

Efficiency implies that the Eurosystem considers that consolidation in the securities clearing and settlement infrastructure is necessary and that it will contribute to eliminate obstacles in the integration process. One first step towards consolidation is to achieve that Eurosystem's monetary policy counterparties are able to use all collateral which is eligible, irrespective of where the collateral or the counterparty is located. This is currently possible through the Correspondent Central Banking Model (CCBM). However, the benefits consolidation should not be limited to central bank operations only. This, in turn, requires a reshaping of the present infrastructure in order to allow all euro area securities to be easily transferred across Europe.

The principle of neutrality means that the Eurosystem does not favour any particular solution in order to achieve integration. The Eurosystem will not interfere with market competition between systems, financial centres or categories of banks to provide a more integrated solution. The decision concerning the most suitable model should be left to the market.

Consolidation progressed rapidly particularly in the first year of Stage Three of EMU. However, some obstacles to an integrated securities settlement industry still persist. Market participants are keen to see

further consolidation of the industry in order to save costs and, in particular, to facilitate the settlement of transactions on a cross-border level.

An important factor that will lead towards further integration and towards more neutral competition among participants is the achievement of a fully harmonised regulatory framework for the clearing and settlement of securities. The regulation and surveillance of securities clearing and settlement systems is undertaken up to now mostly at the domestic level, with little harmonisation at the EU level so far. The introduction of the euro has accelerated the expansion of clearing and settlement activities beyond national borders (either by cross-border links or by cross-border mergers) because systems have ceased to be protected from competition by currency borders.

In this context, a lack of a harmonised regulatory framework, may lead service providers to be tempted to relax risk management measures in a race to attract volumes. Since these institutions concentrate a significant amount of risk within them, mismanagement of these risks can have huge systemic implications. Furthermore, if a service as vital for the financial system as the settlement of securities is concentrated in a private, profit-oriented monopoly as a result of economies of scale, it must be guaranteed that no abuse is made of this position.

The regulation and surveillance of clearing and settlement activities is a task which central banks cannot carry out alone. It is a task which also involves other institutions, such as securities commissions and banking supervisors, because it is a subject related to the banking/securities firms sector, secondary markets and payment systems.

Appropriate mechanisms are necessary to co-ordinate the regulatory framework for the clearing and settlement of securities at the EU level. To the extent that different types of supervisors/overseers may have a different perspective or apply different regulations, the rules and conditions for the clearing and settlement of securities may differ significantly from one country to another and thus hinder an EU-wide level playing-field.

Annex 1: Theoretical background on the concepts of gross and net settlement systems and their risk implications

A gross-settlement system is defined as a transfer system in which the settlement of funds or securities transfer instructions occurs individually (on an instruction-by-instruction basis). A net settlement is that in which transfer orders are netted before settlement. Netting refers to the reduction in the amount of processing and in the level of exposures by offsetting a counterparty's debits and credits and leaving a smaller obligation. Gross-settlement systems can be designed to settle in real time; that is to settle orders at any time during the day provided that the participants have enough funds/securities in their accounts at that time of day. Net settlement systems may have an end-of-day batch or a series of batches during working hours; thus settlement is necessarily deferred. For the sake of simplicity, this note considers gross settlement systems to settle in real time (RTGS) and the settlement of net systems to be deferred.

However, netting procedures are not exclusive to net settlement systems. A clear-cut distinction between RTGS and multiple-batch net settlement systems is not always easy. In an RTGS system, if the debtor does not have enough funds/securities to settle an order with real-time finality, the order is queued. Queued orders will tend to accumulate when there is a high rotation of funds/securities and there is not enough credit to facilitate settlement. The system typically attempts to net queued orders against each other in order to reduce the size of the queue and to facilitate prompt settlement.

One important difference between RTGS and deferred-net settlement systems lies in the way credit is provided to facilitate smooth settlement. In deferred-net settlement systems, intraday credit is implicit in the system. For an RTGS system to be able to obtain finality in real time effectively, credit must be explicitly provided, because the participants are not always able to synchronise the incoming and outgoing payments/deliveries.

Who provides this credit and in what conditions? In deferred-net settlement systems, the credit is provided by participants with a credit position, unless there is a central counterparty. By replacing the original counterparties to every trade, a central counterparty accumulates all the credit risk. In RTGS payment systems, the provision of intraday credit from the central bank helps prevent such queues from building up. However, in the field of securities there is no such mechanism to facilitate the settlement of the securities leg of each trade, because securities lending mechanisms for each kind of asset traded are not always available.

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