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**THE CLEARING AND SETTLEMENT INDUSTRY
STRUCTURE, COMPETITION AND REGULATORY ISSUES**

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The Clearing and Settlement Industry Structure, Competition and Regulatory Issues

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Abstract

The structure and the development of the clearing and settlement industry have long been paid attention by national and international regulators. Given the key role of clearing and settlement for the growth, the integrity and the integration of capital markets, regulators are deeply concerned with the competition and the stability issues raised both by recent mergers involving securities markets infrastructure institutions (i.e. Central Security Depository – CSD) and by the increasingly fading distinction among intermediaries (i.e. banks acting as global custodians) and CSDs. The present study deals with these issues after focusing on the structural changes and the competitive dynamics in the industry, as well as on the regulatory initiatives already implemented or which might be carried out. The paper discusses the analogies in the competition involving global custodians and CSDs, on one hand, and issuer CSDs and investor CSDs, on the other hand. The analysis clarifies also the dynamic leading the issuer CSD to a hold a dominant position, in spite of the arrangement of links between CSDs aimed at improving the settlement of cross-border transactions. The focal conclusion stemming from the discussion is that the access to the core services provided by CSDs bears many similarities either to the access to natural monopolies in network industries or to the pricing strategies in platform industries, depending on whether a vertical view or a “getting on board both sides” view may be adopted. Under the former view, interactions between the post trading infrastructure, on one side, and issuers and intermediaries, respectively, on the other sides are separately modelled: therefore, the prescriptions of the access regulation could be regarded as a useful tool. Under the second view, the post trading infrastructure, either because of consolidation or contractual agreements with the trading structure, interacts with issuers and investors/intermediaries simultaneously: therefore, the setting of the platform industry may be appropriate. In the real world, the platform industry scheme may be referred to equities and other securities that trade mainly on exchanges and whose settlement occurs on the CSD chosen by the stock exchange (or CCP) which normally is also the issuer CSD. For securities that trade mostly on OTC markets, such as bond and government securities, given the existence of competitive pressures on the “issuer side” of the CSD business, the CSD may be considered as interacting with each side of the market separately and the access regulation may be regarded as the most suitable tool. In any case, regulation of prices should be coupled with the removal of the barriers, relating to differing legal, tax and regulatory frameworks, which prevent the development of an efficient Europe-wide clearing and settlement infrastructure (as extensively pointed out by the Giovannini reports). Moreover in order to grant the level playing field among CSDs, price regulation needs to be homogeneously implemented on an international basis, requiring therefore coordination among national regulators.

JEL Classification: G21, G28, K21

Keywords: Clearing and Settlement, CSD, Global Custodian.

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1. Introduction

The structure and the development of the clearing and settlement industry have long been paid attention by national and international regulators. Given the key role of clearing and settlement for the growth, the integrity and the integration of capital markets, regulators are deeply concerned with the competition and the stability issues raised both by recent mergers involving securities markets infrastructure institutions (i.e. Central Security Depository – CSD) and by the increasingly fading distinction among intermediaries (i.e. banks acting as global custodians) and CSDs.

The present study deals with these issues after focusing on the structural changes and the competitive dynamics in the industry, as well as on the regulatory initiatives already implemented or which might be carried out. The paper discusses the analogies in the competition involving global custodians and CSD, on one hand, and issuer CSDs and investor CSDs, on the other hand.

The analysis clarifies also the dynamic leading the issuer CSD to a hold a dominant position, in spite of the arrangement of links between CSDs aimed at improving the settlement of cross-border transactions.

The focal conclusion stemming from the discussion is that the access to the core services provided by the CSDs bears many similarities to the access to natural monopolies in the network industries and, therefore, that rationalisation of the industry might be pursued through effective access price regulation. According to this approach, regulators should design non discriminatory and homogeneous tariffs allowing investor CSDs, intermediaries and global custodians to access the network controlled by the issuer CSD. The access price regulation, however, must be coupled with the removal of the barriers, relating to differing legal, tax and regulatory frameworks, which prevent the development of an efficient Europe-wide clearing and settlement infrastructure (as extensively pointed out by the Giovannini reports). Moreover in order to grant the level playing field among CSDs, access price regulation needs to be homogeneously implemented on an international basis, requiring therefore coordination among national regulators.

The paper is organised as follows. Section 2 reviews the main characteristics of the clearing and settlement services (the so called core services) as well as those of the ancillary or non core services. The structure of the industry is also analysed in detail in order to identify the subjects (market infrastructures and intermediaries) active in the provision of post trading services as well as the main factors which may hinder competition among such subjects (Section 3). Section 4 reviews the main insights of the literature on network industries and on platform industries in order to investigate whether and how the principles of the access price regulation may be applied to the clearing and settlement industry. Section 5 concludes.

2. Clearing and Settlement Services and the Structure of the Industry

2.1 Core Services

A pre-requisite to analyse the clearing and settlement industry is a clear specification of the different phases that make up the so called value chain, that is the different functions and operations that stand between the execution of a trade and the buyer and seller having their

securities and cash accounts debited or credited. This will also help to standardise the terminology which will be used throughout the paper.

Table 1 highlights the phases of the value chain with specific reference to the domestic trades executed on a stock exchange with a central counter party (CCP).

The first step in the post-trading process is the “trade matching” which assesses the consistency of the terms of trade of the buyer with those of the seller thus preventing unintentional errors. Trades executed on electronic order books are typically pre-matched by the same trading system and then automatically forwarded to the Securities Settlement System (SSS). OTC trades – normally not assisted from the guarantee of the CCP – are sent to the SSS directly by the intermediaries and may require a “manual” control and reconciliation of the data transmitted by the two counterparts.

Table 1

The value chain in the core clearing and settlement services
(Domestic on-exchange trades)

<i>Service</i>	<i>MATCHING</i>	<i>CLEARING</i>		<i>SETTLEMENT</i>		<i>CUSTODY</i>
		<i>Novation and risk management</i>	<i>Exposure netting</i>	<i>Settlement netting</i>	<i>Settlement instructions</i>	
<i>Description</i>	Acquisition of trade data (from the intermediaries or from the market) and reconciliation of the terms of transactions.	The CCP interposes itself in every contract becoming buyer to every seller and seller to every buyer; margining and counterparty risk mitigation	Calculation of bilateral balance of each market participant against the CCP.	Calculation of multilateral cash and securities net balances.	Generation of the instructions for transferring cash and securities. Interaction with the cash payment system. Management of fails.	Record-keeping of issuers and intermediaries accounts. Management of collateral.

The second phase encompasses the clearing services and is performed by the CCP. The CCP minimizes the counterparty risk and guarantees trade anonymity becoming the “buyer to every seller and the seller to every buyer” (so called contract novation). The clearing function may extend itself to the exposure netting. Exposure netting consists in creating, for each market participant and each traded security, a bilateral net (cash and securities) balance against the CCP. This is needed for the margins calculation and for the counterparty risk management.

The CCP may then forward the bilateral balances against each trading participant to the SSS. Together with the CCP instructions, the SSS acquires settlement instructions from other sources (OTC trades or other trading platforms) and may perform a further transaction netting, generally known as settlement netting. Settlement netting consists in netting the trades of opposite sign executed by a participant vis-à-vis all other participants, including the CCP, and thus generating multilateral balances (i.e. cash and securities balances for each market participant against any other participant). This process aims at minimizing the number of trades to be settled and generates the credit/debt instructions for the “cash leg” and “securities leg” of each trade. These instructions will be used to actually credit/debit the security and cash account of market participants.

Some SSS, in order to minimize counterparty and operational risk, (*are based on*) act on the basis of the so called “delivery-versus-payment” (DVP) principle whereby the security account of the seller will not be debited until it is sure that the buyer can fulfil its obligation (and vice versa). This result may be guaranteed by moving cash and securities on transitory accounts, not usable for other settlements, or blocking them up to the moment of the final settlement.

The DVP mechanism requires strong operational interaction between the SSS and the cash payment system, which is typically managed by central banks (in this case settlement is said to occur in "central bank money"). There may be however different ways to actually manage such interaction. For example, in some countries (France and Sweden) the SSS manages both the securities and cash accounts of the intermediaries through an outsourcing agreement with national central banks.¹

The final phase of the value chain consists in the custody service, now mostly related to dematerialised securities held in a book-entry system, and performed by what is usually called a Central Security Depository or CSD (although CSDs typically manage also the securities settlement system). The term "custody" refers to a bundle of record-keeping services related to the following accounts:

- issuer account;
- intermediary account;
- customer account.²

The issuer account – maintained by the CSD in the name of the issuer – is credited for the global amount of each issue immobilised or dematerialised. The CSD that keeps the issuer account is usually called the “issuer CSD”.

The "intermediary" account – kept by the CSD in the name of the intermediary – is credited for the quantity of each financial instrument directly held in that CSD by the intermediary for its own account or for its clients’ account (omnibus account).

The "customer" account – maintained by the intermediary in the name of its client – is credited for the quantity of each financial instrument indirectly held by the client in the same CSD through that intermediary.

At regular intervals every intermediary reconciles its records with those kept by the CSD, in order to ensure the integrity of each issue and to prevent errors or frauds to the detriment of customers. The reconciliation highlights the fundamental role of the CSD in providing, at least with respect to the issuer and the intermediary, the definitive record of the legal title of the financial instruments immobilised or dematerialised in that CSD. In certain jurisdictions this role could be regarded as equivalent to a “notary function”. The “notary function” may be similar to the keeping of a public register (like a land or car registry) as the CSD certifies the authenticity and the total amount of each issue and keeps track of the balance of the accounts of the custodian banks, making sure that the number of securities on the issuer account matches with the sum of the balances of the custodian banks’ accounts.

¹ See The Use of Central Bank Money for Settling Securities Transactions, European Central Bank, May 2004.

² With reference to the securities which are not immobilised nor dematerialised, the custody consists in the physical holding and delivery of the so-called “*chartula*”. Such service can also be performed in a book-entry form, but in this case the CSD is entirely absent and the records kept by the intermediaries will not have legal effects.

The client in whose name the customer account is maintained can be either the ultimate beneficial owner or a further intermediary acting on behalf of another client. Final investors or ultimate beneficial owners keep their securities with a bank or intermediary (the so called custodian bank) which in turn sub-deposits the securities either directly with a CSD or indirectly with other custodian banks. Custodian banks may be local correspondent banks, so called local custodians (LCs), or banks with a strong international client base specialized into the provision of custody and settlement services, so called global custodians (GCs). In this latter case there is a chain of intermediaries between the CSD and the ultimate beneficial owner the securities. As it will be illustrated in Section 3, a cross-border settlement lengthens this chain whereas the spaces of competition between intermediaries and CSD become larger and the global custodians play a very important role³. In fact, intermediaries and institutional investors operating in several countries can centralize in a global custodian the holding of securities without being member of each single issuer CSD.

2.2 Non Core Services

A few services, such as such as securities and cash lending or the management of corporate actions, not tightly related to but nevertheless facilitating or, respectively, being the premise of the settlement process lengthen the value chain of the post trading industry as non core services.

Many CSDs manage securities lending facilities (SLF) aimed at smoothing the securities settlement process and preventing fails. SLF match short and long positions on the base of a previously declared availability of each intermediary to be a lender or a borrower. In general, however, CSDs are not allowed to act as a principal in securities (or short term cash) lending, except for the so called international CSD (ICSD), that hold a full banking license.

As we will discuss in the next section, in some cases custodian banks compete with CSD in the provision of core settlement services and being in a position to offer a full range of non core services gives them a competitive advantage over CSD. On the other end, if CSD were permitted to offer non core services they could exploit their market power in the core services business to cross-sell other banking services and thus exerting an unfair competition on custodian banks.

Other very important non core services regard the management of the corporate actions, such as dividend payments or rights issues, on behalf of the issuers.

The efficiency of the shareholders identification mechanism is among the prerequisites to the provision of this ancillary services. Graph 1 illustrates two different models of provision. In the first model the CSD is not involved in the data flow: every single intermediary sends the data related to the identity of the ultimate beneficial owners to the issuer which consolidates the data. In the second model, the CSD receives the data from the intermediaries, consolidates and sends the information to the issuer.

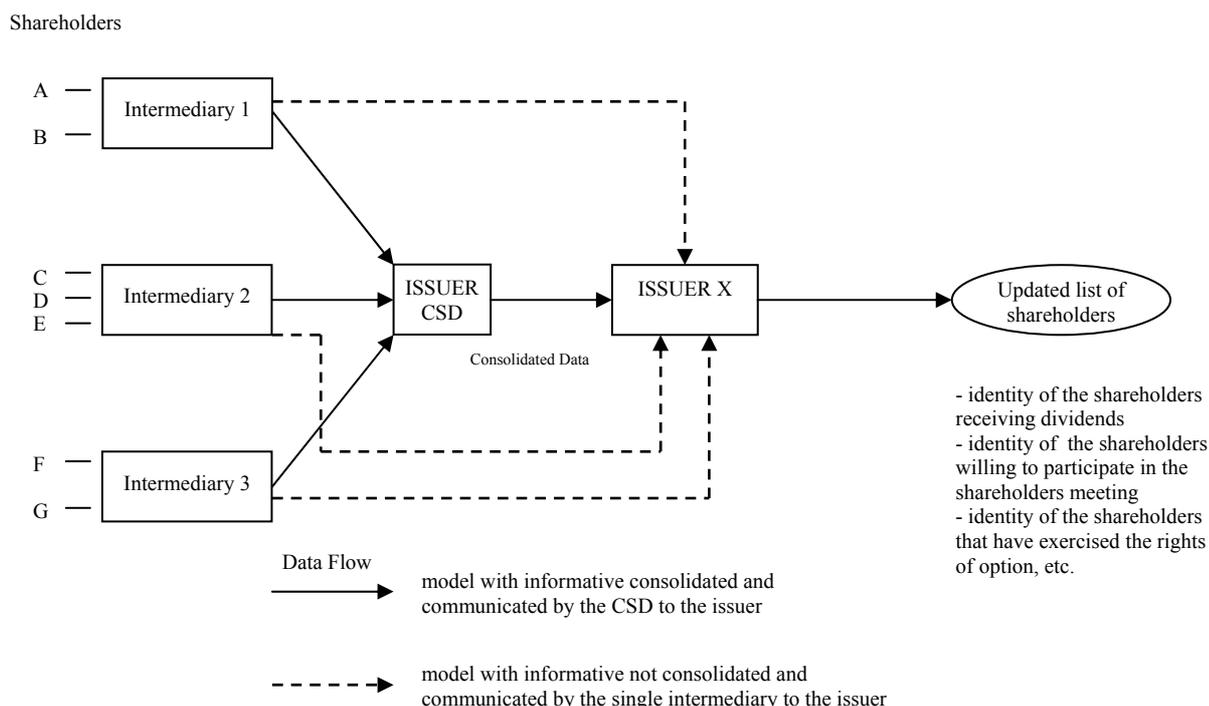
CSDs can offer other services to issuers such as proxy voting and public offerings management. One example is the procedure of electronic proxy voting offered by CREST.

³ The five greatest custodians worldwide are US banks. The major European global custodians are UBS, BNP Paribas, HSBC, SIS and Société Générale (see www.globalcustody.net).

The members of CREST and their clients can transmit to CREST the proxy vote statement in electronic format; CREST centralizes the information and sends it to the issuer in real time and electronic format.⁴ In case of takeovers and other public offerings, CSDs may inform their members on the launch and term of an offer, centralize the information on the number of shares tendered and address such information to the bidding issuer.

Graph 1

Alternative ways to vehicle shareholders identity information



2.3 The Structure of the Industry in Europe and in the US

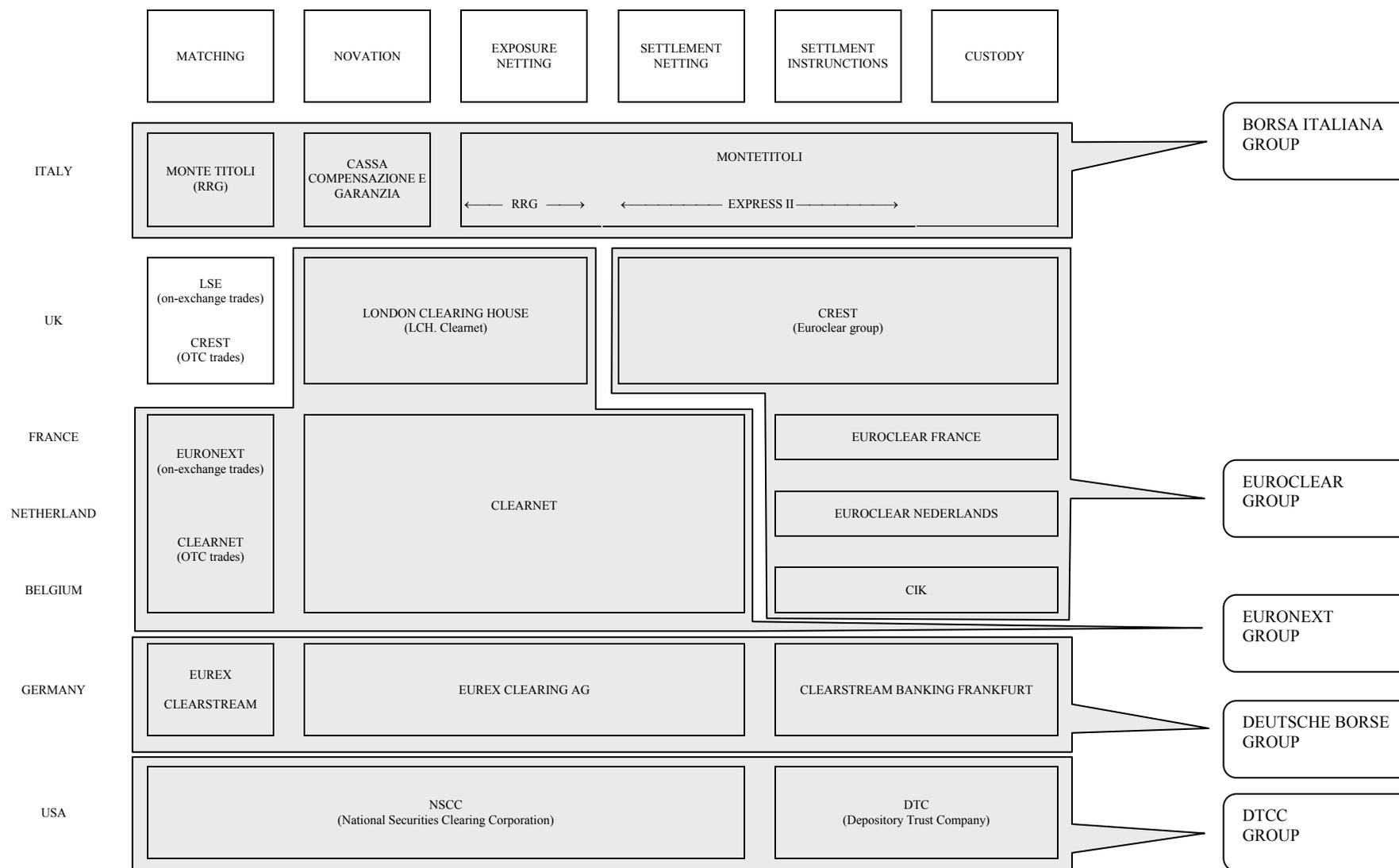
After experiencing an intense consolidation process and cross-border alliances over the past few years, the European post-trading industry currently shows a large range of organizational models and degrees of vertical integration. Graph 2 illustrates the situation in Italy, Germany, UK, France, Belgium, Holland and the US. Depending on the degree of vertical integration and on the governance structure, we can distinguish four basic models of the industry structure.

1) Full vertical integration between trading and post-trading with profit-oriented companies. This is the case of the so-called vertical “silos”, that can be found in Italy and Germany. Stock exchanges control all the phases of the value chain (clearing, settlement and custody) through the majority ownership of profit-oriented companies.

⁴ The system also allows the issuers to inform electronically all participants in CREST of the convocation of a shareholders meeting (type of the meeting, agenda, ISIN of the securities admitted to vote).

Graph 2

Structure of the clearing and settlement industry in Europe and the US



2) Horizontal integration with profit-oriented companies. This is the case of the Euroclear Group, comprising a number of companies offering services in the terminal phase of the value chain – settlement and custody – in the UK, France, Holland and Belgium. Such integration, nevertheless, has not led to the creation of a single system of settlement and custody (although the “Single Settlement System” project aimed at using a centralized computer system has been started⁵).

3) Partial vertical integration between trading and post-trading. This is the case of the Euronext Group, that integrates trading and CCP functions. Clearnet, the Euronext owned CCP, is the only European CCP offering its services to stock exchanges not belonging to the same group (Virt-x in the UK and, at least until recently, MTS in Italy). The German CCP Eurex also provides services to the Swiss Exchange but the Swiss Exchange is its main shareholder together with Deutsche Börse.

4) Vertical integration in the post-trading services with not-for-profit companies. This is the case of the US, where DTCC controls the unique CCP (NSCC) and CSD (DTC) for all of the trading systems in the US.

The heterogeneity of the organizational structures and arrangements is reflected in the diversity of pricing policies and fee structures across countries and CSDs, as shown by a recent study on the industry.⁶ Different pricing policies may include:

- bundling of the custody and settlement services (the English CREST doesn't charge a specific fee for the custody on domestic securities);
- bundling of trading and post-trading services (the Deutsche Börse Group charges a single fee for both services);
- pre-netting pricing, implying that each transaction forwarded to the system is charged (most European CCPs and CSDs act on this basis)
- post-netting pricing, implying that only transactions actually cleared are charged (DTCC and Euronext act on this basis).

Fees can also vary according to the different trading platforms served by a CCP or CSD other than to the levels of use of the system and the number of trades settled, as shown in Table 2 for the English CCP (LCH) and CSD (CREST).

⁵ The domestic companies will outsource the computer services of the settlement system to the group leader, while from a legal point of view they will be fully titular of the relationships with the system participants (Euroclear, 2003).

⁶ NERA Economic Consulting (2004).

Table 2

Clearing and settlement fees charged by the London Clearing House (LCH) and CREST to Virt-x and London Stock Exchange (LSE)

	<i>Clearing fee (LCH)</i>	<i>Settlement fee (CREST)</i>
Virt-x	20 pence/trade on the first 100.000 trades 15 pence/trade on the following 100.000 trades 10 pence/trade on following trades	5 pence/trade
LSE (SETS)	15 pence/trade on first 100.000 trades 12 pence/trade on the following trades	10 pence/trade on the first 125.000 trades 7,5 pence/trade on the following 75.000 trades 5 pence/trade on the following trades
Source : www.lch.com/services/equityclear/2004-02-04.asp .		

3. Anti-Competitive Concerns in the Post-Trading Industry

Post-trading services can be provided by different types of market players; concerns about anti-competitive barriers are therefore particularly relevant. In the following, we will review the main competition issues, with a particular emphasis on the cross-border provision of clearing and settlement services.

A cross-border transaction occurs when at least one of the two counterparties is resident in a country different from that of the issuer CSD. As shown in Graph 3, a cross-border transaction can be settled in two basic alternative ways: either through the existing links between CSDs, or through agent banks. Agent banks may be local correspondent banks, so called local custodians (LCs), or global custodian (GCs), i.e. banks with a strong international client base specialized into the provision of custody and settlement services.

We start analysing the competition among CSDs and GCs. Then we analyse the competition between CSDs operating in different countries (the issuer CSD and the non-issuer or investor CSD).

3.1 Competition among CSDs and Global Custodians

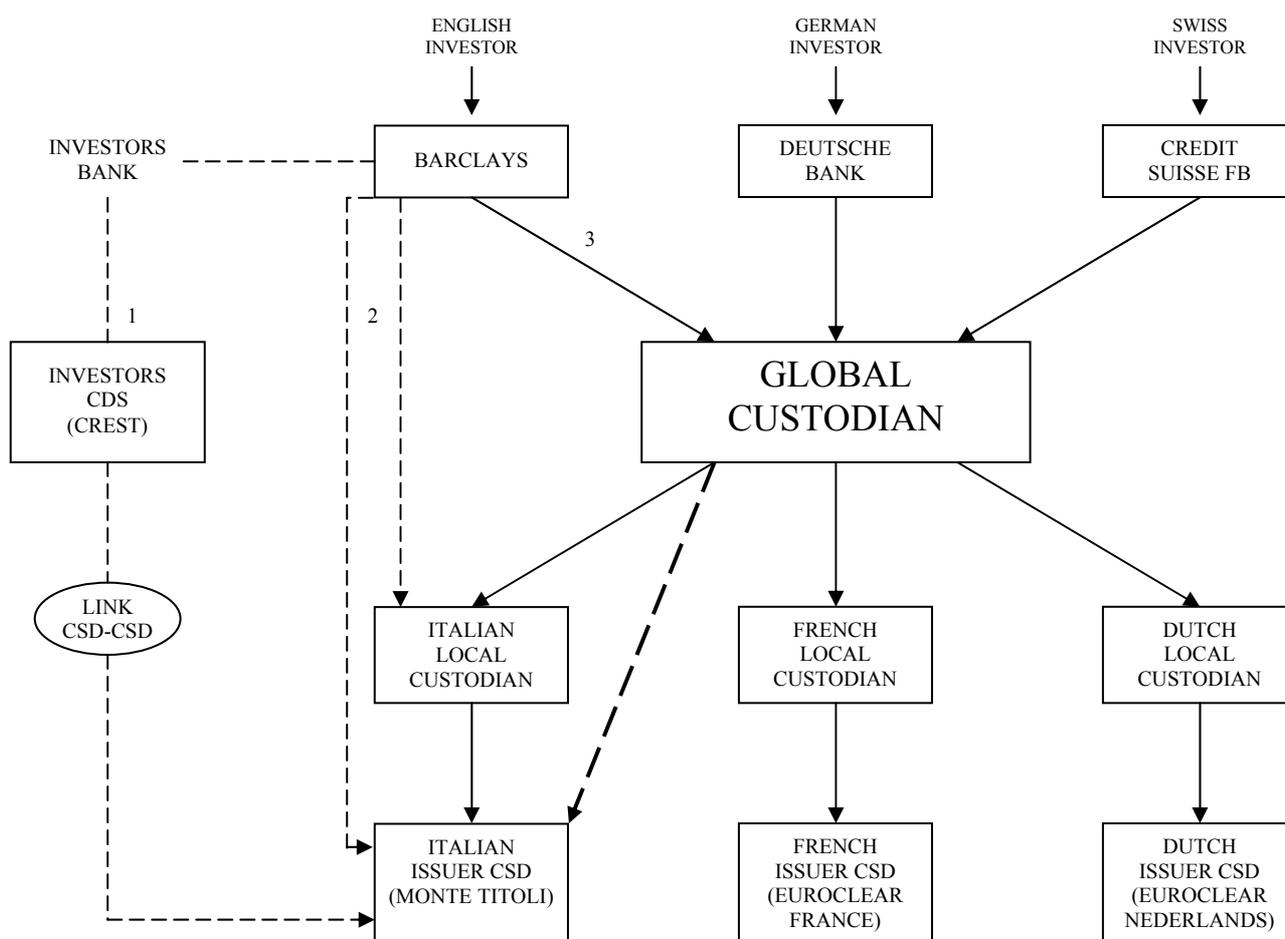
Suppose an investor residing in country A buys securities registered with the issuer CSD residing in country B and uses his investor bank (IB) as a broker. IB could become a member of the issuer CSD and settle the transaction with it (eventually keeping the securities in safe custody with the issuer CSD on behalf of its client). Alternatively, IB can settle the transaction through a local custodian, i.e. a bank residing in country B and member of the issuer CSD. Finally IB could settle via a GC: this alternative, although conceptually identical to the previous one, in fact avoids IB entering into as many relationships as many LCs IB may need to contact depending on the number of markets and countries in which its clients may want to trade (as well as acquiring the membership of as many issuer CSDs as many the markets served as a broker/trader).

As shown in Graph 3, the GC may sub-deposit the securities directly with the issuer CSD or indirectly through a LC. In any case, in order to offer its custody and settlement services, the GC has necessarily to “link” itself (directly or indirectly) to the infrastructure of the issuer CSD. In this respect, there are strong similarities with the so called bottleneck industries (i.e industries having a vertical production structure, like public utilities), with the players (competing in the downstream market) that need the access to the upstream infrastructure market, where only one firm is (and can) be active.

How can the GC undermine the issuer CSD business? As the client base of the GC becomes larger and internationally varied (i.e. as the GC’s business becomes more concentrated), the probability that the buyer and the seller in a transaction have an account with the same GC rises; this in turn implies that the percentage of transactions that may be settled internally on the books of the GC (i.e. without using the infrastructure of the issuer CSD) rises too.⁷ As argued by Holtausen and Tapking (2004), this is the fundamental reason why the issuer CSD has a strong preference to have broker or investor banks choose the LC option (or the direct membership option) rather than the GC option.

Graph 3

Alternative ways of settling a cross-border transaction



⁷ In other words, GCs face the problem which the strand of literature on platform industries names “getting both sides on board” (see Section 4). GCs have to compete to establish a two-sided market where buyers and sellers interact in a complementary way. In this stage, GCs may suffer losses which could even offset the profits earned in the mature stage of the industry.

In order to achieve this result, the issuer CSD can set the fee structure strategically so that the GC, experiencing a higher cost of using the CSD's infrastructure, is compelled to rise the price of its services, which will in turn make its services more expensive than those provided through the LC or the direct membership options.

Suppose that the CSD charges a fixed (annual) fee of 100 for each security account and 1 for each transaction settled. The total cost for settling 100 transactions will be $100+1*100=200$ and the average cost per transaction will be 2. However, the CSD could also choose a different fee structure, charging a fixed annual fee of 10 and a unit fee of 1.9. This would leave the average cost of settling 100 transactions unchanged; the average cost for a large user (such as a GC) would however be much higher (for instance, the average cost for settling 1,000 transactions would be 1.1 under the first fee structure, 1.9 under the second fee structure, that is would increase by 74%).

When the number of clients is still limited, the GC is forced to use the issuer CSD's infrastructure intensively. In the initial stage of the activity, the GC may be tempted to establish the critical customer base by charge prices below its average cost. This pricing strategy may be also due to the need to compensate investors for the switching costs that they might bear when moving from a LC to a GC (in the previous example, the GC's price equals to 1.91 – plus a small or zero margin – may not be attractive enough with respect to the LC's charge equals to 2 - plus a margin). However, if the GC succeeds in building rapidly a large client base, it can soon recover large initial losses even if initially charging average fees well below 1.91.

Consider the case in which the GC succeeds in enlarging sufficiently its market share so that it uses the issuer CSD's services to settle, for example, only 70% of the transactions. By charging an average fee of only 1.8, he would make a "gross" profit of 0.43 per transaction (for 1,000 trades settled), although such a fee would imply an average loss of 0.11 per transaction for the period in which the GC is forced to settle 100% of the trades on the issuer CSD's book. Obviously, the GC can cover some of the initial losses offering other non core or "value added" services, that domestic CSDs are usually forbidden to provide directly, and hence subsidize the core custody and settlement services with the non core banking business.

3.2 Competition between Issuer and Foreign CSDs

As previously mentioned, links between CSDs operating in different countries can be one of the two basic ways of settling cross-border transactions.

Links can be direct, when two CSDs interface with each other directly, or indirect, when the link is managed by an intermediary, such as a LC or a GC. In this latter case the link is not necessarily the outcome of an explicit agreement between the CSDs involved; actually, the issuer CSD may be unaware that a foreign CSD is using its infrastructure via the omnibus account of a LC or a GC.

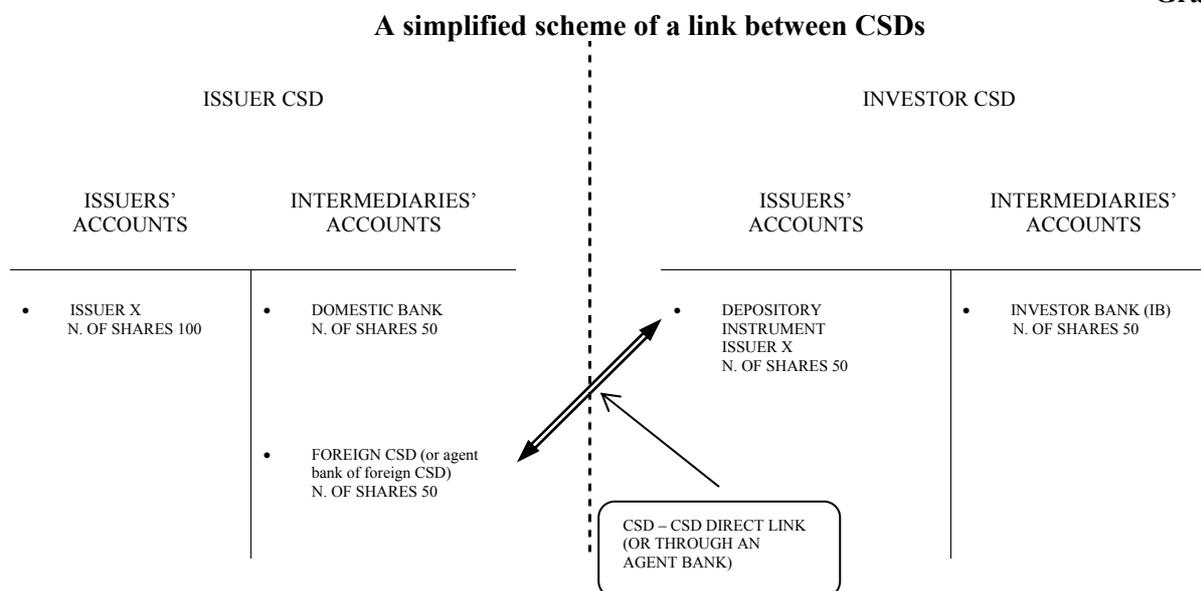
In practice, many European CSDs have direct link agreements and most of them are recognized by the ECB as a safe way of transferring securities to be used as a collateral in banks refinancing operations.⁸

Suppose now, coming back to the previous example, that the investor bank IB chooses to settle the transaction via the link between its home country CSD (of which he is a member) and the issuer CSD of country B, avoiding the use of a GC's or a LC's services.

Graph 4 illustrates the situation of the securities accounts at the two CSDs following the purchase of the shares of company X by the client of the IB. Suppose that the foreign investor bought 50 shares representing 50% of the total share capital and that the remaining 50% is owned by domestic investors via omnibus accounts of the direct members of the issuer CSD. The foreign CSD will therefore act as any other member bank, keeping an omnibus account in which he will safe-custody company X shares on behalf of its members. Hence, the role of the foreign CSD is identical to that of GC (and LC) in that it needs access to the infrastructure of the issuer CSD to provide custody and settlement services to its clients/members.

It is quite clear now why foreign CSDs can exert the same competitive pressure on the issuer CSD as that on GCs. In fact, once a foreign CSD reaches a critical mass of clients trading shares of company X, it can expect to settle an increasing number of transactions internally on its book without accessing the issuer CSD's infrastructure.

Graph 4



Thus links with foreign CSDs can expose the issuer CSD to a more intense competition on the custody and settlement business. As in the case of the competition with a GC, the issuer CSD can react by making the use of the international link particularly expensive or technically complex (and hence by increasing the indirect cost of settling via the link). By doing so, each CSD will retain a strong market power on the settlement business on those

⁸ See Standards for the use of EU securities settlement systems in ESCB credit operations, ECB, January 1998.

securities for which it has the status of “issuer CSD”, while all the cross-border business will take place through LCs or GCs (acting as agent banks).

This reasoning matches with the empirical – albeit anecdotic – evidence reported by the ECSDA according to which in Europe only 5% of the cross-border transactions is settled through CSDs’ links, while the remaining share is settled through GCs and LCs. Moreover, Deutsche Börse (2005) shows that in 2002 out of a total amount of €17.3 billions spent for post-trading services in Europe, only less than 10% went to CSDs (€1.3 billion), while the remaining 90% (€16 billions) went to agent banks and custodians.

Given the lack of reliable data, however, it is not possible to break up these figures into the share of transactions settled by LCs and GCs acting as agent or correspondent banks and the share of transactions settled internally on the books of GCs. As we suggest in the next paragraph, with respect to on-exchange trades (mostly equity trades) it is likely that GCs and foreign CSDs act merely as agent or correspondent banks, given that many stock exchanges force their members to use the default settlement system provided by the issuer CSD. As to securities traded mainly OTC (fixed income), on the other hand, it is much more likely that GCs and foreign CSDs can actually contend the settlement business to issuer CSDs.

Kauko (2003) investigates why CSDs may be interested in opening idle and expensive links. The author develops the idea that links help CSDs to credibly commit themselves to reasonable settlement fees, provided that the link itself would signal the existence of competitive pressures. If issuers are obliged to use the domestic CSD (for reasons that we will discuss in the next paragraph), charging reasonable settlement fees enables CSDs to attract investors and at the same time charge higher fees to the issuers.

Applying this line of reasoning, one may argue that the high settlement costs of cross-border trades in Europe⁹, often regarded by academics and policy makers as signalling inefficiency in the industry structure and/or distortions resulting from technical and legal barriers (as suggested in the Giovannini reports), may not in fact be in conflict with social welfare optimisation and that any regulatory intervention aiming at capping the cost of the link might in fact discourage the opening of the links, with detrimental effects for domestic investors.

One may also question whether the removal of the barriers mentioned in the Giovannini reports would drive down the price of the links. Milne (2005) argues that even if common standards ensure perfect interoperability between CSDs, nothing guarantees that these interconnections are efficiently priced. CSDs have in fact no incentive to reduce the price of the links, no matter how cheap and easy to use they become, because otherwise they would get more exposed to the competition coming from other CSDs and lose some of their monopolistic rents.

3.3 Barriers to Competition

The ability of the issuer CSDs to discriminate competitors (either foreign CSDs or GCs) through an appropriate fee structure is grounded in the lock-in effect subsequent to the choice of the issuer to immobilise or dematerialise its securities in a specific CSD. In fact, once the securities are sold on the primary market, the issuer CSD status goes together with

⁹ See, for example, Lannoo and Levin (2001) and NERA (2004).

the propensity of the banks and intermediaries that trade on that security to open the accounts on the issuer CSD itself. In other words, the barriers to competition in the notary function drive down competition in the associated settlement services.

When dealing with the barriers to competition in the notary function, it is useful to distinguish between equity and non-equity instrument issuers. In fact, such barriers are much more severe for the former than for the latter. In particular, equity issuers may be forced to choose the domestic CSD (i.e. the CSD of the country in which they are incorporated or have their registered office) either by legislative provisions, or by stock exchanges' rules or by differences across countries in fiscal, regulatory and institutional arrangements which practically enable only the issuer CSDs in the management of the corporate actions.

As to the stock exchanges' rules, it is worthy of noticing that a stock exchange may insist on the shares being immobilised or dematerialised on its preferred CSD, which is normally the CSD of the stock exchange's residence country or the CSD owned by the stock exchange (where the "silos" model prevails). Then the stock exchange typically obliges their member to use the default settlement system which is provided by the issuer CSD.

This point is emphasized by a recent study by London Economics (2004) for the European Commission (DG Competition) which finds that all EU stock exchanges (with the exception of Luxemburg) have exclusive arrangements for post trade processing of equity transactions, under which market participants have no choice but to use the clearing and settlement organization prescribed by the stock exchange. Moreover, the study finds that these exclusivity agreements do not originate from national legislation or regulation, but from stock exchanges and clearing houses membership rules.

Exclusivity agreements may result from a lock-in effect due to investments in IT by stock exchanges or CSDs. A trading platform might have made substantial software investments in order to interface with the default CSD, so that switching to another CSD would imply new IT investments. In principles, CSDs might be able to adopt an open architecture both allowing them to interface with different trading platform and stock exchanges to switch at no extra cost. This circumstance, however, would not weed out the additional back office costs that the intermediaries trading on a given stock exchange would have to bear when moving their accounts to a new CSD.

In other words, whether because of IT and back office switching costs or because of vertical ownership integration, once an exclusive agreement has been reached it seems very unlikely that the incumbent CSD will be removed, at least in the short run. This gives the incumbent CSD a substantial market power which allows the extraction of monopolistic rents to the detriment of issuers and intermediaries.

For on-exchange equity transactions there is no possibility for GCs to contend the business to issuer or "stock exchange prescribed" CSDs, because every trade will be automatically sent to the prescribed CSD, in particular in those market assisted by a central counterparty (CCP). In principle, with the exception of the silos structure case, exclusive arrangements may change over time and foreign CSDs could contend the clearing and settlement business to default/issuer CSDs. However, once the "first chosen" or incumbent CSD has also acquired the "issuer CSD" status it will probably have a competitive advantage over foreign non-issuer CSDs.

Issuers may also be “home biased” in the choice of the CSD because the domestic CSD are the only one skilled enough to manage corporate actions (dividend payment and withholding tax, information and certification to attend general shareholders meeting or for proxy voting, shareholders identification services, etc.). Such skills require an in depth knowledge of the national corporate and fiscal laws and a strong relationship with the local banking system.

As mentioned above, competition is more intense on non-equity financial instruments, such as bonds and covered warrants. This is partly due to the fact that they require more straightforward or standardized corporate actions, although for treasuries and government bonds each issuer State normally prefers to use the custody services of the national CSD. However, the home bias in the choice of the custodian for government securities may be less problematic in terms of competition. Since a large share of trading occurs OTC there is more scope for GCs and foreign CSDs to contend the settlement business to national/issuer CSD. Even for on-exchange government securities trades the mentioned study by London Economics finds that exclusive arrangements between stock exchanges and CSDs are much less frequent than for equity trades (such arrangements were found only in 6 out of 15 markets surveyed).

Summing up, the barriers to competition originate in the “issuers side” of the CSDs’ business, especially for equity securities, and are related either to listing requirements of national stock exchanges and exclusive arrangements between the stock exchanges and the CSD or to the diversity of corporate and fiscal law across countries, as outlined in the reports of the Giovanni group. These barriers create strong lock-in effects for issuers and intermediaries and give the issuer or incumbent CSD considerable market power. Once the issuer CSD has captured banks and intermediaries in the first place, it can then lock them into its infrastructure by setting fees that imply a high cost for switching to other service providers (i.e. high costs of links and fees that penalize GCs). Such market power can be less intense for the business originated by OTC/fixed income trades, where GCs and foreign CSDs have more chances to contend the market to “issuer” or “domestic” CSDs.

What implications may we draw on policy grounds?

Some authors claim that the notary function can be likened to a network monopoly and as a such asks for a regulatory intervention in the line of the access price regulation (Milne, 2002 and Section 4 for a more detailed discussion). Others point out that, although resembling an “essential facility” or a “monopolistic bottleneck” market, the notary function is in principle open to competition and as a such only policies aimed at granting access to the register of financial instruments are needed. This latter argument is grounded in the fact that there can be different CSDs keeping the public register for different security issues and a single issuer could in principle use the services of different CSDs for different types of financial instruments (e.g. one CSD for bonds, another for shares, etc.). National legislation typically require only that any single security issue is centralised on a single CSD.

The arguments supporting regulation of the CSD’s activities concerning the settlement of on-exchange trades and the notary function connected to the listing services of stock exchanges seem therefore quite strong. To this regard, the debate about the nature of the notary function does not seem relevant on practical grounds.

Hence, the design of a regulatory scheme requires first of all to distinguish between the “stock exchange originated” activity of CSDs (i.e. the settlement of on-exchange trades and

the notary function for listed issuer) from that originated by OTC trades on financial instruments for which the “notary function” is open to competition, since in this latter case need and scope of regulation may be different. Secondly, the adoption of a theoretical scheme allowing for the interaction between the different groups accessing to the CSD’s services (issuers on one side and intermediaries on the other side) may be necessary.

Consider for example the case of full competition in the issuers business segment (as it is for eurobonds or covered warrants). CSDs could charge issuers with below average/marginal cost fees in order to attract issuers and then capture the bank business more easily. Hence the “issuer business” would be the “loss leader” segment of the CSD activities while the intermediary business would be the “profit making” segment.

According to the predictions of the platform industries theory, which has recently been applied to the post trading sector, this behaviour might lead to a socially efficient relative price structure. This result however would only hold under very special conditions (concerning the demand sides and the production function); moreover, if market imperfections exist a conflict between market power and social welfare does arise.

The arguments developed so far do support the idea that market imperfections are relevant in the post trading sector and that regulation is necessary. Which scheme may be more suitable is a topic investigated in Section 4.

3.4 Regulation and Competition

The international debate on the regulation of the clearing and settlement industry has now a longstanding history, dating back to the early nineties BIS and CPSS-IOSCO initiatives, and has recently culminated with the release of a Communication by the European Commission¹⁰ and the final version of a joint document by the ECB and CESR¹¹.

While dealing extensively with the topic of risk regulation (in particular the ECB-CESR document), these documents touch upon only to a limited extent the competition problems discussed in the previous paragraphs. Competition and risk regulation are actually related, insofar as the compliance with different risk mitigation rules may impact on the costs born by different types of market players and hence interfere with a fair competition, other than duplicating rules and controls.

From this point of view, one of the key issues is whether CSDs can be allowed to offer non core banking services or even to acquire a full banking licence. To this regard, the two lobbies of the industry are obviously quite in conflict. CSDs argue that they need to be allowed to offer non core banking services in order to compete on the same ground with GCs. On the other hand, banks and GCs argue that CSDs should be strictly treated as infrastructures and should not be allowed to take on financial risks that can threaten their ability to perform their public utilities role. GCs also argue that CSDs could abuse their market power in the core business to sell non core banking services (bundling and price subsidization).

¹⁰ Clearing and Settlement in the European Union – The way forward, Communication of the European Commission to the Council and the European Parliament, April 2004.

¹¹ Standards for Securities Clearing and Settlement Systems in Europe, ECB-CESR, October 2004.

The European Commission explicitly recognized the anti-competitive concerns highlighted in the previous paragraph; nevertheless, the regulatory issues it considered remain confined to the provision of non core services by CSDs, while the topics of price regulation and removal of the barriers on the issuers' side remain largely on the background.

Another key issue is whether GCs – or “systemically relevant custodians” as the ECB-CESR documents call them – need a specific risk regulation or whether Basel II rules are enough.

Given the systemic importance of post-trading structures, the ECB-CESR standards adopt a functional perspective based on the risks related to the services provided by the various entities involved in the settlement process, notwithstanding their legal status (CSD or GC). The regulation of the services provided by CSDs and GCs is thus focused on the prevention of systemic risk and on the adjustment of the measures to the type of risks assumed. Hence, the imposition of further and more stringent risk limitation measures on GCs, other than those generally applied to credit institutions on the basis of Basel II, is not explicitly excluded.

Although the regulation of GCs and the provision of a full range of non core banking services by CSDs are of paramount importance in terms of risks and macro financial stability regulation, other key issues particularly relevant for the reduction of the barriers to competition seem to have remained down in the list of the policy agenda.

In the next Section we will discuss some regulatory tools which might be used to address the problems outlined in Section 3.3. The starting point is the comparison between two theoretical schemes which have recently been applied to the post-trading industry, that is the network economy framework and the platform industry network, as well as the acknowledgement of the analogies between the post trading industry and such schemes. A few crucial pre-conditions to any practical implementation of pricing regulation will be discussed in detail as well as the main problems which regulators might encounter in practice.

4. Competition and Pricing of the Core Services: The Insights of the Economic Theory

Competition concerns in the clearing and settlement industry led some commentators to investigate whether and how policy makers can regulate the fees set by CSDs both to issuer and to competing firms (i.e. other CSDs and GCs). Such a regulation would imply a regulation of: *i*) the terms of access to the issuer CSD network for global custodians; *ii*) the fees for the use of the links between CSDs; *iii*) the prices of the notary function applied by CSDs to issuers.

On theoretical grounds, this question may be investigated by referring to two frameworks: the natural monopolies in network industries and the platform industries. The former applies to a monopolist controlling an upstream network (for instance, local telephone lines) and also supplying goods (telephone calls) whose production requires access to the network in a downstream competitive market. In such a case, the monopolist may use the terms of access to the network to penalise competitors.

The second scheme applies to network industries providing services to two kinds of customers who need to interact: for instance, a credit card company needs both buyers who use the card and sellers who accept it. This framework puts together the theory on network industries with the multiproduct monopolist literature¹²: in particular, from the former it draws the idea that there are non-internalised externalities among the users of the platform; from the latter it gets the idea that price structures are less likely to be distorted than price levels by the market power.¹³

In the following, the main insights of both these frameworks will be mentioned, as well as the analogies which may be drawn between such frameworks and the clearing and settlement industry. As it will be pointed out later on, the choice of the reference framework depends crucially on whether the industry may be regarded as a standard vertical industry, interacting on a one-by-one basis with each category of “end users” (issuers and investors/intermediaries, respectively), or as a platform industry, getting on board both sides of the market (i.e issuers and investors/intermediaries). This in turn may depend on the degree of vertical integration between trading and post trading activities, due either to the governance/ownership structure or to contractual arrangements.

4.1 The Regulation of Network Industries

The main characteristics of the network industries are four.¹⁴ First, complementarity of the products that consumers look for: in other words, consumers buy systems (e.g. computers and softwares) rather than single goods and within a given system products must be compatible. Producers face, therefore, a coordination problem which may impact also on potential antitrust issues.

Second, there are consumption externalities in so far the utility of consumption depends on the number of individuals using similar or compatible goods.

Third, several costs (contractual, training and learning, data conversion, search and loyalty costs) lock-in consumers once they choose to use a specific system; this affects price competition among firms.¹⁵

Fourth, production is characterised by significant economies of scale in the upstream network activity, which is used as an input for the production of a good in a downstream activity (the so called *upstream bottleneck input*). Therefore, there co-exist a natural monopolistic market (the network) and a competitive market (the downstream activity; see Graph 5).

As an example, in the telecommunications the upstream market (M1) might be the local telephone links supplied by the single operator M, while the potentially competitive downstream market (M2) is that for international phone calls. The incumbent M can abuse its position through the terms of access to the network for firms in M2. Regulation of the market structure may impact on such terms of access (the so called access price or one way access regulation).

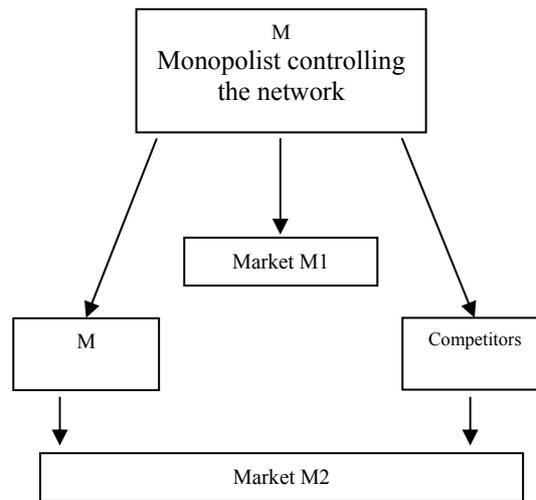
¹² For the regulation of the natural monopolies and of the multiproduct monopolies see, for all, Laffont and Tirole (1993).

¹³ See Rochet and Tirole (2004).

¹⁴ See Liebowitz and Margolis (2003); Shy (2001).

¹⁵ See Shapiro and Varian (1999).

Graph 5



Source: Armstrong et al. (1994).

Alternatively, we may have network rivalry when both the incumbent service provider M and the potential competitors control a network activity. Interconnection is necessary to ensure that customers of one network are able to communicate with customers of other networks. In the telecommunications, for instance, this includes interconnection between a mobile network and a wireline network serving overlapping geographic areas, or interconnection between a local network and a long distance network. Regulation of the market structure focuses, in this case, on the interconnection prices (interconnection pricing or two ways access regulation).¹⁶

Milne (2002) draws several analogies between the clearing and settlement industry and the network industry. First, there are externalities in consumption, given that investors prefer the infrastructures settling a high number of transactions because of a netting efficiency effect. Second, switching costs and the lock-in effect are significant especially for the notary function of dematerialised securities. Economies of scales and of scopes are significant too for the notary function, which is a natural monopoly activity, but not for the clearing and settlement functions (particularly for cross border transactions), which are the potentially competitive activity. This is confirmed by a recent empirical study showing, for a sample of settlement institutions across 16 different countries (Canada, USA, 2 Asiatic countries and 12 European countries), that doubling settlement operations leads to a rise in costs ranging on average from 53 to 70%, while doubling notary activities leads on average to an increase in costs by 18%¹⁷.

¹⁶ For a brief surveys on one way and two ways access regulation see Vogelsang (2004).

¹⁷ See Schmiedel et al. (2002). The interpretation of these results, however, need to be cautious. The top-down approach applied by the authors estimates the institutions cost functions using highly aggregated data, i.e. cost and operating income per transaction collected also from annual balance sheets and income statement reports. This methodology has a major drawback in the fact that it does not account for differences in providers reflecting differences in the bundle of services supplied, or in the accounting treatment across jurisdictions; another issue relates to the treatment of netting (i.e. whether the number of transactions is counted on a net or gross basis; for a detailed discussion see Nera, 2004).

Besides being a network industry, the settlement activity may be also described as a platform industry given that it needs both investors and issuers.¹⁸

Given these analogies, the main concern for a regulator is that by using their natural monopoly over the notary function, issuer CSDs can gain competitive advantages in settlement services and make the access to their network very costly for potential competitors (i.e. GCs and investor CSDs), as argued in Section 3. In particular, competition among CSDs and GCs may be analysed as a one way access problem, given that the issuer CSD controls the network and is in a dominant position. This is done in par. 4.1.1. Competition among CSDs may be represented, on the other hand, as a competition among network monopolists who are geographically independent. Interconnection is therefore the critical issue which may be suitable dealt within the framework known as two ways access regulation. This is done in par. 4.1.2.

4.1.1 The Access Price Regulation

In order to answer to the network access problem, the regulator has to define first of all the organizational structure (i.e. integration versus separation, hierarchy versus markets). If the monopolist is allowed to vertical integration, the access problem is internalized and, of course, the regulator may focus only on the control of the final good provided in the potentially competitive sector.

The access price issue rises under vertical separation with deregulation of the potentially competitive activities and vertical integration with deregulation. In the first case, M can operate only into the natural monopoly market M1 but not into the deregulated sector M2: this latter may be accessed only by the competitive firms using the monopolist's network as an input. In this setting, the regulator specifies the pricing of the access and of the good provided by the monopolist into M1.¹⁹

The alternative, i.e. vertical integration with deregulation, allows firm M into the deregulated sector and hence to operate both into M1 and M2 (Fig. 6). In these circumstances, the regulator may require accounting separation in order to identify the monopolist's accounts for its operations in the two sectors and to collect information necessary to set the access price as well as the price of the final goods.

In general, the regulator faces a more difficult task with vertical integration, given that potential competitors into M2 and the firm M are not symmetrically placed: the latter may in fact penalise the rivals accessing the network by applying a cost raising strategy.²⁰ Moreover, if there is deregulation of the competitive sector, the nature of competition between firms as well as the degree of homogeneity of the final product need to be considered.²¹

¹⁸ See Kauko (2002) and (2005).

¹⁹ This solution, while preventing the incentives and the opportunity for anticompetitive behaviour by the monopolist, may not satisfy productive efficiency if there are economies of scope between the (monopolistic) upstream and the (potentially competitive) downstream activities.

²⁰ With reference to the post trading industry, the issuer CSD relies on a cost raising strategy when setting high interconnecting prices to global custodians or investor CSDs willing to settle transactions on securities deposited with the issuer CSD. See the example in Houlthausen and Tapking, cited at par. 3.1.

²¹ Another relevant aspect is the impact of the access charge on the dimension of the network and on the network externalities between users.

Very briefly, depending on the organizational structure chosen and on the characteristics of the downstream market, the regulated access pricing can be classified as follows.

A) With vertical separation and perfect competition in the downstream market, the price of the final product is efficient and does not need to be regulated²²; the optimal access charge is equal to the marginal cost of access. This is the first best solution which, as it is well known, entails the monopolist making a loss. The regulator must therefore move to a second best solution by setting an access price which maximises the overall welfare subject to the firm's break even constraint (average cost pricing rule). When final goods are not homogenous (but still perfect competition applies to the downstream market), the optimal (second best) access charge is defined according to the Ramsey rule. This rule, however, is not easily enforceable given that it requires the regulator to know accurately consumer demands as well as firms' cost functions.²³

If there is a Cournot competition in the downstream market, the access charge must be set in order to offset price-costs markups in the competitive sector: in particular, the access could well be priced below its marginal cost. This solution, however, may not be optimal when one considers that regulation, by affecting the number of firms in the competitive sector, may favour excessive entry and productive inefficiencies (to the extent that it allows duplication of fixed costs). Under certain conditions, hence, the optimal access price should be higher than the marginal access cost.

B) With vertical integration, the monopolist can easily discriminate new entrants through the pricing of access. The regulator might fix both the access and the final product prices by applying, in principle, the marginal cost rule or the Ramsey rule. Alternatively, given the already mentioned difficulties which prevent the application of such rules, the regulator might enforce the pricing policy known as *efficient component pricing rule* (ECPR).²⁴ This rule says that the access charge must be set equal to the incremental cost to the incumbent of providing the access including any opportunity cost in term of lost profits.²⁵

In practice, access pricing is complicated by several factors. Asymmetric information may require the regulator to raise the optimal access price, with respect to the benchmark case of symmetric information, in order to curb the monopolist's informational rents (i.e. to induce the firm to reveal cost and demand conditions as well as its level of effort). Moreover,

²² In particular, the price of the final product is the sum of the unitary network access charge and its marginal production cost.

²³ As it is well known, when consumer demands are independent (i.e. there are no cross-price effects) the rule implies that prices should be closet to marginal costs in markets where demand is more sensitive to price. If the downstream market is perfectly competitive, downstream firms act as intermediaries between the monopolist controlling the network and the consumers of the final goods. Therefore, the firms providing goods to consumers with very price-elastic demands must be charged higher access prices than the firms serving consumers with low price-elastic demands.

²⁴ This rule is due to Baumol and Willig. As an instance of such a rule, assume that all firms supply homogeneous products and the monopolist loses one unit of sales for each unit of access supplied to rivals. If the regulator fixes the final product price at P , the optimal access price is P net of the monopolist's unit cost in the competitive activity. With P fixed, the access price has no impact on allocative efficiency and the access charge may be set at the level granting productive efficiency (in fact, potential competitors will enter only if they are more efficient than the incumbent).

²⁵ The ECPR is a form of marginal cost pricing, where the cost includes also the lost profits of the incumbent. This rule allows is geared only to productive efficiency and may impair both allocative and distributional efficiency if the final product price is not optimally set. Moreover, under certain conditions the rule may allow the incumbent the extraction of rents. For a detailed discussion on the ECPR see, among the others, Economides and White (1995).

imperfect competition in the downstream sector may entail departures from the marginal cost pricing of access in order to prevent productive inefficiencies due to duplication of fixed costs, triggered by free entry, or distributional losses, triggered by anti-competitive behaviours. Finally, dynamic issues must be taken into account given that access charges impact on firms' investment decisions and hence on the innovation of process and product.²⁶

Among the papers applying the theory of the access price to the post trading industry, Rochet (2005) claims the need for regulation as a tool which may be employed to prevent the undesirable welfare effects due to vertical integration between a CSD and a custodian bank. The industry structure considered is the same illustrated in Graph 6: there is a unique CSD servicing two competing custodian banks and a large number of investors. CSD offer both depository and settlement services, while banks offer banking services (custody, account management, securities lending etc). The theoretical framework is the Hotelling model, allowing different degrees of differentiation of the services provided by the banks and hence different degrees of competition in the downstream market (recall that the higher the differentiation, the less competitive the downstream market).

The main conclusion of the study may be stated as follows: while implying possible efficiency gains (i.e. cost savings and technological improvements), vertical integration may have undesirable welfare effects. In particular, it may lead to the exclusion of the competing bank, with a consequent decrease in competition in the downstream market, as well as to changes in the fee structure resulting in the penalisation of one of the category of the final users.²⁷ Regulation of the integrated CSD is therefore beneficial and may be based on the combination of the obligation to enforce accounting and governance separation between the CSD and the banking subsidiary with the obligation to grant open access to the competing custodian bank, at a price fixed by the regulator.

4.1.2 The Two Ways Access Price Regulation

The problem of the two ways access arise in more mature industries where the incumbent faces competitors who have already developed their own networks, so that mutual access is needed in order to serve all the consumers using the networks.

CSDs, as already said, may be thought as competing networks interacting on a symmetric basis, that is as geographically separated but interconnected monopolists (if links do exist). In this setting, the policy question is whether and how interconnecting charges should be regulated.

To tackle this question, the regulator has to investigate first of all whether network monopolists can spontaneously come to an agreement and whether such an agreement may penalize potential competitors and/or the consumers of the final product. On one hand, by leading to the growth of each monopolist's market shares, interconnection should incentive towards non discriminatory agreements. On the other hand, by leading to mutual competition, interconnection might provide incentives towards anti-competitive behaviour. This issue is

²⁶ These topics have long been debated in the literature which generally acknowledges that, in practice, the access charge is often assigned too many objectives (which should rather be pursued through a combination of tools).

²⁷ Given the model employed, Rochet finds out that the fees charged after vertical integration favour those characterised by a large volume of trading (i.e. brokers and dealers) and penalise those characterised by a small volume of trading (i.e. retail investors).

especially relevant if firms supply a homogeneous product to the same group of customers and are not symmetric: the biggest monopolist will probably set a penalizing access charge to the smaller rival.

Contrary to the above mentioned theoretical result, in the post trading industry it may be the case that the bigger the investor CSD the stronger its incentive to create a link. A big CSD is normally located in a core financial centre and supported by a large client base of banks with strong international focus. Hence, the gains for the big CSD (in terms of more transactions settled as “investor CSD”) will probably outweigh the losses (in terms of less transactions settled as “issuer CSD”).

On the other hand, symmetric network monopolists might collude when setting interconnecting prices. For example, they may agree on very high interconnecting charges, thus *de facto* forcing each member of the trust to set high prices also on the final good market (preventing therefore competition).²⁸

As for the post trading industry, high interconnecting charges might be thought either as resulting from a trust among symmetric CSD or as following from a defensive strategy enforced by smaller CSDs to embank competitive pressures by bigger CSDs (as argued in par. 3.2).

The theoretical prescription, enforced also by many regulators of network economies, is to apply the reciprocity principle according to which access charges must be equal across networks for all the firms. In practice, this measure may not work properly: it may be baffled by monopolists either through discriminatory non-price measures or, in case of symmetric firms, through a cartel. To prevent this, theorists suggest to set a cap to the interconnecting charges by using the ECPR policy (depending on the framework, such a cap might be either the marginal or the average interconnecting cost).

4.2 The Platform Industries

The literature reviewed so far could be adopted as a useful reference scheme by the regulator dealing with the post trading industry under a vertical view of the industry itself. A market infrastructure organised as a silo, that is vertically integrating trading and post-trading activities, may instead be regarded as a platform where issuers and intermediaries/investors interact in a complementary relationship. It is therefore useful to check whether the theoretical framework of competition in two-sided markets (or platform competition) may provide insights in the understanding of the pricing policies applied by the CSDs (both to competitors and to final users).²⁹

A preliminary question concerns the definition of a two-sided market. As recalled above, such markets exhibit two sided network effect, given that the higher the number of members/transactions carried out on the platform, the higher the benefits of joining the platform itself. The pricing structure chosen by the platform tends to increase the number of

²⁸ As an instance, let us consider the telecoms industry: if a firm increases its market share by lowering the price applied to its costumers, outgoing calls will be more than incoming calls. This in turn will imply higher interconnecting expenditures.

²⁹ For a survey on the literature on competition in two-sided markets, see Armstrong (2004). Rochet and Tirole (2001) argue that many network industries may be treated as platform industries, involving two types of customers each of them interested in the services offered by the company only if it can interact with the other.

potential customers on both sides and, to this aim, may lead to charge more one segment (profit making side) and less the other (loss leader side). This does not necessarily hold in all two-sided markets: in some cases, alternatives to an imbalanced price structures are applied.³⁰ Rochet and Tirole (2004) state a further, more rigorous, definition recalling that for a market to be regarded as two-sided it must be that the volume of transactions realised on the platform is sensitive not also to the aggregate price but also to its allocation between the buyer and the seller (i.e. price structure matters). On the other hand, a market is one-sided when costs can be passed through thus leaving quantity unchanged: the classic example is indirect transaction where it is economically irrelevant who actually bears the tax.³¹

Are the aggregate and the relative prices set by a platform optimal from a social point of view? Rochet and Tirole (2004) use a formal general model to answer to this question. The authors assume that the platform charges its users both access and usage fees and for each side i define a “per-interaction price” as a function of these fees, the fixed costs per member i incurred by the platform and the number of members of the other side j . The total price is the sum of the prices allocated to each side (i and j). The demand functions of the members of each sides depend on the “per-interaction prices” (i.e. on the fees applied to both users, on the costs and the number of users).

The total price results from the standard monopoly model and, therefore, exhibits the standard welfare properties: as such, it may require regulation (for instance, capping).³² As the price structure, platform firms tend to treat one side as a profit centre and the other side as a loss leader or as financially neutral. According to Rochet and Tirole (2005), such structure is not however socially inefficient.³³

As a practical example, let us refer to Rochet and Tirole (2003) model on the credit cards markets. In this framework, one side of the market is the retailers and the other side the consumers; the platform is the payment system. As the price structure, customers are usually the loss leaders while retailers are the profit making segment. Under restrictive assumptions, (regarding among the other things the absence of externalities and symmetric information) the price structure is optimal; the price level may however be too high. In particular, in the benchmark case of a single platform, with no fixed access costs and with a linear price structure, charges to the two groups are too high.

In the case of competing platforms with competitive markets, platforms do not make large profits overall if both sides of the market join a single platform (or “single-home”). As in the benchmark case, profits made on one side of the market are used to attract agents from

³⁰ This is the case, for instance, of corporate bonds markets, where the viability of the platform is granted by the willingness of the dealers to hold inventories rather than by offering prices benefiting one side over the other (Evans, 2002).

³¹ Costs may not be passed through because of asymmetric information, transaction costs preventing bargaining, price structures with fixed components such as subscription fees, etc.

³² The platform’s problem is the maximisation of the profit function under the constraint that the sum of the prices equals a given total price. It can be shown that, under the assumptions that transactions are linearly priced and that the profit depends on the product of the demand functions, the total price is determined according to the usual Lerner formula (i.e. it exceeds the marginal cost by a factor which is the inverse of the elasticity of volume to total price). It follows that the optimal price structure has individual prices directly proportional to the price elasticity of the corresponding demand.

³³ As discussed in the following, with respect to the price structure standard conclusions about the impact of competition or the provision of bundled services do not necessarily apply: competition among platforms may lead to an inefficient price structure; bundling may instead result in desirable relative prices.

the other side. The larger the external benefits which one group brings to the other or the more competitive the group, the more aggressively it will be targeted.³⁴

As the impact of competition on prices, Chakravorty and Roson (2004) argue that it is beneficial since it may lower their level in both sub-markets, thus raising consumer welfare³⁵; however, according to Rochet and Tirole (2005) the impact on the price structure does not necessarily lead to an optimal outcome. This ambiguity also holds when one side of the market can access a single platform while the other accesses each platform to reach all agents on the other side (or “multi-homes”). Competition lowers the price level for both sides but this does not necessarily translates into an efficient price structure.³⁶ In general, factors such as platform and customer differentiation may determine the market side which may gain more from competition.

On policy grounds, the main implication drawn from this strand of literature is that the standard antitrust methodologies used to test the occurrence of market power and to define price regulation may not be appropriate (Evans, 2002; Roson, 2004). First, each side cannot be regarded as a sub-market in isolation: in other words, a price above marginal or average cost may descend from the need to involve both sides. Second, caution is necessary in the evaluation of other aspects, such as the so called interchange fees, that is the fee that a platform pays to another platform.³⁷ This fee, according to this framework, is not designed to cover transaction costs but rather to get the right balance of prices in the two sub-markets: regulatory initiatives aimed at reducing the fee to the cost level may be counterproductive, given its potentially negative impact on the relative prices charged to the platform users.

As the post trading industry, a few papers use the platform competition scheme to describe the pricing strategy applied to issuers and intermediaries. Kauko (2002) sets up a duopolistic model, with two national CSDs, which offers useful insights on the conditions determining which side of the market (issuers or intermediaries) benefits from the price structure. To this extent, the presence of links between CSDs is crucial.

If issuers can freely choose the CSD³⁸, but investors are obliged to hold their securities in an account with the national CSD, because no mutual link connects the CSDs, issuers become the loss leader segment while the settlement service is charged at a monopoly price. If links are opened, CSDs have to compete to attract first of all investors, who can access either the issuer CSD or the investor CSD’s platform: in this case, investors would become the loss leader segment.

³⁴ For instance, if one group gains little from the interaction with the other group that it will need a special incentive to join the platform.

³⁵ As typical in monopolistic competition models, the impact of competition must be evaluated by taking into account also the benefits due to a single platform standardization, which by allowing a wider customer base on both sides may increase agents’ utility.

³⁶ Armstrong (2004) cites the examples of newspapers and advertising. If people read a single newspaper, this latter has a monopoly power over delivering adverts to its readers and can therefore extract rents from advertisers (who bear inefficient prices). These rents are then used to attract readers.

³⁷ An example is the interchange fee in credit card networks, where the credit card is used by the cardholder buying an item by a merchant, and the interchange fee is paid by the merchant’s bank to the cardholder’s bank.

³⁸ As recalled above, this hypothesis although not valid for equity issuers is quite realistic for bonds and covered warrants issuers.

5. Conclusions

The assessment of the need and of the tools of regulation in the post trading industry requires a preliminary choice of the theoretical framework and of the methodologies which the regulator may want to apply.

A first issue concerns whether the market can be regarded as a standard vertical industry or a platform industry. The vertical view would consider separately the interaction between the post trading infrastructure, on one side, and issuers and intermediaries, respectively, on the other side. Under this view the prescriptions of the access regulation could be regarded as a useful tool. The second view would model the interaction of the post-trading infrastructure with both sides simultaneously. Applying the theory on platform industries, regulators should focus both on absolute and relative prices applied to both sides of the market, and take into account that the need to get on board both sides may condition also other dimensions of the pricing policies and of the services provided by the post-trading structures (such as the links for cross-border transactions).

Whether the market infrastructure interacts with the two categories of end users (i.e. issuers and investors/intermediaries) on a one-by-one basis or simultaneously depends on the degree of vertical integration between trading and post trading activities, due either to the governance/ownership structure or to contractual arrangements.

For equities and other securities that trade mainly on exchanges, settlement occurs on the CSD chosen by the stock exchange (or CCP) which is normally the same CSD that issuers are forced to choose in order to get their securities listed. In this circumstance, the market infrastructure may be seen as a platform; therefore, resorting to the principles of the platform industry theory to understand the pricing strategy as well as the impact of competition among platforms may be appropriate. As extensively discussed above, given that the default CSD has *de facto* full monopoly power over issuers and intermediaries (GCs and investor CSDs have no possibility to exert any competitive pressure at all), it can be reasonably assumed that (as predicted by the theory), the absolute price levels are too high and require regulation; on the other hand, the design of the optimal relative prices is open to investigation, as well as of the access prices charged by the issuer CSD to competitors.

For securities that trade mostly on OTC markets, such as bond and government securities, *ex ante* there could be full competition on the “issuer side” of the CSD business (anyway, once the issuer has chosen a specific CSD, this latter acquires a substantial market power, although GCs and investor CSDs may have more chances to contend the settlement business to the issuer CSD than in the equity case). In this case, the CSD may be regarded as interacting with each side of the market separately. Therefore, when analysing the CSD’s pricing strategies, the regulator might resort to the principles of the access regulation.

A crucial pre-condition to any practical implementation of pricing regulation is, however, the harmonisation of legal and technical standards, in order to remove the current barriers to cross-border securities settlement which have been extensively pointed out by the reports of the Giovannini group. The regulator does not need to establish common standards, but rather to ensure that each competitor grants rivals access to its platform via open industry standards (such as the initiative known as Global straight through processing or GSTP).

At the same time international coordination is needed in order to ensure reciprocity and homogeneity of domestic policies, as well as a level playing field among CSDs. If this were not the case, the regulated CSDs would be forced to grant access to competitors and might lose market shares.

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