# COMPETITION AND THE ORGANISATION OF THE CLEARING AND SETTLEMENT INDUSTRY

**by**

**PROF. DR. P. VAN CAYSEELE**

**Chair**
**Department of Economics, K.U.Leuven**

**and**

**Raad voor de Mededinging**

° The viewpoints explained in this paper are those of the author and do not necessarily reflect those of the Belgian Competition Authority (Raad voor de Mededinging), nor those of any actor in the industry. Comments by D. Heremans have been appreciated greatly. Remaining errors are the author's own responsibility.

# 1. INTRODUCTION

Recently, many position papers regarding the Clearing and Settlement industry (C&S-industry) have been published, see for example the European Financial Services (2003), European Commission (2002), Group of Thirty (2003) and The Giovannini Group (2003), to name only a few. This outspoken interest for this particular industry is more than probably dictated by the concern that European Capital Markets should integrate at a really fast pace now that the Euro has realised. Obstacles, such as substantial costs in processing the clearing and settlement of international trades in securities should then be removed as fast as possible to achieve this purpose.

The costs for completing a trade are given by the fees charged by particular players to deliver certain services. These fees in turn depend on the real costs necessary to perform the operation as well as the mark ups taken. And both the expenditures necessary to perform C&S operations as well as the mark ups taken depend on the organisation of industry, because vertical integration and horizontal concentration both affect the way operations are executed and the number of rivals that will be active, see also Tapking and Yang (2004). Therefore, in the realm of an increased interest in antitrust issues and a renewed drive to regulate economic activity, the C&S-industry has not remained outside the turmoil and blueprint configurations such as the "spaghetti", "hub and spokes" or "hourglass" models have been discussed at length, see Van Cauwenberge (2003) for a survey.

Such an interest regarding an industry important for the integration of the European financial market place only can be welcomed. But in that industry, players sometimes having opposite, sometimes having similar interests, interact continuously and try to make the appropriate decisions for the future. And decision makers in politics wonder whether they need to take action or not. In order to clarify the issues at stake and to shed light on possible solutions, it would help if the economic concepts introduced in the debate were used in their proper context. And also it would help if it is well understood what can be expected from particular market organisations, regulation, … and what not.

Therefore, the use of concepts like" the public interest", "essential facility", "abuse of dominant position", … can be misguiding if taken out of the proper context. Each of the aforementioned terms, as well as others, have a clear and pronounced link to economic analysis and when they are used in a colloquial way, it becomes unclear whether the

conclusions, and especially the policy implications reached within the context of the underlying economic models, carry full weight in the present industry. Also it creates the impression that simple straightforward solutions can be implemented to remedy particular shortcomings that could arise. Such conclusions, reached "by analogy", extending solutions implemented in other sectors, could well be very misleading, as known from modern industrial organisation theory, see e.g. Tirole (1988).

The present paper takes a closer look at some of the arguments underlying the use of some of these concepts and tests them by checking reality against the exact meaning of the terms. Quite often, deliberately or involuntary, they are abused in the political discussion surrounding the future development of the C&S-industry. A companion paper, see Van Cayseele (2004), investigates some of the arguments in further detail, indicating how some conclusions can be reached in a formal and rigorous way. It also takes into account that the recent developments in the "economics of two-sided markets", see Rochet and Tirole (2003) or Armstrong (2004) might provide extremely useful insights for this industry.

More in particular then, the present paper first sketches the reasons why particular issues emerge in this industry. The next section (section 2) thus starts by explaining what an economically optimal outcome for this sector would be. The following section (section 3) indicates why it will be hard to reach it ever in the C&S-industry. Hence, trade-offs will need to be made and we point out what the advantages and disadvantages of some generic market organisations are. The disadvantages, besides cost inefficiencies and disincentives to innovate, could include the possible exploitation of market power. Therefore the next sections address some potential antitrust issues that come about. More in particular, the fourth section considers potential antitrust action in a static setting. In a fifth section, a few arguments from the political economy scene are discussed, and a final and sixth section offers some conclusions.

## 2. WHAT WOULD BE AN ECONOMICALLY OPTIMAL OUTCOME?

If possible, any industry should:

- produce in an efficient way (technical efficiency)
- charge competitive prices (allocative efficiency)
- innovate to a sufficient degree (dynamic efficiency).

While it is already difficult to combine the second and third objective in many industries, see Van Cayseele (1998), it is hard to even combine the first and the second objective in industries characterised by strong scale economies that induce the industry to consolidate into a very concentrated structure. The trade-off then indeed is between competitive prices with a fragmented industry structure that does not succeed in fully exploiting scale and scope economies, versus a concentrated industry structure with the possibility of monopoly pricing.

In the next section, we will indicate what factors precisely drive the C&S-industry into strong scale economies. For the moment, it is sufficient to note that in the standard setting of partial equilibrium analysis which always underlies the competitive analysis of a particular industry, the objective is to maximise the sum of consumer surplus, see Shy (1995), Tirole (1988), … and many others. Consumer surplus is defined as the difference between the willingness to pay for the settlement of a trade by an investor and what he actually needs to pay. Producer surplus is defined as profits for the players in the C&S-industry. (In the case of a user – owned enterprise, profits return to other players in the industry, otherwise to dispersed shareholders).

In addition to the criteria discussed above, some industries are characterised by the fact that they generate externalities onto others. Pollution of the environment by heavy industries is one example. Systemic risks which could entail a breakdown of the financial system is another. The latter typically is associated with banking activities that transform risk and shift it to different parties. While dealing with externalities has received much attention by economists, and particular solutions tend to be generally accepted nowadays, the same cannot be said regarding systemic risk. In this context, it is worth noting how professor J. Stiglitz, a laureate of the Noble Prize in Economics and the Chairman of the Council of Economic Advisers for four years, clearly favours a market solution (with tradable permits), in the case of pollution, see Stiglitz (1997). But he is less outspoken in

favour of a market outcome in the case of systemic risks, see Stiglitz (1999). Indeed, while dealing with individual risk is well understood, both how it should be handled and how financial markets actually take care of it, it is not clear how the market could or would allocate systemic risks.

Therefore, whether clearing and settlement entails particular forms of systemic risk, and then how to cope with them, is a study on its own. We will limit the discussion in the present paper therefore to the “usual” welfare criterion.

## 3. SECOND BEST OUTCOMES

Economists call an industry outcome that satisfies the criteria discussed in the beginning of the previous section "a first best outcome". By the first theorem of welfare economics, it is well known that the market structure called perfect competition leads to a first best outcome. Without going into detail, it is easy to understand why. Profit maximising firms in a competitive industry will maximise the sum of consumer and producer surplus, since the profit motivation in the firm will certainly lead to technical efficiency (producers must choose the optimal input combinations). Further, competition among them will lead to marginal cost pricing and hence to allocative efficiency, achieving the goal of realising the largest consumer surplus that can economically be justified.

But as indicated already, strong scale economies can prevent that outcome to realise. In the C&S-industry, it is well known that strong scale economies exist because of among other things, positive network externalities. At the same time, the C&S-industry typically involves banking activities. Banks are to a very pronounced extent multiproduct companies, and compete both in input and output markets. For a detailed analysis of this "double sided" competition, see the entire literature on market microstructure, e.g. Spulber (1999).

This statement certainly holds for the C&S-industry where different activities are performed, such as:

- safekeeping
- clearing and settlement

and

- asset servicing[1].

From a theoretical viewpoint, it can be shown that when securities are kept centrally within a CSD (Central Securities Depository), important cost gains can be realised. Again without entering into full detail, consider a situation where security holdings are spread over many depositories. Then each investor or his bank would need to keep an account in each and every of the depositories. For otherwise he could not trade in all securities.

[1] Sometimes a functional classification of the activities is performed. The "notary" function, the "settlement" function and the "asset servicing" function then are distinguished. Still others argue that there are "core" activities next to "value added" activities. The last distinction is not at all a clear one and there is no agreement on whether core activities constitute the notary and settlement function, or only the former.

Extending this argument to the environment of a pan-European capital market, with investors in one country being interested in deals in securities listed and kept in other countries, it would imply that a pan-European (I)CSD is the most efficient outcome from a cost perspective. But as will be shown by counterexamples, see box 1, this does not necessarily imply that one should go for a public utility type of monopoly, nor even that a regulated private monopoly is the only conceivable outcome.

Similar arguments can be made regarding clearing and settlement activities. More in particular, the larger the available pool of liquidity, the more attractive a particular trading, clearing or settlement platform tends to be. Seemingly, this results from a lower possibility of breakdowns in the process of settlement, which improves the quality of the system, i.e. increases a component of vertical product differentiation, see Van Cayseele (2004). Authors in favour of a pan-European monopoly for the holding of securities therefore claim that scale and scope economics in clearing are only exhausted at the level of one single Central Counter Party (CCP). Through this CCP, all global stock exchange transactions in Europe should be routed, see e.g. Niels, Barnes and van Dijk (2003).

***Box 1: The Economics of Value Safekeeping***

*A variety of objects in which households and firms in the economy can use to invest in, exist. They all have in common that it is essential to properly establish the rightful owner. Equally important is to trade in these objects when at a later date, their value has to be returned into cash. It is essential to do this in an efficient way, so as to minimize the transaction costs in the related markets. This implies that potentially fraudulent behaviour is minimized, while it is clear at the same time that the seller is the rightful owner, that the object is not emburdened by serving as collateral, that the rents it generates accrue to the new owner a.s.o.*

*The safekeeping, settling and asset servicing of securities in this respect is not different from real estate, diamonds, vessels, jewellery a.s.o. It therefore is interesting to briefly describe the market organisations that have evolved in industries that perform the safekeeping, settlement and asset servicing in those industries.*

*A very dispersed picture emerges when this exercise is performed. For real estate, most European countries have a public organised register that keeps track of the current identity of the owner. While the owners are identified directly in this register, only particular agents, notaries, are allowed to enter operations in this register. They establish whether the seller is the rightful owner, whether the real estate is not used as collateral, as well as a variety of asset servicing activities that have to do with redistribution of rents and taxes that go with the property.*

*These notaries certainly are many in number and compete, especially after territorial restrictions recently have been abolished. Entry barriers in the form of restrictions on the establishment of new notary offices exist but again these have been liberalized recently in many countries. Certainly the entire value chain in this industry is neither a public nor a private (but regulated) monopoly.*

*In the shipping industry as well as in the diamond industry, this trend toward monopoly does exist. For ships, the register kept by Lloyd's of London, constitutes an important source of ownership identity. Closely linked to this register are the insurance services provided by Lloyds. These involve*

*the location of the vessel determining the fee when particular areas are crossed, the nature of the freight, a.s.o. All these functions are bundled within a private player, who is cooperatively owned.*

*Similar facts emerge in the diamond industry where De Beers keeps a track record of production and primary market sales. Although subject to antitrust scrutiny in several countries, De Beers is neither a public nor a privately regulated monopoly. Related to the diamond industry is jewellery and expensive watches. More in the retail segment of the industry, these producers nonetheless keep a track record of production. Here the safekeeping function is linked to and bundled with other services like warranty policies as well as fighting forgery. The last motivation is one of the driving forces why (I)CSD's have been created: fighting counter fit.*

*This short discussion clearly indicates that although there are good reasons to exploit scale economies and bringing together all safekeeping within one and the same player, this does not necessarily imply a market structure that is characterised by public monopoly. Also, in many cases, servicing activities are closely linked to safekeeping. One of the major differences with the C&S-industry is that in this case we are confronted with a chain of holders and that ownership rights can be at different levels of the chain, also varying from one country to another.*

In addition they claim that the effectiveness of competition that normally should result from the co-existence of multiple CCP's is nil, because of their links to a particular Stock Exchange. The same holds according to this view for the competition that results from having multiple CSD's. When the choice of listing the stock on a particular Stock Exchange determines the single CSD that once and for all will hold the securities, it is also hard to imagine that securities will move between CSD's and hence the issuer CSD has a monopoly position on safekeeping of those securities, although it co-exists with other CSD's in other countries. Economically speaking one could argue that when securities are within a particular CSD issuers are locked in because of important switching costs, see Klemperer (1987).

Therefore those in favour of a pan-European monopoly claim that scale and scope economies should be exploited maximally by consolidation into a single clearing and settlement system in Europe. This could be modelled according to the DTCC, the US counterpart that already exists for 3 decades and outperforms the aggregation of the European systems in terms of cost as measured by revenues. The creation of a pan-European monopoly in clearing and settling then would establish a player with substantial market power. Hence it should be regulated so as to make sure that prices are kept in line with costs. And therefore a new regulatory agency that monitors the pan-European CSD should be erected. We will refer to this solution as the ***regulated outcome***.

Several objections can be made against this line of arguments. First, although it is true that the theoretical arguments rule in favour of a pronounced consolidation, the fact whether or not safekeeping, clearing and settlement are a natural monopoly, is an empirical issue. Hence we will have to look into the estimates of cost functions for CSD's. Second, since a

few decades, economists have argued that when the market fails to achieve a first best outcome, the regulated alternative is not necessarily the second best outcome. Whether a regulated outcome will outperform an unregulated one will depend on the severity of government failures. Or market failures and government failures should be put in balance before one can come to a conclusion. And finally, for the specific case of market failures induced by strong economies of scale, economic analysis has come up with an alternative, the so called contestable market outcome. We now will discuss each of these arguments in more detail.

***Strong economies of scale and natural monopoly***

As a first approach, some authors e.g. Lannoo and Levin (2001) or Niels, Barnes and van Dijk (2003) looked at income per transaction. It seems that annual income per transaction declines in the number of transactions. Concluding from this that strong economies of scale are present is dangerous for a variety of reasons. First of all, income per transaction is not the same as cost per transaction. As long as we do not know that the DTCC follows, or is induced to follow a pricing rule based on marginal costs, we cannot conclude that costs decline in the volume of transactions cleared daily. On the contrary, many other explanations such as learning economies, improved technologies or regulatory squeezes can explain the same phenomenon. Second, the bundle of services provided by DTCC as compared to European CSD's might be quite different. Particular telecommunication facilities for example are quite different across the Atlantic and so might it be with clearing and settling.

More sophisticated studies however seem to confirm the finding of scale economies. Schmiedel, Malkamäki and Tarkka (2002) have estimated a trans-log cost function, see box 2. Their findings indicate that indeed the most efficient settlement system is the centralised US system, which they claim can be used as a cost saving benchmark. The study at the same time indicates that for the European CSD's, economies of scale are not exhausted at current output levels. Hence one could create larger entities.

***Box 2: Translog Cost Functions***

*Translog cost functions nowadays are the best practice tool to establish whether or not economics of scale (increasing output lowers average costs) and economies of scope (bundling activities together in one operation) exist. Translog cost functions have been estimated many times to investigate whether financial intermediaries should consolidate further or not. And also whether they should engage both in balance and off-balance activities. A survey can be found in Kolari and Zarkoohi (1987).*

*Multiproduct cost functions however are sensitive tools. A few outlier observations can lead to non-robust estimates, see Swank (1996). Therefore the raw data have to be handled with care, and a good understanding of the underlying economics of the production process is important.*

*In the case of the C&S-industry, the most sophisticated study has been conducted by Schmiedel, Malkamäki and Tarkka (2002). Their findings are most interesting. In particular, scale economics tend to be exhausted before the overall size of a pan-European market would be covered, in terms of the daily number of transactions settled. Interaction terms between the two output dimensions, viz. the number of transactions settled and the historical value of the assets which are kept safe are not included in their study. If such a variable or any other measure of safekeeping output was included, and the coefficient was negative, this would indicate the existence of economies of scope. If that is the case, the separation of the core business of safekeeping from the settlement activity implies efficiency losses. Unfortunately, the authors only have included a simple output dimension in their regression analysis.*

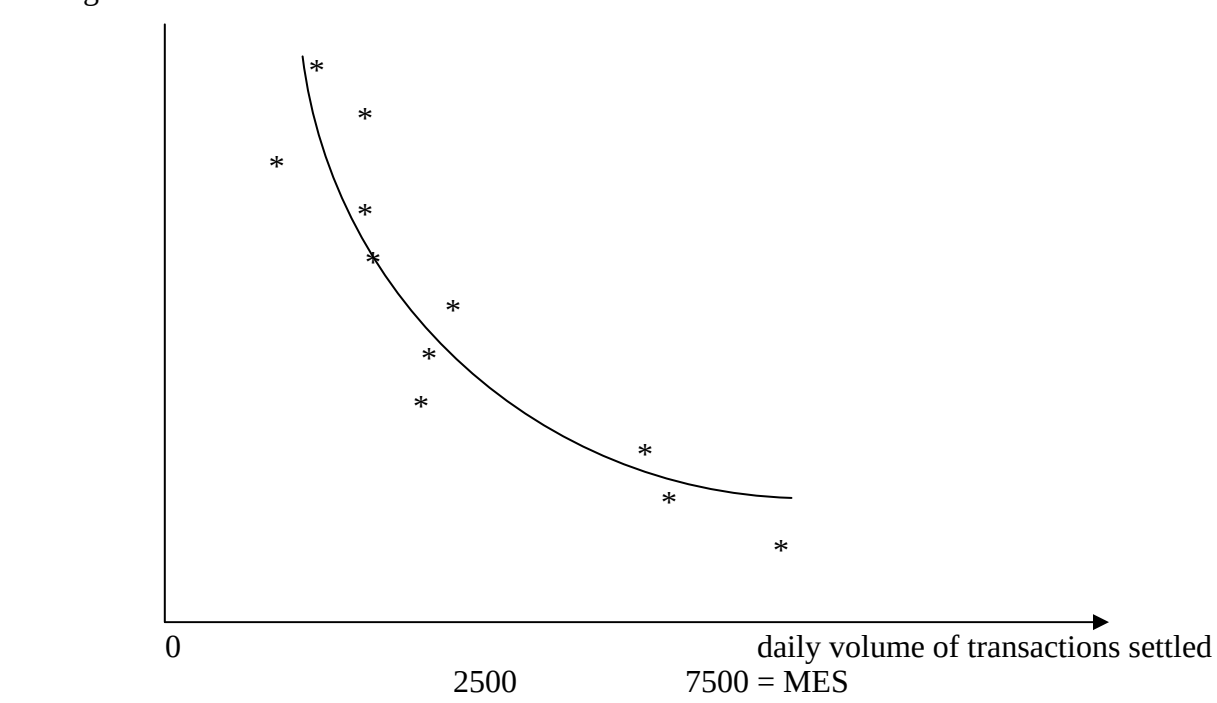
*Therefore, Van Cayseele and Wuyts (2004) looked at a panel of (I)CSD's. The results tend to replicate those by Schniedel et al. on a panel dataset. Economies of scale probably are exhausted with a minimum efficient scale (MES) well below the overall size of a pan-European market. In addition, interaction terms of the different output variables now indicate the presence of scope economies. The work by Schmiedel et al uses GDP to control for unit wage and capital costs, while the econometric exercise discussed here uses actual wage bill expenditures and capital depreciation. Nonetheless similar results follow.*

*Other remarkable findings that are confirmed involve the decline of total costs in some output ranges. In order to explain for this, a more detailed investigation of the production process should be carried out. For the moment, one reasonable explanation could be the interaction of more important volumes of safekeeping triggering less failures in settlement hence decreasing the cost of this activity. So whereas the cost of safekeeping remains the same even if the value of the depot increases by billions of euro, at the same time the increased liquidity improves the efficiency of settling tremendously, even if the number of transactions increase. In brief, the decline of costs when an increase in the number of net settlements is observed could be explained by the joint increase of depot value and number of transactions settled. If this is the case, scope economies will be extremely strong, pointing to substantial welfare losses resulting from unbundling safekeeping and settlement.*

The important question however is: how far should one go in consolidating CSD's in order to exhaust ***most*** of the scale economies? If at one third of the size of the transactions settled by DTCC, a European CSD nearly reaches the same cost as DTCC in the US, an alternative outcome that preserves competition and avoids regulatory interference is conceivable. To illustrate this further, consider figure 1 below. On the horizontal axis, the daily volume of transactions settled is represented. On the vertical axis, the average cost per operation is given. Dots denote fictitious observations, for a graphical representation on a logarithmic scale of the true data used in the empirical study by Schmiedel, Malkamäki and Tarkka (2002), see figure 1 on page 19 in their paper. Further, MES denotes the Minimum Efficient Scale, this is the point where average costs reach their minimum. Finally, two cost curves consistent with the data are drawn, one in the top and one in the bottom panel.

***Figure 1: Cost functions for settlement activities***

*Panel a) MES = 7500*




*Panel b) MES = 2500*

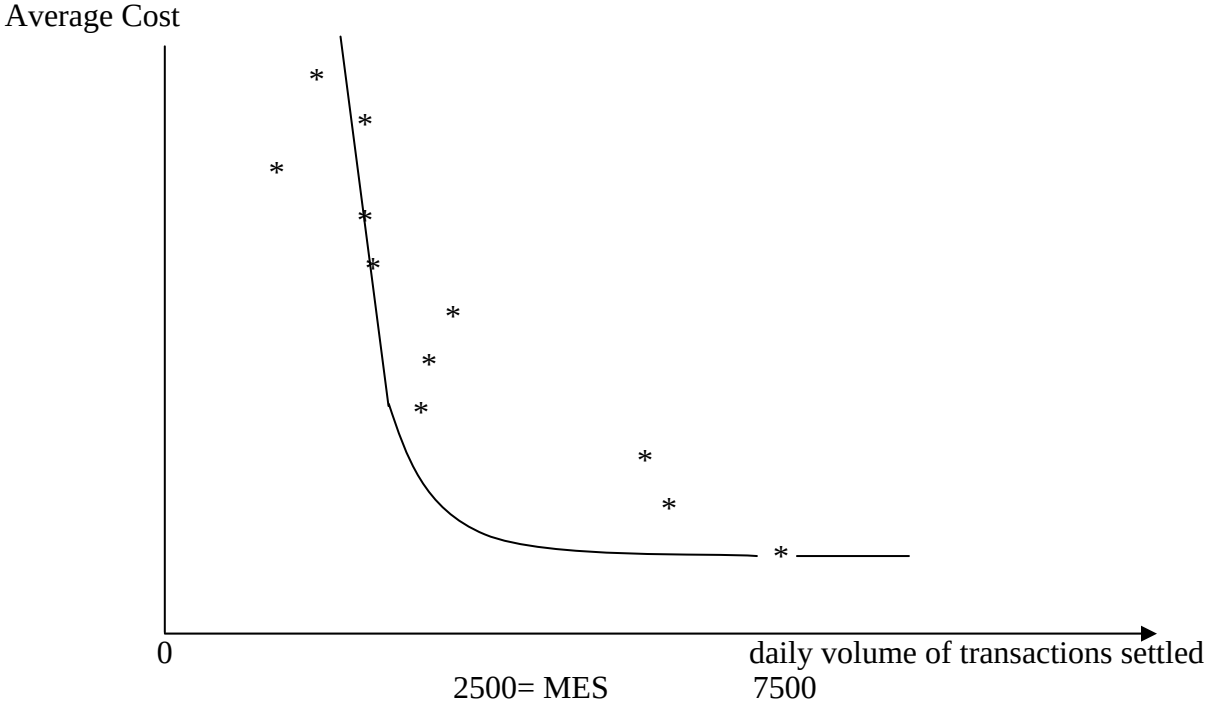


Figure 1 clearly indicates how with the current state of our knowledge, two possible outcomes are conceivable. In the top panel, it is clear that consolidation should go as far as possible. Cost efficiency is highest at substantial levels of settled transactions. In the bottom panel however, scale economies are exhausted at lower levels of output, ***allowing for the co-existence of several players that run a cost efficient operation***. Indeed, suppose the daily number of transactions would go to 5 million operations a day in Europe, and a MES equal to 2,5 million, then a duopoly becomes a sustainable market configuration.

Whenever the latter outcome is possible, there is no need for regulation in such industry. Competition between the (I)CSD's and agent banks will lead to welfare optimal prices if certain conditions (e.g. sufficient capacity) are satisfied. This is a serious advantage since it will become clear in the next section that regulation also has its problems. The central question of course is whether or not the slope of the average cost curve is best represented by the figure in the top or bottom panel.

For the moment, the observations in the relevant area are sparse. This also becomes clear from the "gap" in the representation of the data used in the regressions of Schmiedel, Malkamäki and Tarkka (2002). More in particular, in figure 2 on page 19 of their paper, it shows how once the log of the value of securities is between 29 and 31, no actual observations exist. Since a panel of observations of several (I)CSD's over time is used, probably all observations exceeding a value of 31 originate from the US system. In any case, their study shows strong potential for scale economies by expanding the operation of the European players, while at the same time less pronounced scale economies for the US system. This pattern is not inconsistent with the lower panel of figure 1 and hence it is worthwhile to retain the so-called "contestable quasi monopolies" outcome advanced by Serifsoy and Weiss (2003).

In this industry configuration, a few (I)CSD's and agent banks co-exist in the European economy. While they might have very strong positions in one or even a few countries taken together, they prevent each other from over-charging for services given to investors. For too high prices would attract the other (I)CSD. This requires that there are no barriers to entry and therefore that there is open access between (I)CSD's. If workable, such a configuration has the important advantage that it does not require regulation. Antitrust authorities that watch over the erection of e.g. barriers to entry or collusive agreements between the operators is a sufficient condition for the system to attain the static first best outcome. Moreover, it includes strong incentives for innovation and hence it is also dynamically very performing, see again Serifsoy and Weiss (2003) for further details.

Finally, it does not encounter the serious disadvantages of regulation that are documented next.

***Regulation and government failure***

Regulating economic activity faces important challenges. Since they have been elaborated very extensively in the literature, it is sufficient to document the main problems only briefly here. There are problems due to (among others):

- Regulatory capture
- Asymmetric information
- Lacking incentives for innovation

Recent economic analysis has used mechanism design to cope with some of the above, see Laffont and Tirole (1993). Nonetheless it will remain hard to provide the proper incentives to bureaucrats and politicians to supervise a pan-European clearing and settlement platform, and to provide the appropriate incentives to the regulated settlement infrastructure to:

- reveal exact cost information,
- remain cost efficient and not to appoint too much employees if a cost plus scheme is adopted,
- engage in cost reducing innovation even if this leads to lower fees in the long run,
- resist special interest groups who appoint members in the regulatory agency,
- etc.

In this context, it is worthwhile noting that Stiglitz (1997) argues:

> "The theoretical case for a government-run economy rests on the same highly restrictive assumptions as the case for a purely private market economy, notably the assumption that there is perfect information."

Hence the same factors that in many cases lead to market failures will by the same token lead to government failures. And some have argued that they will lead to even more pronounced failures as one leaves the purely economic arena to enter into the world of politico-economic considerations. Hence should market solutions be feasible, one should take them seriously. Such a market solution has been mentioned already above but it can be detailed somewhat further.

***Contestable market theory***

As mentioned, some have argued in favour of an industry configuration that collects several players competing against each other, while they have a very strong position in some countries or groups of countries. So even if they are not competing in the same regional market all of the time, the threatening force of entry is sufficient to guarantee a sound economic performance.

The central idea here is that in some markets, while competition ***in*** the market is difficult for a number of reasons (strong scale economies), this will not prevent that competition ***for*** the market might produce very desirable outcomes. This was shown for a variety of settings in the contestable market model introduced by Baumol, Panzar and Willig (1982).

This model however has its' limitations, see among others Van Cayseele and Furth (1996) for a critique in the perspective of reaction speeds of consumers and switching costs. But the theory certainly also has its' grounds and it introduces a market structure that has many advantages. In our view it moreover is applicable to the C&S-industry as long as artificial obstacles are not erected by incumbent (I)CSD's.

The choices that larger international issuers have when they float their securities can be much more targetted to the desires the investors favour, in the presence of multiple trading, clearing and settlement platforms. Especially if one compares this outcome to a single pan-European infrastructure as advocated by those in favour of regulation. With a few large (I)CSD's, an issuer has still several possibilities once he has chosen to finance an investment project externally. First of all there is bank financing by loans. Next there is the choice between debt and equity. Then there is the decision to list or not to list. Still further ahead is the decision regarding the Stock Exchange that will list and finally there is the possibility to dual list. At the same time there is the decision regarding who will do the safekeeping. For a detailed exposition, see Foucault and Parlour (2004).

The last choice is not necessarily dictated by the choice of the Stock Exchange, as long as the vertical silo model has been abandoned. Hence plenty of opportunities exist for the various functions that need to be taken care of, and this is a guarantee that there will be at least some competition for the market. Given that players in the market will understand that switching costs allow for future earnings well above the competitive level, competition for the market could be extremely fierce, this to the advantage of issuers.

***Conclusion***

The arguments given indicate that one should not disregard the "contestable quasi monopoly" outcome a priori. From a static welfare viewpoint, this configuration could lead to outcomes not remote from the first best, even with only a few players actively in the market at each point in time. The resulting competition for the market will safeguard the dynamic efficiency of the C&S-industry, a substantial advantage of this model. Finally, the huge problems associated with the implementation of regulation can be avoided. This is probably the greatest advantage of this model.

Of course, strong concentration has the danger of entailing anti-competitive behaviour. Therefore anti-trust authorities will have to keep a close look at this industry. Hence it is worthwhile to investigate for the current state of affairs, what the issues in competition policy are. The next section does precisely that. Starting from the knowledge that there are inevitable elements in the value chain that lead to strong concentration, market power is ***assumed***. That is, we pretend for a moment that the just described competition for the market only is a weak rather than a strong competitive force. Then we investigate how the resulting market power could be abused, and whether this is likely to happen. The focus is on pricing strategies, i.e. a static setting.

# 4. POTENTIAL ANTITRUST ACTIONS IN A STATIC MARKET

In the past, particular industries often were organised in a vertically integrated way on a national basis. With European market integration, operators active in one country wanted to extend their activities to customers in other countries, but sometimes ran into problems of access to certain crucial (*essential*) inputs. This most of the time happens with accessing infra-structural facilities like railroads and rail stations, ports and quays, and so on. Since most if not all of the economic activity has to pass through the particular item, they also are referred to as "bottlenecks".

Nowadays, some of these bottlenecks still are in place. Such situations have in the past led to antitrust challenges, especially if the crucial input was not made available to everybody on the same terms. Indeed, in the United States where antitrust cases based on the justified or unjustified denial to grant access have a long tradition, the first "essential facility" case has been around for a few decades and precisely involved a railroad terminal, see Reiffen and Kleit (1990).

Meanwhile, "essential facilities"- cases have been accumulating and thoughts have developed into a doctrine that is very powerful if used properly. And that hasn't always been the case, as noticed by Areeda who argues:

> "As with most instances of judging by catch-phrase, the law evolves in three stages: (1) An extreme case arises to which a court responds. (2) The language of that is then applied-often mechanically, sometimes cleverly-to expand the application. With too few judges experienced enough with the subject to resist, the doctrine expands to the limits of its language, with little regard to policy. (3) Such expansions ultimately become ridiculous, and the process of cutting back begins. Essential facilities is now in the expansionary second phase…"

Therefore it seems most appropriate to handle the theory in a detailed and careful way. For the moment, the doctrine has settled for a set of conditions that need to be satisfied ***simultaneously*** before one is able to conclude that an operation is an essential facility. The following list, see Table 1 below, is based on the work of an economist that has been associated with the Swedish Competition Authority, see Bergman (2000) and (2002).

**Table 1: Essential Facilities: necessary conditions**

| | |
|---|---|
| 1 | A stage of production or a factor of production, the "facility", is a monopoly or nearly so. |
| 2 | The firm controlling the facility competes in a related market in the same stage with one or more firms that do not have access to the facility. |
| 3 | Competing firms do not have the ability to duplicate the facility. |
| 4 | Competing firms are denied access to the facility, or are only provided access at discriminating conditions. |
| 5 | It is possible to provide access to the facility. |
| 6 | Access to the facility is necessary in order to compete in the related market. |
| 7 | The granting of access to the facility is likely to increase competition substantially. |
| 8 | Mandated access is not likely to reduce the incentives to invest or perform other desirable activities. |

This list shows that (I)CSD's do not operate as essential facilities since some conditions in the list provided in table 1 are not met or only met remotely.

The first and most crucial condition is whether any (I)CSD holds a monopoly position. Clearly the mere fact that there are many (I)CSD's, sometimes more than one in one and the same country, indicates that several players are active. If different (I)CSD's co-exist, they are likely to specialise on a regional dimension and according to the type of security that is processed. Since we have described the different choices that issuers can make when financing their operation, there is no monopoly position on this side of the market. (Unless an extremely narrow view on the definition of the relevant market (e.g. the only way to finance Numico is by issuing Dutch bonds) would prevail).

So the monopoly position might emerge with the subsequent trading of securities. Here of course the international diversification of investment portfolios again indicates that a very narrow market definition probably is not appropriate. But even in the case that an extremely narrow view regarding the relevant market is withheld, for example the Clearing and Settlement of Dutch Equity, the Dutch CSD doesn't hold a monopoly position. The reason is that other players, more in particular local agent banks can sometimes clear and settle on their books the position of their clients.

This will inevitably happen when the investors are in the same bank. With the increased consolidation that has taken place over the years, this phenomenon is only more and more likely to happen. Besides the local agent banks on the domestic scene, a few large global custodians dominate the international scene, and hence can internalise the clearing and settlement of trades that take place among large international investors. Finally, recent developments in the trading of securities, like crossing networks, imply that the origination of a trade no longer is necessarily a stock exchange, but it could equally well be a trading platform organised on the IT platform of a bank.

A crucial distinction regarding the definition of the relevant market therefore is key to the discussion. If the market is defined as the settlement of (I)CSD positions, then of course the (I)CSD holds a monopoly position, ***once the securities have been issued*** and located within the particular (I)CSD. Once trading has started however, secondary, involving internalised settlement activities develop, and as argued above, here the (I)CSD faces competition of local agent banks and to a lesser extent large custodians.

Moreover, few strategic actions can be taken to counter this development of secondary activity, should the I(CSD) want to do this. Below, we will enter into the details of possible misconduct (abuse of market power), but for the moment it is worth noting that given the importance of a liquidity pool for efficient settlement, it is not in the interest of (I)CSD's to refuse a client an account, especially not those bringing along a substantial volume of transactions. In addition, it is impossible for the (I)CSD to distinguish between the activities settled on behalf of proprietary trading of the local agent banks and/or large global custodians and those done for third parties. Hence, when a large client presents itself, it is impossible to know whether the business brought along is the result of trade creation (portfolio management activities and proprietary trading of the large client bank) or trade displacement (settling of net positions resulting from the internal gross settlement activities done for clients who are "diverted" from the (I)CSD). Given the strong network effects that prevail in this industry, this trade shifting effect comes at the cost of incurring important welfare losses. As shown by Holthausen and Tapking (2003), these losses can justify to some extent a policy which would discriminate in pricing between transactions settled for local agent bank vis-à-vis an investor, so as to raise the rival's, i.e. local agent banks' costs, thereby reducing his market share. But again, such a discriminating policy at the same time could destroy the trade creation effect of having the local agent bank as a client.

Coming back to essential facilities, the confusion in the debate seems to be between essential requisites or crucial inputs on the one hand and essential facilities or even more clearly the Essential Facilities Doctrine on the other hand. Indirectly, this confusion originates from the poor understanding of the concept of a Relevant Antitrust Market, see Werden (1992) or Van Cayseele (1994). We try to clarify the issue with some examples from other industries.

Suppose an exporter in Manchester wants to ship goods to Cologne in Germany. He will hire a transport company that will contact a shipping company, an insurance company and so forth. At the end of the day, a ship with the British export goods arrives in the port of Antwerp. In order to carry over the goods on a train to Cologne, the goods have to be stored briefly on a quay in the port of Antwerp. It now happens that:

- one operator say the former ( Hessen-Noord-Natie) owns all the quays in the port of Antwerp;
- the only way to get the goods on the train from Antwerp to Cologne is by storing them briefly on an Antwerp quay;
- (A third important fact for the competitive analysis involves the ownership of Hessen-Noord-Natie and will be introduced below).

Clearly then, the Antwerp quay is a crucial input in getting the exported goods from Manchester to Cologne over Antwerp by ship. But does that imply that Hessen-Noord-Natie is in a monopoly position because it owns all of the Antwerp quays? Suppose Hessen-Noord-Natie would start charging extremely high prices (they in fact would charge the monopoly price out of profit maximising motives). What will the reaction of the transport or shipping company be? They will start looking for alternative routes to Cologne, for example over Le Havre, Rotterdam, Bremen or Hamburg, ports in which other infrastructure owners set prices for temporary storage on their quays. (In detail studies by transportation economists have shown, by using Logit Analysis, that the ports mentioned are in the same antitrust market). And should also these operators charge very high prices, in the end and if the goods exported are not too bulky, the shipping company might even consider transport by airline to Cologne.

Hence, Hessen-Noord-Natie is faced with competition, and although they provide an essential requisite, they are not necessarily an essential facility. So the Essential Facilities Doctrine starts with an antitrust definition of monopoly. In particular the monopolist can and will raise prices independently because it doesn’t face competition from rivals and hence consumers have no alternatives. This seems not to be the case, neither in transport over water, nor in clearing and settlement.

To further illustrate how treacherous it is to substitute the concept of monopoly by crucial input in the list of criteria that constitute an essential facility, consider car manufacturing. In order to produce a car, one needs several components, like an engine, a frame, … and a gearbox. Most car manufacturers rely on a very limited number of gearbox manufacturers, but that does not make these essential facilities.

A very important idea underlying the Essential Facilities Doctrine is related to (bad) conduct rather than merely to a concentrated (monopoly-like) market structure. It has to be the case that the second and fourth criteria are also satisfied.

The second criterion to be satisfied involves competition between (I)CSD's and other players, for example in downstream markets. The fourth criterion indicates that these players are supposed to be at a competitive disadvantage by the fact that they are not an (I)CSD, because they can only access CSD services at discriminatory conditions.

First of all, it is important to establish the extent to which (I)CSD's are active in downstream markets. Probably this would be limited and for example the banking activities deployed by (I)CSD's could constitute only a subset of what local agent banks and global custodians do. They could merely be related to the time and risk transformation associated with clearing and settlement.

But the idea is that (I)CSD's extend their alleged monopoly position in the notary function to downstream markets, by denying access to the "bottleneck", or only granting an access under discriminatory conditions. Here it is clear from the outset that denying access to local agent banks is not an issue as argued earlier. So whether it is granted at discriminatory conditions is the issue. It is worthwhile briefly to investigate in a more detailed way what is considered by economists to be discriminatory practice.

When two consumers, one living near the seller while another living at 100 miles from the seller are served at the same price, economists will argue that the nearby consumer is discriminated against since it is much less costly to cater for him than for the consumer living far away. Similarly, if the cost of clearing and settling are less when straight through processing can be done because the instructions are generated within the system, it will be less costly to bundle services. An overall price proposal (i.e. the price for several services combined) could be less than the sum of the prices of the individual component services taken together without being discriminatory, and hence without having the intention to harm the downstream business of rivals. So it is important to get a good idea on the costs

for settling operations or provide downstream services when for example the communication with instructions originating outside the system lead to more failures in settlement. If these failures were more important, a higher price is justified.

The third criterion pertains to the possibility to duplicate the facility (or create "outside" production capacity) while the fifth asks whether capacity in the system is available. Here it is clear that the notary function cannot be easily duplicated for a given security. So the settlement of some positions has to go over the (I)CSD. But for settling gross positions between clients of one and the same investor bank or custodian, even internationally, there is the possibility to invest in similar technologies, for example through networks between associated players. For the global custodians, such international networks are obvious for many decades already.

The fifth condition states that providing access to the facility is possible. While this in general will always be the case, shortages of capacity could exist in certain trading periods. This implies that directly accessing the (I)CSD notary function might not be technically feasible at all moments. This of course might be perceived as a discriminatory rule, but it certainly is not a novel element in the discussion because facilities by nature have peak-loads in their usage. For a discussion in the context of one of the best known essential facilities cases in EC-law, viz. the Sea Containers vs. Stena Sealink case, see Van Cayseele (1994).

The sixth criterion involves the fact that access to the facility is needed in order to compete in the related market. This is without any doubt true but as argued already not for all of the C&S –activity. In the same context, the seventh criterion says that granting access would increase competition. As competitors to particular services supplied by (I)CSD's already have access, it remains to be shown how a different form of access is to increase competition substantially.

The last criterion says that intervention should preserve the appropriate incentives to invest and to engage in dynamic competition. So an overall appraisal has to be made, where besides the static welfare criterion also the dynamic performance of industry is taken into account. Clearly if (I)CSD's were to be catalogued as essential facilities, the regulation of access prices and conditions would follow. Should the access prices be too low, no possibilities to invest in future development of technology might be there.
It is most unlikely that all eight conditions hold simultaneously in the C&S business. Especially the mere fact that (I)CSD's are not really monopolies, or that they deny access

to downstream users is so evident that it would be hard to expect a different judgement on these matters. Also the fact that competing firms have no technologies to duplicate the infrastructure whereas more flexible access would increase competition substantially, are doubtful conditions. It therefore seems doubtful whether approaching (I)CSD's as essential facilities makes sense economically. It is also not clear that the remedies suggested for coping with essential facilities would improve upon the actual outcome.

# 5. FURTHER CONSIDERATIONS ON THE PERFORMANCE OF THE CLEARING AND SETTLEMENT INDUSTRY

In this section we consider further concerns that could rise given the recent developments in clearing and settlement. More in particular, we address the fact whether other groups, not mentioned in the analysis yet, could be affected. And also whether this would justify a particular set of interventions. More in particular, we first address the debate in the more political economy arena that clearing and settlement constitutes a public infrastructure. Then we address the issue of cross-subsidisation. The first issue is closely related to section 4, but the perspective now is broadened to include other interest groups. The same perspective drives the cross-subsidisation discussion which involves looking at C&S from the perspective of a two-sided market. Therefore, both of these aspects have been grouped in this sixth section.

***A public infrastructure?***

Sometimes it is argued that C&S constitutes a public infrastructure. Comparisons with the provision of electricity or telecommunications then are not far away. While many similarities between these sectors and C&S exist, it is not at all clear that the reasons to intervene are the same. Indeed, the "grid" that transports electricity certainly is a public infrastructure, regulated in many countries. The reason to intervene in this way here is technical and much related to the discussion in section 4 of the paper. But additional motives are called into the debate. The latter are far from having an analogy in C&S, as we will show.

Although neither electricity, telecommunications nor retail banking are provided any longer by public utilities in most countries, it is sometimes argued that they constitute a universal service. It is hard to live without a minimum of these services, and hence society has to make sure that any of its' individuals can benefit from these facilities. Theoretically, this line of argumentation links up with the maximisation of a particular type of social welfare function. The standard procedure to engage in political economy and to find the best outcome for society is to postulate a social welfare function (SWF) and to pick the set of actions (allocations) that maximise this SWF. The best-known and mostly used SWF is the sum of the individual utilities. The Benthamite objective is to maximise this function. An alternative is the Rawlsian objective, which is to pick the allocation that maximises the

welfare of the worst-off individual, see Atkinson and Stiglitz (1980) for a further discussion of both of these SWF's.

The Rawlsian SWF is not mentioned out of curiosity here, since it could have it's importance in the current setting. Indeed, the Rawlsian objective is thought to be justified when strong economies of scale lead to a natural monopoly outcome of an industry, and private monopoly pricing would seriously hurt the poor who need to buy the item because it is necessary, e.g. for survival. In those cases, it is often argued that regulation is certainly justified for not only might private monopoly pricing be incompatible with maximising a Benthamite objective, it certainly hurts the worst-off individual and hence is not permitted. Or it would also be in conflict with the Rawlsian objective.

This type of argumentation also is often used to provide minimum quantities (or qualities) of services for free to low income individuals. Examples are payment facilities in retail banking and minimum levels of free electricity in particular countries.

While it is even possible to doubt whether there are not better ways to achieve the Rawlsian objective, e.g. by allowances or income transfers out of general taxes, it certainly seems obvious that the grounds for invoking Rawls in this industry are hardly satisfied since the users of (I)CSD's probably are not the worst-off individuals. This probably goes for both the investors (should the Local Agent Banks fully pass on higher tariffs to their clientele) and the shareholders of the Local Agent Banks should those absorb part of the higher tariffs in the form of reduced dividends. Supplying certain amounts of free quantities moreover is likely to hurt competition, because it can be shown that such policies create entry barriers.

***Two-sided markets***

This, however, does not mean that there are no other groups involved. On the contrary. C&S is a two-sided market. If this is the case, some form of cross-subsidisation always will prevail. Although investors then might win from regulating the C&S-industry, it is not clear that companies will. For the moment, the investor side of the market seems to subsidise the other side and it is the question whether or not changes in the current market structure will not entail a more expensive financing of corporate investment. If this is the case, it might put a brake on growth of the European economies. These issues however have to be investigated in further detail before a final conclusion can be reached.

Nonetheless, by analogy to the credit card industry, where it was shown that it can be welfare maximizing to have one side of the market subsidising the other for reasons of achieving sufficient critical mass on both sides to get the platform working, we could argue that similar arguments prevail here. Especially if it is important to establish a sufficiently developed capital market, by having enough listed companies, the cost of an IPO will matter, together with the costs of safekeeping. If small companies are faced with this burden, they might turn away from direct finance (by issuing debt and equity), moving back to bank loans. Hence, if the purpose is to develop further securities markets, it seems appropriate to notice at least the possibility that changes on one side of the market could have implications for the other side.

# 6. CONCLUSIONS AND OPEN QUESTIONS

For the moment, there are two carefully elaborated viewpoints on the appropriate future industry configuration for C&S. One model proposes the so called “contestable quasi monopolies” outcome, while the other favours a pan – European monopoly with a regulator on top. The first approach relies on market forces and competition and is advocated by Serifsoy and Weiss (2003), while the other believes in government intervention and is due to Niels, Barnes and van Dijk (2003). The latter outcome is also favoured by the European Financial Services Round Table (2003).

For the moment we conclude that more belief should go to the contestable quasi-monopoly type of configuration than in the regulated overall monopoly. The reasons have been explained in detail in the paper but can be summarised as follows.

1. Technical efficiency can be reached with a few (I)CSD’s co-existing.

2. If that is the case, it is possible to rely on competition for the market while avoiding that a single pan-European CSD is created, which would have to be controlled by a costly regulator that is subject to government failure.

3. The “competition for the market”- approach at the same time preserves the incentives to innovate and implement technically better solutions over time.

4. In the absence of regulatory interference, competition policy is there to deal with any potential issue that could emerge in this industry.

5. For the moment we see no justification to warrant the application of the Essential Facilities Doctrine in this industry.
   This does not mean that competition policy should not follow the future developments in this industry.

6. The C&S-industry operates in a two-sided market with platform competition between certain players. For the moment it seems that the investor side of the market has been subsidising the issuer side of the market. If in the future solutions are put forward reducing the costs of trading securities between European countries, one should also include the future position of the issuers in the market. Otherwise we

could end up in a situation where trading the financial assets generated by the financing of past projects has become cheaper. But at the same time, the financing of new projects has become more costly. And this certainly would not bring the European Economy on a steeper growth path.

Given these reasons, the sensible conclusion is to leave the European C&S-industry developing further on its own. Specific antitrust issues always will be around in any given industry. The dynamics of the business at stake however will probably erode the strong positions of today, creating larger and more efficient players tomorrow. Potentially, this will lead to a cheaper functioning of the market.

Yet the many different legal barriers that still exist might reduce the scope of strong cost declines. Therefore, a future harmonization of national legislations seems carrying a far greater priority than regulating players, or even nationalizing them.

## BIBLIOGRAPHY


Armstrong M., 2004, Competition in Two-Sided Markets, *mimeo*, University College, London, 25 p.

Atkinson A. and J. Stiglitz, 1980, *Lectures on Public Economics*, McGraw-Hill, Maidenhaid, UK, pp. 339-340;

Baumol W., J. Panzar and R. Willig, 1982, *Contestable Markets*. Harcourt, Brace, Jovanovich.

Bergman M., 2000, *The* Role of the Essential Facilities Doctrine, *mimeo*, Swedish Competition Authority and The Research Institute on Industrial Economics, *mimeo*, Stockholm, Sweden, 38 p.

Bergman M., 2002, The Role of the Essential Facilities Doctrine, *Antitrust Bulletin.*

EFR (European Financial Services Round Table), 2003, *Securities Clearing and Settlement in Europe*, Executive Summary, Brussels, 7 p.

European Commission, 2002, *Commission Communication on Clearing and settlement. Summary of Responses.*

Foucault T. and C. Parlour, 2004, Competition for Listings, *Rand Journal of Economics*, pp. 329-355.

Giovannini Group, 2003, *Second Report on EU Clearing and Settlement Arrangements.*

Group of Thirty, 2003, *Global Clearing and Settlement, A Plan of Action.*

Holthausen, C. and J. Tapking, 2003, Raising rival's costs in the securities settlement industry, *mimeo,* E.C.B., 22 p.

Klemperer P., 1987, The Competitiveness of Markets with Switching Costs, *Rand Journal of Economics*, pp. 138-50

Kolari, J. and A. Zarkoohi, 1987, *Bank Costs, Structure and Performance,* Lexington.

Laffont J.-J. and J. Tirole, 1993, *A Theory of Incentives in Procurement and Regulation*, The MIT Press, Cambridge.

Lannoo K. and M. Levin, 2001, *The Securities Settlement Industry in the EU. Structure, Costs and the Way Forward,* CEPS Research Report, Brussels.

Niels G., F. Barnes and R. van Dijk, 2003, Unclear and Unsettled: The Debate on Competition in the Clearing and Settlement of Securities Trades, *European Competition Law Review*, pp. 634-639

Reiffen D. and A. Kleit, 1990, Terminal Railroad Revisited: Foreclosure of an Essential Facility or Simple Horizontal Monopoly?, *Journal of Law and Economics*, pp. 419-438.

Rochet, J.J. and J. Tirole, 2004, Platform Competition in Two-Sided Markets, *Journal of the European Econmic Association*, pp. 990-1029.

Schmiedel, H., M. Malkamäki and J. Tarkka, 2002, Economics of scale and technological development in securities depository and settlement systems, *Bank of Finland Discussion Papers*, 26, 33 p.

Serifsoy, B. and M. Weiss, 2003, Efficient Systems for the Securities Transaction Industry. A Framework for the European Union, *mimeo*, Johann Wolfgang Goethe-University, Frankfurt am Main, 32 p..

Shy, O., 1995, *Industrial Organisation*, The MIT Press, Cambridge, 68 p.

Spulber, D., 1999, *Market Microstructure, Intermediaries and the Theory of the Firm*, Cambridge University Press, 374 p.

Stiglitz, J., 1997, Looking Out for the National Interest: The Principles of the Council of Economic Advisers, *American Economic Review*, pp.109-13.

Stiglitz, J., 1999, Must financial crises be this frequent and painful?, *Policy Options*, pp. 23-32.

Swank, J., 1996, How Stable is the Multiproduct Translog Cost Function? Evidence from the Dutch Banking Industry, *Kredit und Kapital*, 29, pp. 153-172.

Tapking J. and J. Yang, 2004, *Horizontal and Vertical Integration in Securities Trading and Settlement*, ECB Working Paper Series, 387, 43 p.

Tirole, J., 1988, *The Theory of Industrial Organisation*, the MIT Press, Cambridge.

Van Cauwenberge S., 2003, New Structure for Clearing and Settlement Systems in the EU, *Financial Stability Review NBB*, pp. 83-103.

Van Cayseele P., 1994, *De Belgische Wet op de Mededinging, Concentraties in Industrieel Economisch en Internationaal Juridisch Perspectief*, Maklu.

Van Cayseele P. and D. Furth, 1996, Bertrand-Edgeworth Duopoly with Buyouts or First Refusal Contracts, *Games and Economic Behavior*, pp. 153-180.

Van Cayseele P., 1998, Market Structure and Innovation, *De Economist*, pp.391-417.

Van Cayseele P., 2004, Integration of Securities Settlement: The Incentives to Invest in Bundling, *mimeo*, in progress, C.E.S., K.U.Leuven, 30 p.

Van Cayseele P. and C. Wuyts, 2004, Cost Efficiency in the European Securities Settlement Industry, *mimeo*, C.E.S., K.U.Leuven, 25 p.

White L., 1999, Microsoft and Browsers, Are the Antitrust problems Really New?, in: Eisenach J. and T. Lenard (eds.), *Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital Marketplace.* Kluwer, Dordrecht, pp. 137-154.

Werden G., 1992, Market Delineation under the Merger Guidelines, A Tenth Anniversary Retrospective, *The Antitrust Bulletin*, pp. 517-555.