

DRAFT WORKING DOCUMENT ON POST-TRADING

1	THE IMPORTANCE OF POST-TRADING	2
1.1	THE ROLE OF POST-TRADING	2
1.2	THE GROWING AWARENESS FOR THE NEED TO ACT	3
1.3	THE FORTHCOMING IMPACT ASSESSMENT	5
2	THE FUNCTIONS, THE INSTITUTIONS AND THE SERVICE PROVIDERS	6
2.1	FUNCTIONAL DEFINITIONS	6
2.1.1	<i>Flow-related activities</i>	6
2.1.1.1	Verification	6
2.1.1.2	Clearing	7
2.1.1.3	Counterparty clearing and central counterparty clearing	7
2.1.1.4	Settlement	8
2.1.2	<i>Stock-related activities</i>	8
2.1.2.1	Establishing securities in book-entry form	8
2.1.2.2	Deposit	9
2.1.2.3	Account providing	9
2.1.2.4	Asset servicing	9
2.1.3	<i>Central functions</i>	9
2.2	INSTITUTIONS AND SERVICE PROVIDERS	10
2.2.1	<i>Institutions and service providers related to clearing, settlement and accounting providing</i>	11
2.2.1.1	Central Securities Depositories (CSDs)	11
2.2.1.2	International Central Securities Depositories (ICSDs)	14
2.2.1.3	Custodians and broker-dealers / settlement agents	15
2.2.2	<i>Institutions and service providers mainly related to counterparty clearing and central counterparty clearing</i>	15
2.2.2.1	Central counterparties	15
2.2.2.2	Clearing members	19
2.2.3	<i>Analysis of the overall trading – post-trading value chain</i>	19
2.3	COMPETITION CONSIDERATIONS	20
2.3.1	<i>Competition in post-trading</i>	20
2.3.2	<i>The role of post-trading infrastructures in the competition between trading platforms</i>	21
3	THE CURRENT SITUATION	23
3.1	ACCESS CHANNELS TO CSDs AND CCPs IN A CROSS-BORDER CONTEXT	23
3.2	A NATIONALLY SEGMENTED POST-TRADING INDUSTRY	25
3.3	THE CONSOLIDATION OF THE EU POST-TRADING INDUSTRY	27
3.3.1	<i>Euroclear</i>	28
3.3.2	<i>The Nordic Central Securities Depository (NCSD)</i>	28
3.3.3	<i>LCH.Clearnet</i>	29
3.4	CO-ORDINATING ACTIONS IN THE PRESENCE OF CONFLICTING INTERESTS	30
3.4.1	<i>Conflicting interests</i>	30
3.4.1.1	Roles of shareholders, management and users	30
3.4.1.2	Points of debate	31
4	THE COMMISSION'S OVERALL APPROACH AND OBJECTIVES	32
4.1	THE APRIL 2004 COMMISSION COMMUNICATION	32
4.2	RESPONSES TO THE COMMUNICATION	35
4.2.1	<i>Directive</i>	35
4.2.1.1	Rights of access	36
4.2.1.2	Common regulatory and supervisory framework	36
4.2.1.3	Governance - accounting separation and unbundling of services	38
4.2.2	<i>Competition</i>	39
4.3	CONCLUSION	39

5 THE BENEFITS OF INTEGRATED AND/OR CONSOLIDATED POST-TRADING SYSTEMS. 40

- 5.1 THE STATIC COST OF A FRAGMENTED POST-TRADING MARKET IN EUROPE 41
- 5.2 A FIRST-ORDER ESTIMATE OF THE POTENTIAL ECONOMIC SIGNIFICANCE OF A REDUCTION IN CROSS-BORDER POST-TRADING COSTS (“FIRST-ORDER DYNAMIC IMPACT”) 42
 - 5.2.1 *The impact of cost reduction on capital market equilibrium*..... 43
 - 5.2.2 *The impact on GDP*..... 45
- 5.3 A POSSIBLE REORGANIZATION OF THE SUPPLY SIDE (“SECOND-ORDER DYNAMIC EFFECT”)..... 47
- 5.4 CONCLUSIONS..... 48

1 THE IMPORTANCE OF POST-TRADING

EU financial-market integration is crucial for completing the Internal Market and is a key element of the Lisbon strategy for EU economic reform. In economic terms, an integrated¹ EU financial market without national barriers would have beneficial effects on growth and employment by allowing for a more efficient allocation of capital, better risk sharing, enhanced capital productivity and higher rates of capital accumulation. More specifically, the channels through which financial integration would deliver the economic benefits are: (i) deeper and more liquid markets, implying lower transactions costs and a reduced cost of capital for users; (ii) more diversified investment and financing opportunities for investors and borrowers respectively; (iii) a more competitive environment for financial intermediaries, leading to lower costs for borrowers, higher returns for investors and greater opportunities for financial innovation; and (iv) additional possibilities for risk-diversification and a more efficient pricing of risk. In addition, integrated EU financial markets would improve investor protection and the attractiveness of the EU as a location for investment, thereby increasing foreign capital inflows and promoting the further development of the euro as an international currency.

Reaping the full benefits of a fully integrated and safe EU financial market requires, the existence of an efficient and safe post-trading system.

1.1 *The role of post-trading*

What is post-trading and why does it play such an important role in EU financial markets integration? Post-trading has been referred to as the "plumbing" of the securities markets, a chain of actions designed safely to transfer ownership of a security from the seller to the buyer in return for payment². Although unglamorous and traditionally ignored (it is trading that usually captures most, if not all, of the public's attention), this dimension of financial markets is fundamental for the proper functioning of the whole. It is, in fact, the very essence of the markets, because it constitutes the basic process of exchange between buyers and sellers of securities. Without efficient post-trading services an efficiently functioning securities market could not exist.

While generally efficient and safe within national borders, various national post-trading systems combine and communicate less efficiently and (potentially) less safely across borders, which means that an international investor faces higher costs and higher risk when making a cross-border securities transaction:

- a cross-border investor incurs three types of **additional costs** if the post-trading infrastructure is not efficient. These are (i) direct costs in the form of higher fees for the

¹ Achieving the law of one price (i.e. if assets have identical risks and returns, then they should be priced identically, regardless of where they are transacted) is often chosen as a definition for market integration (see, for example, European Commission (2004)). A broader definition of financial integration can be found in Baele et al., *Measuring European Financial Integration*, Oxford Review of Economic Policy, Vol 20 N. 4 (2004): "The market for a given set of financial instruments and/or services is fully integrated if all potential market participants with the same relevant characteristics (1) face a single set of rules when they decide to deal with those financial instruments and/or services; (2) have equal access to the above-mentioned set of financial instruments and/or services; (3) are treated equally when they are active in the market."

² More formal definitions of the various functions and institutions involved in the post-trading process are given in chapter 2 and its annex (Annex X).

use of post-trading services, (ii) indirect costs in the form of higher back-office fees for managing post-trading transactions, and (iii) opportunity costs in the form of an inefficient use of collateral, failed trades and trades not undertaken at all because of the inefficiency of arrangements;

- financial actors operating across borders face **heightened risk** in areas such as (i) legal certainty, i.e. possible conflicts between procedures, rights and duties in different jurisdictions, (ii) counterparty creditworthiness, i.e. the possibility that a counterparty may fail to meet its obligations, (iii) liquidity risk, i.e. a temporary failure to pay on time, and (iv) operational risk, i.e. the threat of processing failures or managerial problems. All these risks are exacerbated in a cross-border context if there are national differences in market practices, legal frameworks and regulatory requirements.

Of course, the additional risks in cross-border operations are not confined to the individual investor. An efficiently and safely functioning post-trading infrastructure is also indispensable for the sound execution of monetary policy, because almost all of the eligible collateral for monetary policy operations in the EU, especially the euro area, flows through securities settlement systems. This means that the conduct of monetary policy is highly dependent on a smoothly functioning post-trading infrastructure. Problems with this infrastructure could therefore lead to serious disruptions in the conduct of monetary policy.

From a central bank's point of view the post-trading infrastructure also plays a crucial role in the smooth functioning of payment systems and in maintaining the integrity of financial markets. An interruption in the proper functioning of or a breakdown in the post-trading infrastructure could therefore seriously disrupt the market and ultimately pose a risk to a financial system's stability and consequently to the economy as a whole.

While not an ultimate objective per se, an efficient and safe EU market for post-trading services is thus indispensable for raising the growth potential of the EU economy, due to its crucial role in EU financial markets integration. Although the integration process is well underway in a range of areas, especially in wholesale markets, progress has varied markedly across the different sectors of the financial system. In particular, while the unsecured segments (where collateral is involved) are at an advanced stage of integration, many secured cross-border activities, ranging from equity trading to repurchase agreements, are lagging behind, due to the fragmented nature of cross-border infrastructure arrangements. This uneven progress of financial markets integration results in a growth rate for the EU economy that is less than it could be.

1.2 The growing awareness for the need to act

While efforts to improve the efficiency and safety of cross-border post-trading arrangements in the EU date as far back as the 1970s, only recently has the reform process gained momentum. The main reason behind the growing interest in post-trading in the last few years has been the explosive growth in securities trading (both domestic and cross-border), which was in turn fostered by two groups of factors:

- the first group is made up of global factors, such as technological progress (allowing for faster and more accurate processing of a larger number of transactions and for easier communication among the various actors in the markets, which made physical distances irrelevant), deregulation and liberalization (which opened up and introduced competition in both the financial and other markets, such as telecommunications) and globalisation (increasing the demand for cross-border transactions and capital flows);

- the second group contains factors specific to the EU, namely intensified political commitment to the process of EU financial integration, which manifested itself in the introduction of the euro (which removed exchange-rate risk and expanded the relevant market from one based on national to one based on currency borders), the progressive implementation of the Financial Services Action Plan (FSAP) and the introduction of a more flexible legislative framework at EU level (the Lamfalussy process³). These stimulated an increase in the demand for EU-wide securities trading, thus exposing the longstanding problems with the inter-operability between national post-trading systems and making a more integrated industry a major item on the EU policy agenda.

The increased interest in post-trading is best reflected in the growing number of studies and regulatory initiatives that have been carried out in recent years, especially within the EU:

- in February 2001, the **Lamfalussy** report on financial services regulation (initiating the Lamfalussy method mentioned earlier) highlighted the necessity of further restructuring post-trading in the EU. The report spelled out the most important policy issues, such as (i) the excessive costs of cross-border post-trading due to fragmentation, (ii) competition issues like open and non-discriminatory access and exclusivity arrangements, (iii) the soundness of technical linkages between CSDs and (iv) whether post-trading systems should be authorised and supervised according to common European standards. While it was noted that consolidation should be driven by the private sector, the report explicitly concluded that the latter would be unable to deliver an efficient EU-wide post-trading system on its own;
- in November 2001, the **first Giovannini Group Report**⁴ provided a detailed analysis of the current barriers in European post-trading (see chapter 3 for a more detailed discussion), while a **second Giovannini Group Report**⁵, published in April 2003, put forward a detailed roadmap for dismantling them through (i) a clear allocation of responsibility for each barrier (including both the private and the public sector), (ii) a sequence for their removal and (iii) clear deadlines (with a maximum of three years) for their elimination. Similarly to the Lamfalussy report, the Giovannini reports noted that while the processes of integration and consolidation should be driven by the private sector, the public sector's involvement would also be necessary to eliminate some of the barriers;
- in February 2001, the **European Association of Clearing Houses (EACH)** drafted high-level standards of risk management controls for the clearing activities of central counterparties;
- also in 2001, the **Committee on Payment and Settlement Systems (CPSS)** of the central banks of the Group of Ten countries and the **International Organization of Securities Commissions (IOSCO)** put forward a set of recommendations for securities settlement systems. These recommendations aim at improving financial stability by strengthening financial market infrastructures. The recommendations

³ The Lamfalussy report, (Lamfalussy et al. ., *Final report of the committee of wise men on the regulation of European securities markets*, 15 February 2001), can be found on the Commission's website: http://europa.eu.int/comm/internal_market/securities/lamfalussy/index_en.htm.

⁴ "Cross-border Clearing and Settlement Arrangements in the European Union", The Giovannini Group (November 2001). The Giovannini Group comprises private-sector experts, under the chairmanship of Dr. Alberto Giovannini, which advises the Commission on financial-sector issues.

⁵ "Second Report on EU Clearing and Settlement Arrangements", The Giovannini Group (April 2003).

identify the minimum standards that securities settlement systems should meet and are designed to cover systems for all types of securities, both in industrialised and developing countries and both for domestic and cross-border trades;

- in 2003, the **Group of 30 (G30)** put forward 20 recommendations aimed at (i) creating an interoperable global network, (ii) increasing risk mitigation and (iii) improving governance. Since then, the G30 has established a committee of private and public sector participants responsible for monitoring the implementation of these recommendations, which was completed in April 2006. Although the G30 recommendations provide the basis for much-needed global standards, their global nature seems to offer less specific guidance in an EU-specific context;
- in 2004, the **Committee of European Securities Regulators (CESR)** and the **European System of Central Banks (ESCB)** transformed the CPSS-IOSCO recommendations into a set of European standards for the regulation and supervision of post-trading⁶. The CESR-ESCB standards aim at providing a more consistent basis for the regulation, the supervision and the oversight of securities post-trading systems, mainly by focusing on subjects such as safety, soundness and investor protection.

1.3 The forthcoming impact assessment

In light of the importance of post-trading for the EU economy, it is paramount not only to have an efficient and safe post-trading system, but also to have it as soon as possible. The forthcoming impact assessment, which will be substantially based on this document, aims to answer the following two questions:

- i) What is the economic importance for the EU economy of achieving integration in the post-trading industry?
- ii) What, if any, Community initiative should be taken to best ensure that benefits for the EU economy are fully reaped?

Please note that the topic of safety – financial stability and investor protection – is not tackled in a detailed manner (reference to safety is made in chapter 4). This topic will be addressed in the forthcoming impact assessment.

⁶ The joint work is due to the fact that securities settlement systems fall under the competence of both central banks and securities or banking supervisors.

2 THE FUNCTIONS, THE INSTITUTIONS AND THE SERVICE PROVIDERS⁷

The aim of this chapter is twofold. First, it aims at providing the functional definitions that are used throughout this document (section 2.1). Secondly, on the basis of these definitions, it aims at describing the main institutions and service providers which are involved in the post-trading industry (section 2.2). The descriptions principally reflect the situations at national level.

2.1 *Functional Definitions*

This section gives an overview of the definitions of the most important functions as they have been used throughout this document. These definitions were developed with the assistance or the continuous consultation of the CESAME subgroup on definitions.

They mainly capture the functions, rather than the institutions and the service providers, involved in post-trade activities. This functional basis implies that the definitions set out here are intended, as much as possible, to describe technical processes.

The work so far has focused on securities. It is intended that the definitions should also capture derivatives. In consequence, in order to capture derivatives the definitions may be slightly amended or further definitions might be developed. It may also be noted that, to avoid unnecessary complication, terms with strongly legal connotations ("netting" or "execution", for example) have been avoided.

As the work has proceeded, it has become clear that "clearing and settlement", although intended to be used generically, may have misleadingly narrow connotations. Accordingly, the entirety of the subject-matter will be called "post-trading activities".

In order to found the discussion into technical processes, it has been helpful as an informal analytical tool to distinguish between **flow-related** and **stock-related activities**. Flow-related activities refer to all activities that are transaction-dependent and which lead to the completion of the transaction. Stock-related activities refer to activities which are independent of transactions, e.g. deposit.

2.1.1 **Flow-related activities**⁸

Loosely speaking, flow-related activities start after a transaction in securities has been agreed between two counterparties and stops with the transfer of *securities, cash or both* between the final investors.

2.1.1.1 *Verification*

Verification: *The process of comparison and reconciliation of transaction or settlement details, to ensure that there is agreement on these details.*

⁷ This chapter analyses the technical aspects of post-trading. Those readers that are not interested in these aspects may therefore wish to skip this chapter and go directly to chapter 3.

⁸ This section and the following one (2.1.2) are based on the Commission services working document of 27 October 2005, which has been published and is available on the homepage of the CESAME group (http://ec.europa.eu/internal_market/financial-markets/docs/cesame/ec-docs/20051027_definitions1_en.pdf).

The functions that are covered under this heading may be interpreted as the process of comparison and, where the comparison reveals discrepancies, reconciliation of discrepancies in either transaction or settlement details.

2.1.1.2 Clearing

Clearing: *The process of establishing settlement positions, including the calculation of net positions, and the process of checking that securities, cash or both are available.*

Clearing ensures that all the prerequisites for settlement are in place. Thus, the proposed definition is intended to cover every function performed in the course of the post-trading process between verification and settlement, excluding these two and counterparty clearing, but including the resource check. This latter is one of the prerequisites, arguably one of the most important, for settlement.

2.1.1.3 Counterparty clearing and central counterparty clearing

Counterparty clearing: *The process by which a third party interposes itself, directly or indirectly, between the transaction counterparties in order to assume their rights and obligations.*

Central counterparty clearing: *The process by which a third party interposes itself, directly or indirectly, between the transaction counterparties in order to assume their rights and obligations, acting as the direct or indirect buyer to every seller and the direct or indirect seller to every buyer.*

As mentioned above, counterparty clearing is not included in the definition of clearing. As the risks associated with counterparty clearing are different from the risks associated with the other functions, it is important that it should be captured by an independent definition.

The definition of counterparty clearing captures the process by which a third party interposes between the counterparties of a transaction with the specific aim of assuming their rights and obligations. Interposition and the consequent assumption of rights and obligations is the characterising element of the function of counterparty clearing. Interposition is relevant – regardless of the legal instrument chosen, e.g. novation or open offer – because it entails the assumption of counterparty credit risk⁹.

The definition of central counterparty clearing refers to the fact that the interposing third party acts as the direct or indirect buyer to every seller and the direct or indirect seller to every buyer. This is intended to give operational contents to the term “central”. The definition of “central counterparty clearing”, therefore, is perfectly capable of capturing the traditional Central Counterparty (CCP) activity with respect to market segments where use of the CCP is compulsory.

In other words, while the definition of counterparty clearing refers to the activity of interposition in isolation, the definition of central counterparty clearing refers to (i) the interposition between the transaction counterparties; (ii) the fact that interposition happens for

⁹ The central position assumed by the CCP implies that General Clearing Members (GCMs) are not able to protect themselves from the risk of insolvency of the CCP and therefore need to rely on the effectiveness of the CCP risk-management procedures to be able to offer their services to Non-Clearing Members (NCMs) and clients.

every transaction (of course, this is true with respect to a particular commercial context or market segment)¹⁰.

2.1.1.4 Settlement

Book-entry settlement: *The act of crediting and debiting the transferee's and transferor's accounts respectively, with the aim of completing a transaction in securities.*

The proposed definition covers only the last act of the process: the transfer. It does not refer to any segment of the value chain that comes before the transfer itself, which would be included in the definition of verification, clearing or counterparty clearing. Settlement is defined as the acts of crediting and debiting the transferee and transferor's accounts. The definition does however make it explicit that such credits and debits have the aim of completing a transaction in financial instruments. There is no necessary presumption that credits and debits should be simultaneous.

Since settlement can normally be achieved at different levels, the proposed definition has the advantage of being institutionally neutral, i.e. it does not depend on whether credits and debits are made in the accounts provided by a Central Securities Depository (CSD) or by someone else (e.g. a custodian). One could, nonetheless, refine the definition of settlement to include an element of centrality (see section 2.1.3).

2.1.2 Stock-related activities

Stock-related activities cover a range of activities which are related to the existence of the stock itself and are independent of the completion of transactions. These activities include, *inter alia*, establishing securities in book-entry form, deposit, account providing and asset servicing.

2.1.2.1 Establishing securities in book-entry form

Establishing securities in book-entry form: *The initial representation and subsequent maintenance of securities in book-entry form through initial credits and subsequent credits or debits to securities accounts, on the basis of: (a) the information provided by the issuer or its agent; or (b) the number of securities on deposit.*

Nowadays, most securities issues are dematerialised or immobilised. Dematerialised securities are created and represented exclusively in book-entry form. Immobilised securities are not created in book-entry form – they exist as physical securities – but they are also represented in book-entry form. In both cases, they are transferred through debits and credits to securities accounts. In loose terms, the definition of establishing securities in book-entry form is intended to capture, and applies to, both dematerialised and immobilised securities.

The purpose of the definition is to capture the function that is nowadays necessary for the securities to be distributed to final investors following primary market operations and subsequently transferred in secondary market. This function is typically performed by CSDs. The essence of the function is the same for both dematerialised and immobilised securities, but the details may differ.

¹⁰ When looking at the first element in isolation – the interposition – we see that it is not exclusively applicable to CCPs. CCPs interpose themselves between Clearing Members (CMs); GCMs interpose themselves between indirect or NCMs or between NCMs and the CCP. In all these relations there is interposition. However, only the CCP is "central".

It may be noted that, against the background of the proposed definition, the reference in the Commission Communication of April 2004 to “restrictions relating to the issuer’s ability to choose the location of its securities” may be interpreted as restrictions relating to the issuer’s ability to choose which service provider will be responsible for establishing securities in book-entry form.

2.1.2.2 Deposit

Deposit: *The storage of physical securities on behalf of others.*

While the definition of “establishing securities in book-entry form” is intended to cover both dematerialised and immobilised securities, this definition is limited to physical securities. Its aim is also very limited as it intends to capture the mere “storage” of physical securities.

2.1.2.3 Account providing

Account providing: *The maintenance of securities accounts.*

This activity involves a relationship between a service provider – the “account provider” – and its client – the “account holder”. With two exceptions, all entities from final investors to the provider of “establishing securities in book-entry form” services, provide and hold securities accounts. The two exceptions are nonetheless relevant. **Final investors** acting in this capacity do hold but do not provide securities accounts. The provider of “establishing securities in book-entry form” services acting in this capacity – typically a **CSD** – provides but does not hold a securities account.

2.1.2.4 Asset servicing

Asset servicing: *Securities administration activities performed for others, e.g. processing of corporate actions, tax reclaims and portfolio valuation.*

Such activity includes:

- processing of corporate actions, including voting instructions and income and redemption payments;
- processing of tax reclaims;
- portfolio valuation.

The activity does not include provision of credit.

2.1.3 Central functions

Most of the functions performed by a CSD (see next section) include an element of centrality whenever they are performed in association or connection with the function of establishing securities in book-entry form. Against this background, one can define the following "central" functions:

Central account providing: *The function of account providing performed, for a given issue, by the entity performing the function of establishing securities in book-entry form.*

Central book-entry settlement: *The function of book-entry settlement performed, for a given issue, by the entity performing the function of establishing securities in book-entry form.*

Central clearing: *The function of clearing performed, for a given issue, in direct connection with the function of central settlement.*

Central verification: *The function of verification performed, for a given issue, in direct connection with the function(s) of central clearing (and central settlement).*

There is an asymmetry between the definitions of central account providing and central book-entry settlement¹¹, on the one hand, and the definitions of central clearing and central verification, on the other.

The first two have in common with the definition of establishing securities in book-entry form the reference to securities accounts. In other words, the securities accounts that are used to establish the securities in book-entry form, are those where securities are held, i.e. those securities accounts that are used to perform the function of account providing, and are the same securities accounts where transfers are debited and credited, that is those securities accounts that are used to perform the settlement function. This means that, by definition, the same entity that performs the function of establishing securities in book-entry form also performs the account providing and settlement functions. This is reflected in the definitions of the functions of central account providing and central book-entry settlement.

On the other hand, even though efficiency arguments justify the joint provision of, at least, the clearing function as well as the functions of establishing securities in book-entry form, central account providing and central book-entry settlement, the former (i.e. clearing) might *theoretically* be performed by a different entity from that performing the latter functions (i.e. establishing securities in book-entry form, account providing and book-entry settlement). For this reason, the definitions of the functions of central clearing and central verification refer, respectively, to the functions of clearing and verification which are performed *in connection* with the function of central book-entry settlement.

2.2 Institutions and service providers

As in most markets, the four main groups of actors in the post-trading industry are:

- **the demand side:** final investors (e.g. investment funds, banks, retail clients etc.) and other users of the system (e.g. liquidity providers like broker-dealers);
- **the supply side:** central securities depositories, central counterparties and international central securities depositories; these institutions are often referred to as infrastructures;
- **the intermediaries:** custodian banks, settlement agents and clearing members;
- **the control authorities:** central banks, banking authorities, national regulators and the Commission.

This section focuses on the analysis of the infrastructures and intermediaries. These can also be grouped based on the functions they perform. From this point of view it is possible to distinguish between (international) central securities depositories and custodians/settlement agents, on one hand, and central counterparties and clearing members, on the other. The former perform functions related to clearing, settlement and account providing, while the latter mainly perform functions related to counterparty clearing and central counterparty clearing.

¹¹ The Commission has distinguished in the Clearstream decision that settlement at the CSD takes place at a different level to settlement by intermediaries (including when the CSD acts as an intermediary).

Building on the functions as defined in the first section, the present section aims at describing the main institutions and service providers present in and the competitive structure of the post-trading industry. Understanding the current structure of the industry is essential for understanding its likely evolution and for policy making in general.

2.2.1 Institutions and service providers related to clearing, settlement and accounting providing

2.2.1.1 Central Securities Depositories (CSDs)

There are evident economies of scope among the functions of the post-trading value chain, as defined in section 2.1¹². For this reason, CSDs are involved in the provision of some or all of such functions, except for the function of (central) counterparty clearing. The latter statement deserves further qualifications.

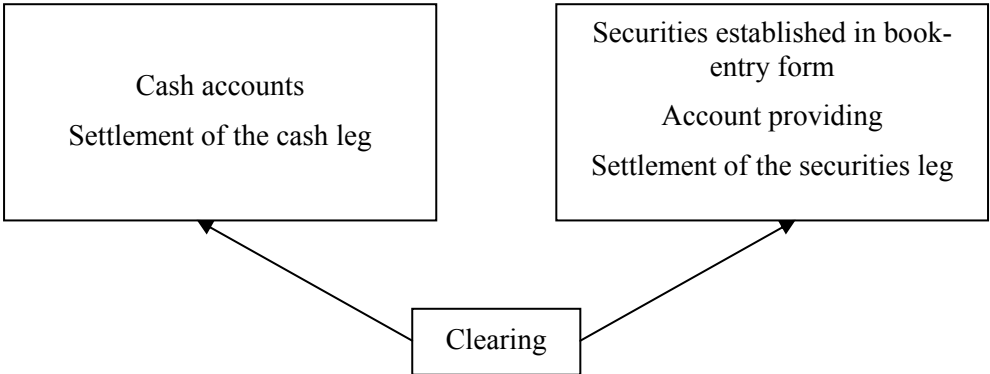
First, the degree in which CSDs are involved in the provision of asset servicing varies enormously from one CSD to another. The two extremes are represented on one end by CSDs (e.g. certain Nordic CSDs) which provide accounts for final investors and keep the registry of owners for corporate actions – where the involvement is highest – and, on the other, by CSDs that do not have any relation with issuers – where there is no involvement at all, e.g. Clearstream Bank Frankfurt with respect to bearer securities (the majority of the securities issued in Germany¹³).

Second, in order to increase the degree of Straight Through Processing (STP), some CSDs also perform the verification function, e.g. Monte Titoli.

The "core" functions for which synergies are most evident seem to be the following (see figure 1):

- establishing securities in book-entry form;
- account providing;
- settlement;
- clearing.

Figure 1: The most important functions associated with the activities of CSDs



¹² For example, the function of establishing securities in book-entry form incorporates the function of account providing; the settlement of the securities leg involves crediting and debiting the transferee’s and transferor’s securities accounts maintained by the account provider; as clearing involves all the processing which is required for settlement to be achieved, clearing and settlement are complementary services.

¹³ ECSDA, *Survey on ECSDA Members' Services*, 2005.

Besides economies of scope along the value chain, CSDs are characterised by economies of scale, economies of scope (horizontal), and network effects. It should be also noted that, when accessing CSDs, users incur connection costs. Each of these features will now be examined in more detail.

Economies of scale

Economies of scale occur when firms achieve per unit cost savings by producing more of a good or service, i.e. when average costs decrease as output increases. Such effects arise when it is possible to spread fixed costs over a higher output.

The impressive technological progress of the last 20 years has allowed CSDs to automate the post-trading activities they perform, reducing costs and enhancing safety. Due to the fact that high investments in IT are necessary to achieve the appropriate level of automation (including both development and maintenance costs), the CSDs' activity is characterised by high fixed, compared to variable, costs and therefore high levels of economies of scale.

On the other hand, one might expect that the same advances in technology would have reduced the fixed costs which characterise the CSD activity, reducing the degree of economies of scale. However, due to increased volume and, according to some commentators, demand for increasingly complex and sophisticated services, total IT costs have greatly increased and are expected to continue to increase in the future as well.

Because of the preponderance of fixed costs in the CSD's activity, while in principle it would be possible to have competing CSDs providing services in the same issue (ISIN¹⁴), doing so would probably lead to duplication of investments and therefore to increases in overall costs. Moreover, since a transaction between a transferor and a transferee using the services of two competing CSDs is possible only if the two CSDs communicate through a link, to the extent that establishing and maintaining the link entails a cost, overall costs would rise further.

The most efficient arrangement therefore seems to be that a single issue is established (in book-entry form) in a single CSD.

Economies of scope (horizontal)

Economies of scale call for a single issue to be established in a single CSD. This in itself does not exclude an industry structure in which each issue is established in a different CSD. However, such a structure would hardly be viable, as it most likely would not allow CSDs to recoup the fixed costs which characterise their activity. To be viable a CSD must be able to exploit significant (horizontal) economies of scope.

Economies of scope occur when firms achieve cost savings by increasing the variety of goods and services that they produce (joint production). Such effects arise when it is possible to share components and to use the same facilities and personnel to produce several products or services.

Economies of scope are therefore defined with respect to the provision of different services, which, in the CSD context, can be considered to be different issues (ISINs). As long as the different securities (with different ISINs) have the same legal, fiscal and technical characteristics, if a CSD extends the number of issues (ISINs) for which it provides services (both flow-related and stock-related services), it should be able to use its existing platform(s). In doing so, it may incur some fixed cost, but this cost is likely to be low relative to the initial investment.

¹⁴ International Securities Identification Number: a unique international code which identifies a securities issue.

Under the stated conditions, it is therefore efficient that multiple issues are established (in book-entry form) in a single CSD.

Users' connection costs

When accessing CSDs users incur connection costs. These include the cost of the physical connection, i.e. the cost stemming from the need to adapt in-house procedures and back office systems to that of the CSD, and the cost of learning the rules of the system.

For users, connections costs represent fixed costs, i.e. they are independent of the level of the demand of a particular security (ISIN) and of the number of securities of the same issue. Therefore, as long as the securities belonging to the different issues dealt with by a single CSD have the same legal, fiscal and technical characteristics, connection costs imply economies of scale and scope on the demand side. Accessing a single CSD, as opposed to accessing multiple CSDs, therefore minimises users' connection costs. This means that if users can access CSDs that in turn have links with other CSDs, connection costs are minimised.

It is therefore efficient for users to have a single means of connecting to all CSD services which they require.

Network effects

A market is said to be characterised by network effects (also known as network externalities) if a client's utility of being in the market increases with the total number of clients. Network effects may make a market "tippy" according to the following logic:

- the firm with higher market share has a competitive advantage because the investors' utility associated with its services is higher than that associated with its competitors' services;
- the firm which gains a competitive advantage, even small, may over time achieve complete market dominance;
- the process is self-reinforcing: the bigger the competitive advantage, the shorter the period of time in which complete market dominance may be achieved.

From the above it follows that "tippiness" leads to a first-mover advantage, even in the case that the first-mover has an inferior technology. Moreover, the first-mover may achieve market dominance in a very short time. Such markets may periodically exhibit technological innovation, often associated with competition for the market, but may also remain locked into inferior standards for protracted periods.

Commodity markets that are characterised by network effects are likely to evolve towards a monopoly structure unless there are barriers to consolidation¹⁵.

However, there are also many examples of networks which support so-called "multi-homing". In this scenario, all or a group of customers may be members of multiple networks, either to exploit differences in the service offering or to hedge against exploitation by a single provider which acquires market power.

Networks can be one-sided or two-sided. Rochet and Tirole (2005)¹⁶ define a network as two-sided if two groups of customers can be identified such that the volume of output is sensitive

¹⁵ This is true also in the absence of economies of scale.

¹⁶ J.-C., Rochet & J. Tirole, "Two-sided markets: an overview", (U. Toulouse, IDEI Working Paper, 2005), available at http://idei.fr/doc/conf/tsm/rochet_tirole.pdf.

to the division of the price between them. In two-sided networks, indirect network externalities exist between the two groups of customers, such that an increase in consumption by one group of customers increases the value of the consumption to another, distinct set of users.

A CSD can be considered as a two-sided network. In this context, the two categories of consumers mentioned above are final investors or their intermediaries (users), and issuers. According to the above logic, in addition to the usual direct (intra-group) externalities (arising from the fact that, for example, investors/users care about how many other investors/users use a CSD), the existence of two categories of consumers of CSD services means that indirect (inter-group) externalities also exist.

Costs of monopoly provision

Against the possible benefits that can be achieved by consolidation, the potential costs of monopoly provision also need to be considered. These will obviously depend on the extent to which the entity in question pursues a profit motive. In the worst case, prices set by a CSD could be set such as to deter a significant amount of trading from occurring. A competitive market structure would avoid this problem. To the extent that there is currently little or no competition, on the other hand, there would be no marginal loss from consolidation of monopoly provision at a wider scale (assuming regulatory issues were appropriately addressed), although this does not mean it is the best possible outcome that can be achieved.

It also needs to be borne in mind that as long as markets are segmented, the costs necessary to serve them may be sunk. The full range of potential efficiencies from consolidation may then be hard to achieve, even if consolidation actually occurs. Under these circumstances there is no incremental inefficiency from competition. Moreover, following this line of argument further, it is also the case that even if the EU market were perfectly integrated with a single supplier, welfare gains might be achieved by making markets contestable by providers from third countries which would incur relatively limited incremental costs to enter the EU market.

* * *

On condition that the market has a critical size, which enables it to absorb the fixed cost associated with the CSD activity, the existence of economies of scale and scope, connection costs and network effects appears to be consistent with the market structure that can be observed in the various Member States (i.e. a single CSD). The above economic considerations were, however, not the only ones that affected the market structure as it can be observed today. An important role in this process was also played by historical influences (e.g. different interactions between users and issuers), regulatory influences and trading platforms (see section 2.3 for details).

2.2.1.2 International Central Securities Depositories (ICSDs)

In the EU, there are two institutions which are commonly referred to as ICSDs. These institutions are Euroclear Bank and Clearstream Banking Luxembourg. ICSDs specialise in the provision of post-trading functions for so-called Eurobonds and other, mostly fixed income, securities. ICSDs are very similar to CSDs, in that, as in the case of the latter, the characterising function of ICSDs is also said to be that of "establishing securities in book-entry form" (which ICSDs perform with respect to Eurobonds). Nonetheless, there are at least two important differences between the two. Indeed, contrary to CSDs:

- ICSDs do not perform the "deposit" function;
- a single issue is not established with a single ICSD, but rather with both ICSDs.

Box 1: The Eurodollar, the Eurobond markets and the ICSDs

The origin of the ICSDs can be found in the growth of the Eurobond market, i.e. bonds issued in another currency than that of the country where it is issued. The Eurobond market in its turn originated from the Eurodollar market, i.e. US dollars deposited in US banks outside the US.

The Eurodollar market originated in the 1950s when the Soviet Union and other communist states decided to deposit its dollar oil-revenues outside the US, as it feared that these revenues might otherwise be frozen. However, this process soon spread to other market operators as well, who discovered that by placing their deposits abroad they could avoid exchange transactions and benefit from interest rate arbitrage (avoiding the US regulation Q, which sets a ceiling on interest paid by banks on their deposits). It was fuelled by the fact that these deposits were exempt from withholding taxes. An additional boost was that the US ran continuous balance-of payment deficits, which increased the amount of credit flowing from the US to other countries. As more and more banks participated, this led to the creation of a liquid international money market.

The Eurodollar market expanded into certificates of deposits and Eurobonds. Eurobonds are international bonds issued by a syndicate of securities houses in any international currency and placed in more than one country. An important characteristic of the Eurobond market is the non-application of withholding taxes. Under the EU's savings taxation directive, the Eurobonds already in circulation before 1 March 2001, will continue to benefit from this provision under a grandfather clause until the end of 2010 (see Article 15 of the Council Directive 2003/48/EC). Most trading in Eurobonds is currently taking place in London – and to a large extent, over-the-counter (OTC).

Source: Adapted from Lannoo and Levin (2001)¹⁷, p.7.

2.2.1.3 Custodians and broker-dealers / settlement agents

In a domestic context, CSDs' account holders typically are financial institutions such as banks and investment firms. Banks and investment firms intermediate between CSDs and final investors¹⁸ – in which case they are referred to as **custodians** – and between CSDs and broker-dealers in case the latter do not want to access directly the CSD – in which case they are referred to as **settlement agents**.

In so doing, custodians and settlement agents perform, albeit at different levels, some of the same functions performed by the CSDs. First of all, they perform the account providing function. They also perform the settlement function. In the first place, they need to mirror the credits and debits carried out at the CSD level. Alternatively, for individual transactions, they may internalise settlement in which case they do not need recourse to a book entry change in their account with the CSD.

2.2.2 Institutions and service providers mainly related to counterparty clearing and central counterparty clearing

2.2.2.1 Central counterparties

In section 2.1 the two different functions of counterparty and central counterparty clearing were defined. The CCP is directly linked to the function of central counterparty clearing. In consequence, a CCP can be defined as:

¹⁷ Lannoo K and M Levin (2001). "The Securities Settlement Industry in the EU: Structure, Costs and the Way Forward", CEPS Research Report, Centre for European Policy Studies: Brussels.

¹⁸ Depending on the legal environment, CSDs may also provide accounts for investors. For example, in Finland, Greece and Slovenia individuals have accounts directly at CSDs.

An entity that interposes itself, directly or indirectly, between the transaction counterparties in order to assume their rights and obligations, acting as the direct or indirect buyer to every seller and the direct or indirect seller to every buyer.

CCPs have been first introduced in derivative markets and, at least in the EU, only recently in securities markets. Not all securities markets have a CCP. Besides performing the central counterparty clearing function, most CCPs perform also other functions.

One of them is the collateral management function. In order to protect themselves against the risk of default of Clearing Members (CMs), CCPs put in place risk management procedures. They calculate CMs' exposures to outstanding obligations and ask margins against these exposures. To the extent that collateral for margin is provided in marketable assets whose value is subject to change, the value of the collateral may fall short of exposures. Collateral management is the process used to control the correspondence between the value of the collateral and the required margins.

However, the collateral management function does not represent a service which is offered to third parties; it is a function which is instrumental to a safe provision of the central counterparty clearing function.

Similarly to CSDs, CCPs are characterised by economies of scale, economies of scope, and network effects¹⁹. In addition, when accessing CCPs, users incur connection costs. We will look at each of these features in turn.

Economies of scale

In the absence of a CCP, market participants need to use risk-management procedures to protect themselves from counterparty credit risk. Setting up sophisticated risk-management techniques requires significant investments in IT infrastructures. A CCP centralises credit relationships. As a consequence, the introduction of a CCP allows centralising the risk management for the whole market in a single platform and in so doing avoids the duplication of costly investments.

On condition that the market has a critical size, which enables it to absorb the additional costs of a CCP, the above factors explain the economies of scale which are usually associated with a single CCP.

At the same time, the greater the number of transactions for which a single CCP interposes, the more likely these transactions will be of opposite sign. As CCPs usually ask margins on the basis of CMs' net obligations, a greater scale of activity by a single CCP, for a given level of activity in the same instrument, results in fewer margins²⁰. The same arguments apply to transactions in a given financial instrument which is traded on two or more trading platforms²¹ (see below).

¹⁹ In the context of central counterparty clearing economies of scale and scope apply to both physical and financial resources.

²⁰ Suppose that there are only two CMs which enter into two perfectly opposite securities transactions, i.e. same ISIN, same number of securities and same price. Suppose further that CCP1 interposes in the first transaction, while CCP2 interposes in the second transaction. In this hypothetical scenario, both CMs have to pay margins for each transaction. On the contrary, if a single CCP was to interpose in both transactions it would not ask for any margins.

²¹ This term is used to refer to regulated markets and multilateral trading facilities (MTFs) as they are defined in Article 4(1), subparagraphs 14 and 15, of the Directive of the European Parliament and of the Council on markets in financial instruments 2004/39/EC.

As contributions to post-default backing, e.g. contributions to the default fund, typically depend on margin requirements, a greater scale of activity by a single CCP also allows it to ask less post-default financial resources. The interposition of a single CCP therefore minimises the provision of overall financial resources by CMs, which represents a financial cost in terms of lost interest or opportunity cost for the latter. Such cost is minimised if there is a single CCP. Apart from requiring higher financial resources, accessing two CCPs could also entail higher risk²².

Economies of scope

In the context of central counterparty clearing, economies of scope can arise in two broad circumstances: (1) the provision of services for a given financial instrument traded on two or more trading platforms; and (2) the provision of services for several financial instruments.

If a CCP extends the number of financial instruments for which it provides services, it should be able to use its existing platform. In doing so, it may incur some fixed cost, but this cost is likely to be low relative to the initial investment. This is the same as for CSDs.

To the extent that financial instruments are correlated, a CCP can apply cross-margining techniques which reduce the overall margin requirements and are therefore beneficial for the transaction counterparties. Furthermore, some CCPs even calculate margins on the basis of a portfolio system which looks at the change in value of the entire portfolio. Therefore, as long as there is a sufficiently strong and stable correlation between the financial instruments of a diversified portfolio, a CCP could ask lower margins and financial resources in general²³.

This suggests that further economies of scope can be achieved through consolidation of CCPs and the associated counterparty clearing activities across multiple securities and derivatives markets including bond and interest rate derivatives and commodities.

Connection costs

For practically the same reasons that were given in the case of CSDs, accessing a single CCP, as opposed to multiple CCPs, minimises connection costs.

Network effects

As already mentioned, a CCP interposes itself between CMs. In so doing, it assumes the transaction counterparties' rights and obligations. CCP interposition implies that the risk of default of the trade counterparty is substituted with the risk of default of the CCP. Loosely speaking, this substitution makes sense if and only if the risk of default of the CCP is very low. This is what is usually meant when it is said that the CCP provides the guarantee

²² Suppose again that there are only two CMs which enter into two perfectly opposite securities transactions, i.e. same ISIN, same number of securities and same price. In the case where CCP1 interposes in the first transaction, while CCP2 interposes in the second transaction the two CMs are subject to the, presumably low, risk of default of the two CCPs. On the contrary, in the case where a single CCP interposes in both transactions the two CMs do not have, by definition, any exposure towards the single CCP and therefore do not incur any risk of default, however low, of the same CCP. Appropriate risk management or regulation should ensure that this risk be negligible.

²³ Very good examples of correlated financial instruments are purchases and sales of: (i) a stock and a derivative having the same stock as underlying; or (ii) the same financial instrument traded on two or more trading platforms (in this case the correlation is perfect). The case in which two different CCPs interpose in transactions in the same financial instrument on two trading platforms is therefore not different from the hypothetical case described above in which two CCPs interpose between CMs in different transactions on the same trading platform. In both cases, CMs have to accept the interposition of different CCPs for the same financial instrument.

function. The point is that interposition is necessary for the CCP to be able to provide the guarantee. To put it differently, in order to provide the guarantee, both transaction counterparties must use, directly or indirectly, the services of that CCP. The reason why the CCP cannot provide the guarantee to a single counterparty is that, if it were to do it, the CCP positions would not be balanced and therefore the CCP would incur market (investment) risk. On the contrary, by interposing the risk incurred by the CCP is limited to counterparty credit risk.²⁴

Network effects arise because the greater the number of transaction counterparties that use the services of a CCP, the greater the probability that a transaction by a given party will be accepted by the CCP, and therefore the greater the utility for that party to buy the CCP services. Utility is maximised when all transaction counterparties use the services of a CCP. Based on this logic, the use of a CCP, if one exists, is usually compulsory with respect of the instruments which it covers. In such cases the trading platform acts as a coordination device to achieve maximum benefits for its users.

Costs of monopoly provision

Just as in the CSD case, against the possible benefits that can be achieved by CCP consolidation, the potential costs of monopoly provision also need to be considered. Once again, these will obviously depend on the extent to which the entity in question pursues a profit motive. In the worst case, the CCP price could be set such as to deter a significant amount of trading from occurring. A competitive market structure would avoid this problem. To the extent that there is currently little or no competition, on the other hand, there would be no marginal loss from consolidation of monopoly provision at a wider scale (assuming regulatory issues were appropriately addressed), although this does not mean it is the best possible outcome that can be achieved.

It also needs to be borne in mind that as long as markets are segmented, the costs necessary to serve them may be sunk. The full range of potential efficiencies from consolidation may then be hard to achieve, even if consolidation actually occurs. Under these circumstances there is no incremental inefficiency from competition. Moreover, following this line of argument further, it is also the case that even if the EU market were perfectly integrated with a single supplier, welfare gains might be achieved by making markets contestable by providers from third countries which would incur relatively limited incremental costs to enter the EU market.

* * *

The fact that CCPs are characterised by economies of scale, economies of scope and network effects, and that when accessing CCPs users incur connection costs, appears to be consistent with the market structure that can be observed in almost all the Member States (i.e. a single CCP, where one exists).

²⁴ Some clarifications are needed. First, a CCP is subject to further risk than just counterparty credit risk (see Committee on Payment and Settlement Systems, Technical Committee of the International Organization of Securities Commissions, *Recommendations for Central counterparties*, Bank for International settlement, November 2004). Second, it is theoretically possible to imagine a CCP incurring market (investment) risk. However, the price charged to users for incurring this cost is likely to be so high that the corresponding demand is likely to be very low, so low to make the introduction of a CCP not viable.

2.2.2.2 Clearing members

When a trading platform is served by a CCP, the former's members (broker-dealers or others e.g. local traders, commodity producers, banks) have different options. They may be direct members of the CCP, therefore acting as Individual Clearing Members (ICMs). Alternatively, they may use the specialised services of another person – be itself a broker-dealer or not – who is itself a direct member of the CCP; these persons are called General Clearing Members (GCMs). Both individual and general clearing members are direct members of the CCP. In contrast, the exchange member using the services of a third party is an indirect or Non-Clearing Member (NCM) of the CCP.

Both direct and indirect clearing members may be acting on their own behalf or on behalf of their **clients**.

2.2.3 Analysis of the overall trading – post-trading value chain

As we have seen in section 2.2.1, the services offered by CSDs are complementary to each other. Complementarity also exists among the services offered by the main actors present in the trading and post-trading industries, i.e. trading platforms, CSDs and CCPs.

A possible way of organising trading and post-trading activities to take advantage of this complementarity is through vertical integration, under the same ownership, into a so called **vertical silo**. A vertical silo may bring two types of benefits:

- it may facilitate the introduction of Straight Through Processing (STP), i.e. the ability to automate the processing of a securities transaction from beginning to end without manual intervention at any of the intermediary stages;
- it may avoid the problem of double (or even triple) marginalisation²⁵; there are, however, substantial doubts regarding the actual extent of benefits that can actually be achieved in this case. The reason for this lies in the complex nature of the complementarity²⁶ which makes it difficult to correctly estimate the demand for the different services and consequently their profit-maximising price.

In spite of these potential benefits, vertical silos may also have negative implications, because of their ability and incentive to foreclose competition (see section 2.3.2 below).

²⁵ Double marginalisation refers to the situation where two players which operate at different levels of the value chain enjoy a certain market power (i.e. the markets are not perfectly competitive) and have a profit-maximisation motive. The price they will charge will eventually be relatively high, because both players seek to maximise profits and both choose a mark-up (margin) over their own costs. However, in putting its own price at the level where marginal cost equals marginal revenue, each firm fails to take into account the effect that its pricing has on the other firm. Thus, the pricing behaviour of vertically separated entities gives rise to a negative externality. In sum, users pay too high a price and both firms are punished for this because sales are less than optimal. If the two merge into a single entity the latter would be able to charge a lower price, which would allow the entity to earn profits that would exceed the combined pre-integration profits. The same result could, alternatively, be achieved contractually, although this would, of course, introduce contracting costs.

²⁶ The following two examples can be given:

- i) where a CCP exists, its services are a one-for-one complement to trading for liquidity demanders, but consumed in a variable quantity by liquidity suppliers since not all offers to trade actually result in a trade occurring;
- ii) where a CSD settles on a gross basis the net settlement instructions received from a CCP, settlement services offered by the CSD are complementary to both trading and central counterparty clearing, but in a variable proportion to both.

2.3 *Competition considerations*

2.3.1 **Competition in post-trading**

The conclusions drawn from the characteristics of CSDs/CCPs in the previous sections appear to be consistent with the observed fact that in most countries a single CSD/CCP²⁷ serves each market. An important role in determining the present equilibrium in each of the post-trading markets, i.e. the CSD/CCP²⁸ that has become dominant, has been played by trading platforms.

Given the present structure of the post-trading industry in the Member States, the extent of actual competition is non-existent²⁹. Against this background, one may wonder whether there is a sufficient degree of potential competition or, in other words, whether markets are sufficiently contestable.

As it is well known, economies of scale and scope are compatible with perfectly contestable markets. This is precisely the case if production of a given service does not entail any sunk costs. However, this is a very strong assumption as investments made by CSDs/CCPs, both in human and technical capital, are deemed to be very specific and therefore not easily recoverable. Further problems arise from the demand side due to switching costs, i.e. costs that a user incurs when changing CSDs/CCPs.

All this implies that, in each Member State, the markets in which CSDs/CCPs operate are not perfectly contestable. Competition could come from foreign CSDs/CCPs. This is because they already possess the necessary expertise and technical capabilities. Moreover, entering new markets would not entail any duplication of infrastructure costs for them, since the latter have already been borne in the domestic market. However, this is hampered by existing cross-border barriers and, to different degrees, by the network effects which characterise the CSD/CCP activity, making change by a single issuer and/or user not convenient.

Still, the degree of contestability for CCPs seems to be superior to the case of CSDs due to the fact that:

- the barriers applicable to CSDs are much more complex and difficult to resolve than the barriers applicable to CCPs;
- there are differences in how the trading platform acts as a coordination device for CSDs and CCPs. In the case of the CCP, the choice is entirely in the hands of the trading platform. In the case of the CSD, the interaction among different parties is more complicated as it includes the issuers. Even assuming that issuers do have the right to choose where to establish securities in book-entry form, due to network effects, individually they may not find convenient to switch to a different provider. In these circumstances, it may not be efficient, or even possible, for the trading platforms to move away from the existing equilibrium. This seems to be even more so if issuers do not have the right to choose where to establish securities in book-entry form.

As the choice of the CCP is entirely in the hands of trading platforms, the latter could, although they not necessarily will, periodically put the CCP service out to tender (this is so

²⁷ In the case of the CCP, there may not even be one.

²⁸ With respect to securities, trading platforms also choose whether to use a CCP at all.

²⁹ In the case of CSDs it has been argued that the fact that custodians/settlement agents can internalise settlement, i.e. they are big enough to be able to settle transactions on their books, without the need to access their accounts at the CSD, means that there actually is competition in the market. However, there appears to be no evidence that internalisation of settlement represents a net competitive constraint on the pricing of a CSD.

called "competition for the market"). Markets have the incentives to choose the most efficient CCP, i.e. the CCP that applies the lowest prices or offers the best services. This is true independently of the degree of competition at the trading level. Even where trading is not subject to competition and therefore the market enjoys considerable market power, it would not be in its own interest to allow further mark-ups along the value chain given that double marginalisation is privately inefficient. Following the tendering process, the market and the chosen CCP would agree on a contract, which would specify, for a given time period, the pricing structure, along with the offered services, to be applied by the CCP to its participants.

However, even though less complex than the barriers applicable to CSDs those applicable to CCPs make the tendering process for CCPs less than optimal. Besides the technological barrier, which is linked to the already mentioned switching costs, further potential barriers are (i) divergent regulatory regimes and (ii) different business models adopted by existing CCPs.³⁰ Moreover, an effective transfer to another CCP would require the novation or substitution of outstanding open positions with the incumbent CCP. Such transfers would inevitably take some time and entail some costs.

2.3.2 The role of post-trading infrastructures in the competition between trading platforms³¹

Trading platforms can use providers of post-trading services to foreclose competition in trading services. Before analysing this aspect any further, a short introduction on trading platforms in the EU is necessary.

The main EU platforms for trading stocks are London Stock Exchange (LSE), Euronext and Deutsche Börse which represented respectively 40%, 19% and 12% of the value of equities traded in EU25 in 2004 (revenues and market capitalisation give reverse rankings).

So far, trading platforms have functioned as quasi national monopolies and the competition between them is almost inexistent. Where there has been competition, users seem to have benefited; for example the trading services offered by LSE for Dutch cash equities is perceived as continuing to exert a competitive constraint on Euronext, the incumbent trading platform, resulting in lower costs for many users³². In the non-regulated market, there is likely to be more competition. Multilateral Trading Facilities (MTFs) offer lower transaction costs and easier cross-border trading. In the equity arena, MTFs are believed to have limited market share (although data on this is lacking), but they are much more important for bonds. The Markets in Financial Instruments Directive (MiFID), directly encourages competition in trading. Available evidence, although it may be thin, all points to benefits from such competition both for fees and for market efficiency.

Trading platforms can protect their business from competition directly (e.g. by reducing fees or other behaviour) or indirectly by making access to post-trading arrangements difficult or impossible for a competitor. It is this influence over post-trading by trading platforms which determines to a large extent the potential for competition to develop in trading and post-trading.

³⁰ The precise functions carried by each CCP vary from one context to another. For instance, as regards securities, LCH.Clearnet SA establishes settlement positions on a net basis, while CC&G outsources this task to RRG, the verification system operated by Monte Titoli.

³¹ The analysis in this section is based on Friess and Greenaway *"The Competition in EU trading and post-trading service markets"*, forthcoming.

³² See Foucault T. and Menkveld A. J. *"Competition for order flow and smart order routing systems"*, 2005.

For competition between trading platforms to develop, a variety of conditions need to be met. These include access to, and fungibility, in central counterparty clearing, i.e. that the positions of a single member on both platforms can be offset against each other to produce a single collateral position and a single position for settlement. If this condition is not met, the attractiveness of the second platform diminishes.

When the CCP or the CSD (or both) is owned by an incumbent trading platform which is under no legal obligation to provide access outside competition law, it does not seem very likely that it will voluntarily do so on non-discriminatory terms. This is because the entrant will compete head-on with the incumbent. Provided that entry does not significantly increase the size of the market, competition is likely to be on price terms, thus destroying industry profits. If the entrant is more efficient, it might even oust the incumbent entirely.

As a consequence, a vertically integrated structure, e.g. a vertical silo, has both the means and the incentives to foreclose competition. Even if a new entrant could try to use an alternative CCP, he has no chance to avoid the incumbent CSD whilst the incumbent has every incentive to concentrate rent capture there.

When the CCP is completely independent and either run for profit or user-owned, it has an incentive to enable entry at the trading level and offer fungibility, because by doing so it alters the bargaining power in its favour, or in its users' favour if users own it. This is because, where there is a single player at each level, it is the trading platform which typically has the strongest bargaining power in capturing the available monopoly rents. Indeed, when a CCP offers its services to a single trading platform, it is the latter that has the greatest bargaining power. On the other hand, when there are alternative trading platforms, the threat of the primary platform replacing the CCP is much less existential, since users with a vested interest in not changing CCP (because, for example, they use the same provider on other markets, or have incurred high sunk costs in interconnecting systems) can more credibly threaten to switch all or part of their trading to the alternative platform.

However, even when the CCP is independent, it may not be free in its actions. This is because it can invite entry only when it enjoys incumbency. However, in order to attain incumbency, it must be awarded it by the trading platform. The latter, therefore, can and has an incentive to, specify contractual conditions which exclude fungibility or, at the very least, render it more difficult to achieve.

3 THE CURRENT SITUATION

In spite of the fact that safe and efficient post-trading arrangements are essential for the overall functioning of financial markets, there are many obstacles that prevent the full emergence of such arrangements at the EU level. Some of these obstacles are technical, others are behavioural. However, in the process of creating the conditions which will allow the necessary changes for financial integration to occur, the industry is not united. On the contrary it is characterised by the presence of conflicting interests among the various participants in post-trading and lacks a recognised leader that could unite these participants behind a common position, whilst at the same time wishing to restrict public sector intervention to a limited number of legal and fiscal issues.

3.1 Access channels to CSDs and CCPs in a cross-border context

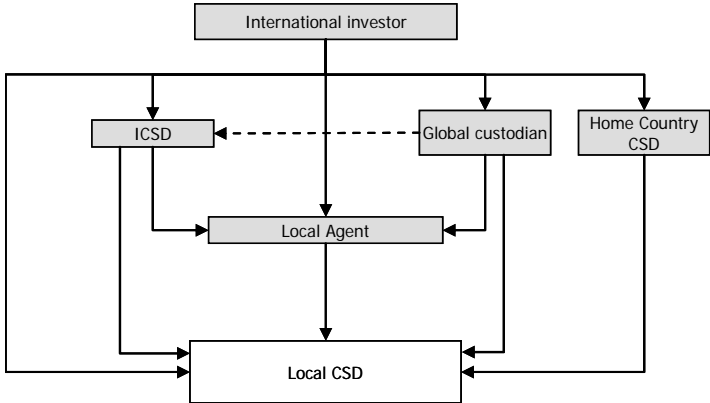
The EU post-trading industry is composed of national-based systems that tend to be monopolistic (the only exceptions are the two ICSDs), i.e. all trades in a given type of security are cleared and settled by a single national entity. At the national level, the various post-trading systems have evolved differently, reflecting on one hand the historical evolution of the different national financial systems, which was in turn driven by specific national requirements (technical and legal) and preferences (cultural and socio-economic). On the other hand they reflect an economic rationale, which has favoured monopoly provision of post-trading services as the means to maximise economies of scale (and often also scope) (see chapter 2 for more details).

In the next section, we will briefly touch on the barriers to efficient cross-border post-trading. Prior to that, it is useful to remind the possible channels to CSDs and CCPs in a cross-border context.

Cross-border transactions can be settled through the following channels (see figure 2 below):

- 1) direct remote access to the issuer-CSD (Giovannini channel 1);
- 2) use of a custodian having direct or indirect access to the issuer-CSD; the custodian may either be a local agent (Giovannini channel 2) or a global custodian (Giovannini channel 3);
- 3) use, as an intermediary, of an (I)CSD (Giovannini channels 4 and 5) that has direct or indirect access to the issuer-CSD.

Figure 2: Channels for cross-border settlement



Source: Giovannini Group (2001)

In a cross-border context, CSDs may offer direct services to remote participants in relation to securities they have established in book-entry form (option 1 above). The CSD which has established securities of a certain issue in book-entry form and which provides the account is often referred to as **issuer-CSD** for that issue.

As already mentioned in chapter 2, **custodians and settlement agents** typically act as intermediaries for settlement activities. They act in this capacity with respect to cross-border settlement as well (option 2 above). While investors typically access the issuer-CSD through a local agent or a global custodian, broker-dealers typically access the issuer-CSD through a local settlement agent, that is without the intermediation of a “global settlement agent”. The reason for this is that broker-dealers need a prompt access to information regarding the state of transactions – whether or not they have been settled – which is better achieved without the further level of intermediation of a hypothetical global settlement agent. These intermediaries have sometimes a pivotal position (due to costs for shifting the business towards another intermediary, i.e. so called switching costs) and are therefore able to claim a certain market power.

CSDs may also act in an intermediary capacity in relation to securities established in book-entry form in the issuer-CSD (option 3 above), by holding an account with the latter. The CSD that holds an account with the issuer-CSD is often referred to as **investor-CSD**.

In the provision of cross-border settlement services, therefore, CSDs, acting in their intermediary capacity, and the custodians and settlement agents are, at least potentially, in competition with each other. The possibility for the issuer-CSD to offer direct remote access means that it can also, at least potentially, compete with the investor-CSDs and the custodians and settlement agents in the provision of cross-border settlement services. In order to allow such competition, access to issuer-CSD should be granted to other CSDs.

Box 2: Cross-border settlement of collateral operations provided by Eurosystem counterparties

Eurosystem counterparties may use eligible assets on a cross-border basis, i.e. they may obtain funds from the National Central Bank (NCB) of the Member State in which they are established – the home NCB – by making use of assets located in another Member State.

There are two channels by which cross-border use of eligible assets may be achieved. The first is the so-called Corresponding Central Bank Model (CCBM), the second is the use of eligible links between CSDs³³.

In the first case, all NCBs maintain securities accounts with each other for the purpose of the cross-border use of eligible assets. Through these securities accounts, NCBs act as custodians (correspondent) for each other. If a bank wants to provide to its home NCB eligible assets located in another Member State, the CSD where securities are located needs to transfer those securities to its NCB – the corresponding NCB – for the account of the home NCB. The home NCB will hold the securities provided as collateral through the corresponding NCB.

In the second case, the home NCB has a relation with its national CSD which in turn has a link (i.e. it has opened an omnibus account) with the CSD where securities are located. While in the CCBM, the cross-border relationship is between NCBs, using the link the cross-border relationship is between CSDs.

While in the case of CSDs, the issuer-CSD establishes securities in book-entry form, typically through a relation with issuers, a CCP typically has a relation with the market for which it provides central counterparty clearing services. We will call this CCP the **market-CCP**.

³³ According to data published by the ECB (<http://www.ecb.int/stats/payments/securities/html/coll4.en.html>) roughly a third of all cross-border collateral operations provided to the Eurosystem were carried out through the CCBM channel in 2004, while less than 10% were carried out through links.

As for the domestic context, broker-dealers may access the market-CCP directly, as Individual Clearing Members (option 1), or through General Clearing Members (option 2). Moreover, in the cross-border context, broker-dealers could, in principle, also use the services of another CCP, acting as **investor-CCP**, which is a member of the market-CCP (option 3).

3.2 A nationally segmented post-trading industry

As already mentioned in chapter 1, the EU post-trading industry is segmented along national dimensions: while generally efficient and safe within national borders, the various systems "combine" and communicate less efficiently and (potentially) less safely across the border. This state of affairs results in higher costs and higher risks for cross-border as compared to domestic securities transactions.

In order to offer an explanation for the EU market segmentation, the first Giovannini Group Report, published in 2001, identified fifteen barriers preventing the integration of the post-trading industry at the EU level. The barriers were categorised and related to (i) technical requirements/market practice, (ii) tax procedures, and (iii) legal certainty.

Table 1: The Giovannini Barriers

Type	Barrier
Technical requirements / market practice	Diversity IT platforms/interfaces Restrictions on the location of clearing and settlement National differences in rules governing corporate actions Differences in availability/timing of intra-day settlement finality Impediments to remote access National differences in settlement periods National differences in operating hours/settlement deadlines National differences in securities issuance practice Restrictions on the location of securities Restrictions on the activity of primary dealers and market makers
National difference in tax procedures	Withholding tax procedure disadvantaging foreign intermediaries Tax collection functionality integrated into settlement system
Legal certainty	National differences in the legal treatment of securities National differences in the legal treatment of bilateral netting Uneven application of conflict of law rules

Source: Giovannini Group (2001).

The existence of the barriers and the consequent use of intermediaries³⁴ results, however, in much greater complexity than in corresponding domestic transactions. This increase in complexity can be best highlighted through the stylised examples of a domestic and a cross-border equity transaction as cited in the first Giovannini Report. Based on these examples, a domestic equity trade involves two intermediaries, which handle six instructions. In contrast, a cross-border trade involves an additional five intermediaries, which handles an additional

³⁴ This does not, however, mean that such arrangements are not efficient under the given circumstances. For example, the fact that an institutional investor uses a local agent to access a CSD instead of opening an account directly indicates that the former solution is more cost efficient. Local agents may also provide the necessary local expertise in terms of legal and tax issues and other value-added services.

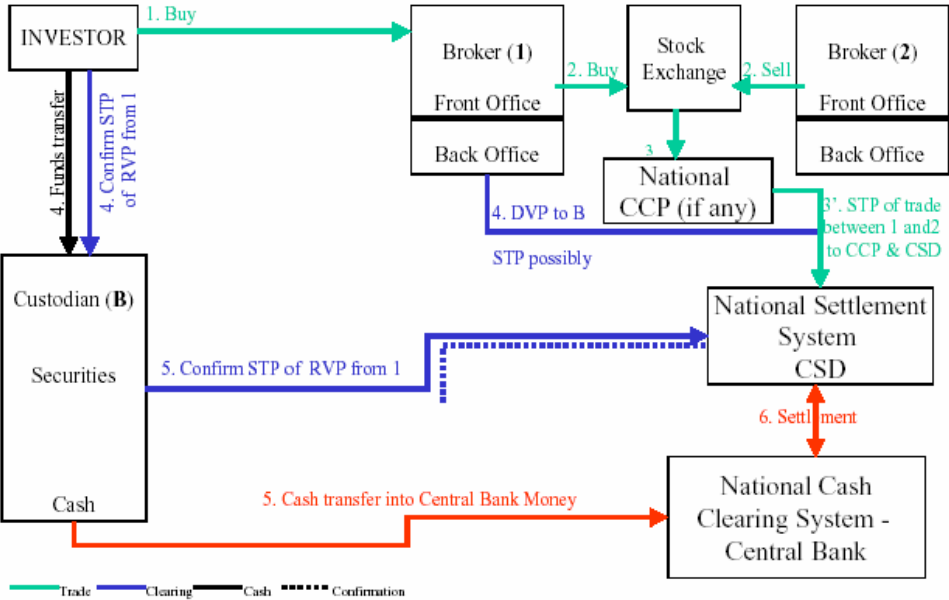
nine instructions (see Box). A quick glance at the respective flow charts (see Figure 3 and Figure 4) is enough to see why current post-trading arrangements put the EU financial sector at a disadvantage relative to the various financial sectors in EU Member States, not to mention those in the United States and Japan.

Box 3: Intermediaries and Instructions in domestic vs. cross-border transactions

Two intermediaries are involved in a domestic transaction (1) an investor’s broker and (2) the investor’s custodian bank, handling six instructions, namely (i) the investor’s order to trade, (ii) the trade itself, (iii) the custodian notification of the trade by the investor and (iv) the equity delivery to the investor’s custodian banks as well as the custodian bank’s (v) confirmation of the equity receipt to the investor and (vi) the delivery of cash to pay for the transaction.

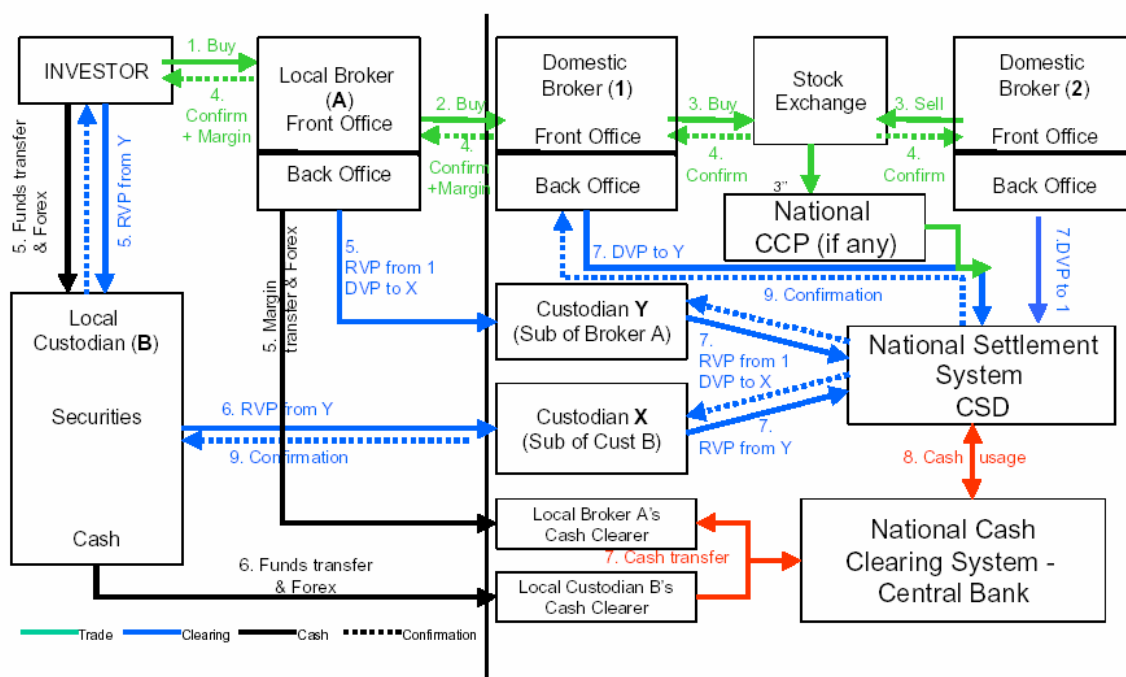
In addition to those involved in a domestic transaction, a cross-border transaction requires five additional intermediaries, namely the local broker’s (3) foreign country correspondent broker, (4) the local broker’s foreign country custodian and (5) the local broker’s cash clearer. Moreover, the local custodian will need (6) a foreign country custodian and (7) another cash clearer. An additional nine instructions are needed in a foreign transaction, namely (vii) the forwarding of the investor’s order from the local broker to the correspondent foreign country broker, (viii) after the trade, the local broker instructs his foreign country custodian to receive the equity from the foreign country broker, and (ix) to deliver it to the local custodian’s foreign country custodian. The local broker has also (x) to arrange the margin transfer (and the foreign exchange conversion) via the local broker’s foreign country cash clearer and the foreign country cash clearing system. The local custodian has (xi) to instruct its foreign country custodian to receive the equity from the local broker’s foreign country custodian and (xii) to transfer the investor’s funds for payment to the local custodian’s foreign country cash clearer. After receiving the equity from the counterparty, the foreign country broker (xiii) delivers the equity to the local broker’s foreign country custodian, who in turn delivers it to the local custodian’s foreign country custodian. Finally, (xiv) the foreign country cash clearer of the local custodian transfers the investor funds to the foreign country cash-clearer of the local broker, which in turn (xv) transfers the funds for payment to the foreign country CSD.

Figure 3: Instruction flows in Domestic Equities Transaction



Source: The Giovannini Group (2001)

Figure 4: Instruction flows in a Cross-border Equity Transaction



Source: The Giovannini Group (2001)

3.3 The consolidation of the EU post-trading industry

Since the introduction of the euro, there has been considerable consolidation activity in the post-trading industry (see table 2). A lot of the consolidation has taken place within the borders of Member States themselves, but some cross-border activity could also be observed.

Table 2: The reshaping of the post-trading industry after the introduction of the euro.

Country	CCP		CSD	
	January 1999	January 2006	January 1999	January 2006
Belgium	BELFOX (derivatives)	LCH.Clearnet SA	NBB-SSS CIK Euroclear	NBB-SSS Euroclear Belgium (former CIK) Euroclear Bank
Germany	Eurex Clearing (derivatives)	Eurex Clearing (derivatives, repos, securities)	Deutsche Börse Clearing (DBC)	Clearstream Frankfurt (former DBC)
Greece	ADECH (derivatives)	ADECH (derivatives)	BOGS CSD SA	BOGS CSD SA
Spain	MEFF Renta (derivatives on debt instruments) MEFF Renta Variable (derivatives on equities)	MEFF Renta (repos, government bonds, derivatives on debt instruments) MEFF Renta Variable (derivatives on equities)	CADE SCLV Espaclear SCL Bilbao SCL Barcelona SCL Valencia	Iberclear SCL Bilbao SCL Barcelona SCL Valencia
France	Bourse de Paris (SBF) (equities and options) Matif (derivatives, subsidy of SBF) Clearnet (repost, government bonds, subsidiary of Matif)	LCH.Clearnet SA (derivatives, repos, securities, also for MTS)	Sicovam	Euroclear France (former Sicovam)
Ireland	None	None	CBISSO NTMA	NTMA
Italy	CC&G (derivatives)	CC&G (derivatives, securities, also for MTS Italy and EuroMTS)	Monte Titoli CAT LdT	Monte Titoli
Luxembourg	None	None	Cedel	Clearstream Luxembourg (former Cedel)
Netherlands	Effectenclearing (securities) EOCC (derivatives)	LCH.Clearnet SA	Necigef	Euroclear Nederland (former NECIGEF)

<i>Austria</i>	Vienna Stock Exchange (derivatives)	CCP Austria (derivatives, securities)	OeKB	OeKB
<i>Portugal</i>	BVL (derivatives)	LCH.Clearnet SA	Interbolsa SITEME	Interbolsa SITEME
<i>Finland</i>	HEX (derivatives)	OMX Clearing (derivatives)	APK	APK
<i>Denmark</i>	None	None	VP A/S	
<i>United Kingdom</i>	London Clearing House	LCH.Clearnet Ltd		CRESTCo
<i>Sweden</i>	OMX Clearing (derivatives)	OMX Clearing (derivatives)	VPC	VPC

Source: Financial Stability Review, December 2005, ECB.

The following subsections give a more detailed account of the three major cross-border consolidations that took place in the last years.

3.3.1 Euroclear

The process of cross-border CSDs consolidation driven by Euroclear started in January 2001, when Euroclear Bank merged with Sicovam SA (the French CSD). Later on, mergers with NECIGEF BV (the Dutch CSD; in May 2002), CRESTCo (the CSD for the UK and Ireland; in September 2002) and most recently CIK (the Belgian CSD; in January 2006) were completed.

The Euroclear Group is 86.9%-owned by its users, while the remaining stake is owned by Sicovam Holding SA.

Since the beginning of 2003 Euroclear has been busy with the implementation of its business model, which entails the consolidation of technology platforms across the Euroclear group. The implementation is envisaged in two phases.

In a first phase the Single Settlement Engine (SSE) will target settlement of cross-border transactions across the various group entities on an internal book-entry basis. The SSE will replace current group (I)CSDs' core settlement applications.

As an important intermediate step towards the creation of a single transaction-processing platform for the Euroclear group, ESES (Euroclear Settlement for Euronext-zone Securities) will offer a harmonised settlement platform for the straight-through processing of trades from Euronext's single order book for both local and remote Euronext members. The initiative will provide clients with a single access point of their choice to settle trades conducted on any of the Amsterdam, Brussels and Paris segments of the Euronext exchange.

The SSE will be launched this year. In order to ensure a smooth implementation, the SSE will be launched in phases, starting with Euroclear France (29 May), followed by CRESTCo (7 August) and Euroclear Bank (27 November). Euroclear Nederland and Euroclear Belgium will migrate to the SSE later, as part of ESES.

The second phase aims to bring the complete consolidation of all group (I)CSDs' systems – under the Single Platform - and a Common Communication Interface (CCI) for all users of the group. The conclusion of this phase is foreseen for the year 2010.

3.3.2 The Nordic Central Securities Depository (NCSD)

The second example of CSD consolidation comes from the Nordic region. In April 2004 VPC AB and OM HEX AB announced a merger between the OM HEX-owned Finnish CSD (APK) and VPC, its Swedish equivalent, thereby creating a strong joint CSD group within the Nordic area, the Nordic Central Securities Depository (NCSD). The merger was completed in December 2004.

Following the merger APK is 100% owned by VPC who is in turn owned by four banks and OMX AB (each with a 19.78% stake).

Both entities are still operating in their own right at a holding company level³⁵. They are still working off two separate systems (each serving its own market), which are scheduled to be integrated into a single platform³⁶. A consolidated NCS D platform is not expected to be implemented until 2008 at the earliest. The NCS D is currently consulting with the different parties involved in clearing and settlement to develop the single platform.

3.3.3 LCH.Clearnet

LCH.Clearnet is the only example of cross-border CCPs consolidation in.

LCH.Clearnet is the product of a series of mergers. First, in 2001, Clearnet SA merged the French, Dutch and Belgian CCPs in order to provide integrated clearing services to Euronext markets (Paris, Amsterdam and Brussels). Clearnet SA was controlled (80%) by Euronext, with Euroclear having the remaining stake (20%). After the merger of Euronext and the Lisbon market in 2002, Clearnet SA took over also the clearing services of the Portuguese market.

In a second step Clearnet SA and London Clearing House Ltd (LCH), which was owned by its users, merged³⁷ to form LCH.Clearnet Group Ltd – a holding company that wholly owns the newly renamed LCH.Clearnet SA and LCH.Clearnet Ltd.

As a consequence of the latter merger the ownership structure of LCH.Clearnet Group Ltd is as follows:

- Euronext: 45.1% (voting rights are capped at 24.9%);
- Euroclear: 9.8%;
- old users of London Clearing House Ltd: 45.1%.

The two entities continue to remain separate both in their operations and in their clearing platforms. This means that only the Clearnet leg of the consolidation process represented a true integration, while the subsequent merger with LCH so far does not. While LCH.Clearnet SA provides clearing services for the Euronext markets (in addition it clears trades for other providers, in particular for debt securities and repos), LCH.Clearnet Ltd provides them for the London Stock Exchange, Euronext.LIFFE (derivatives), the London Metal Exchange, ICE Futures and virt-x.

According to the latest available information, the Group does not want, for the time being, to harmonise the clearing platforms for the fixed income businesses. It has, however, started the harmonisation plan for cash equity, which is in its consultation phase (unfortunately a calendar of the harmonisation process does not seem to be publicly available). For exchange traded and commodity derivatives, due to the complexities of existing systems and processes, integration is anticipated in 2007/8. Notwithstanding this, a harmonisation project has been started in 2005 looking for the harmonisation of activities and services that do not require major changes to systems or face regulatory issues.

³⁵ However, business operations are conducted under the brand name NCS D Group.

³⁶ According to news reports, the introduction of the common technology platform may spark some controversy as both APK and VPC introduced new separate platforms at the end of 2003 at significant expense to their respective owners and participants.

³⁷ The merger was announced on 25 June 2003 and completed on 22 December of the same year.

3.4 Co-ordinating actions in the presence of conflicting interests

In spite of the many reports, recommendations and regulatory initiatives in the area of post-trading in recent years (see chapter 1 for details) and heightened consolidation activity in the industry following the introduction of the euro, the general consensus is that the progress in removing the barriers has been so far slow. Some of the deadlines³⁸ set in the second Giovannini report have already passed, while the remaining ones are fast approaching and few, if any, of the barriers have been conclusively removed so far.

Why are things not proceeding more quickly? How can the various actors involved justify this slow progress given abundant theoretical and empirical evidence of the benefits brought about by integration/consolidation in the post-trading industry? The reasons lying behind this slow progress are many, and are mostly tied to the complexity of the issues that are being tackled, the number of actors involved and their conflicting interests, which lead to disagreement regarding both what the final solution should look like and, most importantly, how to get there.

3.4.1 Conflicting interests

Generally speaking, the various players present in the industry may be grouped into two categories: those in favour of the status quo (and thus opposed to integration/consolidation) and those in favour of reform.

Opposition to reform is principally caused by the fact that the costs and benefits originating from integration/consolidation may be distributed unevenly across the various market participants. For example, it may happen that certain providers may incur high costs during the integration process, because they currently gain from the complexity of the system and would therefore lose business (or, in the extreme case, be pushed out of business) in case those complexities disappeared.

However, when the Commission consults with the different actors, only a few of them, if any, are openly opposed to reform, presumably due to the evidence on the benefits that the latter would bring. This makes it very difficult, if not impossible, to frame the debate between those in favour and those opposed to integration/consolidation. Instead, the main source of controversy seems to be how to achieve integration/consolidation.

An additional degree of complication is added by the fact that over time, the respective roles of the various players in the industry have become increasingly blurred, since all market players are now seeking to provide new services and/or to reach new markets. This means that many players have become a potential competitor to all the others, making it difficult to clearly identify the incentives faced by each actor in the integration/consolidation process.

3.4.1.1 Roles of shareholders, management and users

Many trading platforms have been demutualised. Users, who used to be owners of the entities with the greatest decision making power over post-trading facilities, now find themselves outside the official channels of influence, unless specific provisions have been made for user representation and even then this may not always be satisfactory. The management of the trading platform has the dual role of responsibility to its shareholders and to its users. As long as competition remains limited, users have no choice in the location of trading and post-trading so management priority may tend towards rewarding shareholders more than users. Where post-trading is part of the same corporate entity management has some margin in

³⁸ However, these deadlines were acknowledged to be aggressive at the time of their setting.

organising the distribution of costs and revenues to maximise total profits. Even where the trading platform does not own the post-trading facilities, financial flows determined by contract can tie CCPs to the platform to the overall detriment of users.

Users do not demonstrate full determination in their efforts to obtain reductions in all-in trading costs. In reality, detailed knowledge of these is relatively limited because (i) in most cases direct costs represent only a small part of users' overall operational costs which are totally passed on to final investors and (ii) opacity rather than transparency characterises the fees charged by each level of the trading value chain.

If information on trading and post-trading costs were to be more transparent and comparable, users would be more easily able to evaluate cost-benefits of different trading locations. In their turn final investors would be able to require greater transparency from intermediaries as to what services the fees charged actually remunerate.

3.4.1.2 Points of debate

The debate among the various market participants is focused on the following issues:

- access rights;
- governance measures (e.g. unbundling of services, separation of "core" and "non-core" activities, legal/accounting separation);
- final structure of the market;
- the appropriate approach – functional, risk-based functional or institutional – to financial stability and investor protection regulation.

The summaries of the opinions of market participants regarding most of these issues are presented in the next chapter.

4 THE COMMISSION'S OVERALL APPROACH AND OBJECTIVES

4.1 *The April 2004 Commission Communication*

In 2002, the Commission decided to take up the issue of post-trading³⁹ with a first consultative Communication, which was followed by a more policy oriented Communication in April 2004. In its second Communication, the Commission confirmed its interest in this sector and its belief that action at an EU level would be necessary. The document set out the objectives that the Commission would pursue as well as the practical initiatives that it considers necessary to adopt.

The main objective of the Commission would be to foster an EU-wide securities post-trading environment which is efficient and safe and which ensures a level playing field among the different post-trading service providers.

The Commission considered that this objective could best be achieved through a policy of liberalisation and integration of the EU post-trading environment, which should also ensure the safety of systems and the protection of investors. The process of integration should be closely and constantly monitored by competition authorities in order to avoid, among other things, that anti-competitive behaviour results in inefficient structures and arrangements.

In more concrete terms, the Commission proposed the pursuit of four different, closely interconnected and mutually necessary policy components, namely:

- the **liberalisation and integration of existing securities clearing and settlement systems** by introducing comprehensive access rights at all levels and removing existing barriers to cross-border post-trading;
- the **continued application of competition policy**, addressing restrictive market practices and monitoring further industry consolidation;
- the adoption of a **common regulatory and supervisory framework** for achieving a level playing field, ensuring financial stability and investor protection and leading to the mutual recognition of post-trading systems;
- the implementation of **appropriate governance arrangements** for addressing ex-ante some of the public authorities' concerns regarding competition and safety of post-trading systems;

To the Commission, these policies constitute a coherent and interdependent whole. Through their combined effects these policies attempt to foster efficiency and safety throughout the EU at different levels and from different angles in order to avoid any imbalances or indirect and unwanted preferences on particular models, structures or approaches.

The first policy component concerns the liberalisation and integration of the sector. This would entail the creation of an environment where all potential market participants, with the same relevant characteristics, (a) face the same set of rules (technical, legal, practical etc.) when they deal with particular post-trading services, (b) have equal access to these services

³⁹ We replaced the term "clearing and settlement" that was originally used in the Communication with the term "post-trading". This change reflects the need to stay coherent with the rest of the chapters of this document and does not in any way change the substance of the Communication.

and (c) are treated equally when they are active in the market, and this regardless of the location of the user or provider of these services⁴⁰.

This policy would enable access to post-trading services to be available to all actors in the chain of investment intermediation (e.g., access by banks, infrastructure service providers etc.). In turn, this will provide investors (retail and wholesale) with an increased availability of intermediated post-trading channels, irrespective of the location of the intermediation.

The two Giovannini reports provided the Commission with a clear and stylised enumeration of differences between national systems, which act as barriers to integration in the sector. In view of the number and the different nature of these barriers, the Commission suggested that a policy aiming at overcoming them and achieving an integrated market would need to combine a multitude of actions.

The removal of barriers resulting from differences in the way markets operate (e.g., differences in technical procedures, business practices etc.) should be entrusted to the private sector. The Commission is mainly to play a role of catalyst and coordinator in that process.

On the contrary, the removal of barriers resulting from differences of the legal and fiscal compliance environment would be the responsibility of the public sector. In that area, the Commission suggested that it might have an important role to play, probably through the proposal of an EU legislative act. However, the analysis of the issues and the discussions on possible solutions was not advanced enough, so a concrete policy choice could not be made at that stage. For this reason, the Commission suggested that the barriers of this nature be further considered before a concrete proposal for substantive action could be made.

As to the access of market participants to post-trading services, the Commission approached it from two different angles. The first tackles the necessity for legal rights of access. This issue has partly been addressed by the MiFID, to the extent that it grants investment firms the right to access foreign post-trading systems remotely on terms which do not discriminate them against local participants. The Commission considered that its integration policy would need to extend such rights to infrastructure service providers, such as CCPs and CSDs, as well.

However, the Commission also noted that national restrictions on access often reflect the legitimate interest of national regulators/supervisors and overseers to safeguard the safety of the systems they supervise and the overall financial stability of their markets. Granting an EU-wide right of access to entities located in the EU could not provide an appropriate or sufficient response to meet these legitimate concerns.

The Commission suggested therefore that in order to meet those concerns, it will be necessary for entities providing post-trading services in the EU to comply with certain harmonised minimum regulatory requirements, which would also address safety and investor protection issues. Complying with such a regime would result in these entities obtaining a “passport”, which would enable them to offer cross-border services in the EU to the satisfaction of the various national authorities concerned. Under this framework, the entities concerned will have equal access to post-trading services in all member States in the EU and they will be treated equally when they are active in the market.

The Commission was however aware of the fact that the process of liberalisation and integration as described above would inevitably provoke changes to the way post-trading is

⁴⁰ Schmiedel and Schönenberger “*Integration of securities market infrastructures in the Euro area*”, ECB occasional paper series, No 33, July 2005 and Baele, Ferrando, Höhrdahl, Krylova, Monnet “*Measuring financial integration in the euro area*” ECB occasional papers series, No 14, April 2004.

conducted at present and to the relative position of the various actors in the sector. For this reason, the Commission considered as an essential part of its policy to ensure a close monitoring of market practices in that area. Otherwise, the goal and the efficiency gains that it sought to attain through these measures might be frustrated by anti-competitive actions by market participants, especially dominant players. The Commission proposed therefore that (a) the Commission and Member States authorities should strive for the vigorous enforcement of existing competition laws and that (b) certain transparency measures need to be introduced in order to facilitate the supervision and assessment of the behaviour and pricing policy of dominant players. These measures would take the form of governance rules that had to be applied by both CCPs and CSDs.

With these considerations in mind, the Commission suggested that it intends to:

- a) **set up an Advisory and Monitoring group** (the “CESAME” group) in order to assist the private sector in tackling all Giovannini barriers for which the private sector has sole or joint responsibility;
- b) **propose a Directive on Clearing and Settlement** to ensure that restrictions and barriers concerning the location of post-trading are lifted and that the various national systems are mutually recognised throughout the EU. In substance, the directive would introduce access rights to CCPs and CSDs, a common regulatory and supervisory framework on post-trading and governance rules applicable to CCPs and CSDs;
- c) **address the legal and fiscal compliance issues** by setting up of two expert groups (the “Legal Certainty” group and the “FISCO” group) to evaluate the situation and, if needed, to suggest methods of harmonisation of national law and/or procedures.
- d) **ensure the effective implementation of competition law.**

The following table provides a schematic overview of the interdependencies of objectives and the measures proposed.

Table 3: The interdependencies of objectives and measures proposed

Objectives		Specific objectives	Policies and measures	Rationale	Practical initiatives
Efficiency	Level playing field	Integration	Ex-post competition policy	Tackle abuses of dominant positions, including discriminatory practices	Investigations and decisions by the Commission and national competition authorities
			Dismantling of market, legal and fiscal barriers	Liberalisation of the cross-border distribution of post-trading services, increase of competition and cost reduction	CESAME group (market barriers)
					Legal Certainty group (legal barriers)
					FISCO group (fiscal barriers)
			Directive (access and location issues) - To be tested in the RIA		
Ex-ante competition legislation	To increase pricing and cost transparency as a means to make the detection of possible abuses of market power, and therefore distortions of competition by CSDs/CCPs, easier.	Directive (governance rules, i.e., account separation and unbundling of services) - To be tested in the RIA			
Safety		Financial stability and investor protection	Common regulatory and supervisory framework	Facilitate the integration of systems. Addressing the issue of diverging treatment of similar concerns by national authorities	Directive -To be tested in RIA
				To increase financial stability and investor protection.	

4.2 Responses to the Communication

The Communication and the policy guidelines it contained were commented by a number of interested parties (see Box 3 below).

The great majority of the respondents approved the Commission's overarching objective and the necessity for both the private and the public sector's involvement and cooperation in achieving it. In that context, there was overwhelming support for the creation of the three expert groups proposed by the Commission. It also transpired from the responses that the composition of these groups, as proposed by the Commission, was perceived as being able to ensure not only expert advice on the specific issues covered by their mandate, but that they would also ensure a substantive private sector input into the further developments of Commission policies in this area.

All in all, there was also wide support for the policy mix that the Commission proposed, although differences of opinion, regarding the weight that the Commission should give to each of the proposed policy measures and their exact content, were discernible.

Box 3: Breakdown of the responses to the Communication

82 responses were received from a total of 88 respondents have been categorized as follows:

Asset Management Associations	4
Banking/Investment Firm Associations	20
Individual Banks/Investment Firms	14
CCP	1
CCP Association	1
CSD	3
CSD Association	1
Exchanges/Regulated Markets/MTFs	4
Exchanges/Regulated Markets/MTFs association	1
Vertical Silos	5
Governmental Authorities/Central Banks/Supervisory Authorities	25
Issuer Associations	3
Representatives of the legal community	3
Registrar	1
Provider of Matching Services	1
Private Individual	1
Total	88

73 responses have been made public with the express approval of their authors, the rests either they did not provide authorisation or expressly refused it.

4.2.1 Directive

In its Communication, the Commission proposed the adoption of a Lamfalussy-type high-level directive to address the issue of the rights of access, the common regulatory and supervisory framework and the governance issues. The main point of discussion was whether such a directive was necessary or desirable and what would its likely contents be.

In essence, there has been a strong support for the idea of a post-trading Directive, as long as it remained a framework directive dealing with high-level principles. Even the respondents who opposed the adoption of a Directive considered that if, in the end, a decision is taken that a Directive is needed, the latter should be a high-level one.

It is also significant that the great majority of supporters of a Directive consider that access rights and a common regulatory and supervisory framework would be its indispensable

elements. The imposition by the Directive of specific governance obligations (unbundling and accounting segregation) on infrastructure service providers was supported mainly by the banking sector, but not by the intended targets of the measure. Some respondents even suggested additional contents for the Directive, like the imposition of a clear separation between “banking” and “infrastructure” activities.

More particular comments on the three elements of a possible future directive are given below.

4.2.1.1 Rights of access

Respondents, by and large, supported the need for comprehensive access rights in the EU as a mean to overcome current difficulties in accessing foreign markets.

However, for a number of respondents, it is only necessary to ensure the rights of investment firms to access remotely foreign post-trading infrastructure service providers and central banks. For others, however, it was also important, as the Commission suggested, that such rights are also introduced to allow CCPs to access other CCPs and CSDs and for CSDs to access other CSDs.

For the Commission, the main thrust of its proposed policy resided in this second type of rights. Indeed, remote access issues of investment firms has, to a large extent, been achieved through the provisions of the MiFID. The Commission proposed therefore to grant similar rights to infrastructures and simply to complement, whenever necessary, the rights provided for by the MiFID for coherency's sake.

One of the arguments used against the necessity to extend the rights of access to infrastructure service providers was that this could lead to the imposition/adoption of a “spaghetti” model of linkages. In addition, it was argued that the effort of a CSD to service the relevant activities through CSD links tends to lack economies of scale as compared to the business of custodial banking providers.

Related to this issue was the fear expressed by some respondents that if the Commission intended to provide intermediates and investors with a right to choose and to use the post-trading system of their choice, this would imply that the intermediating institutions, e.g., custodian banks, CCPs, CSDs etc., would have to maintain and offer to their clients several routes for clearing and settlement, even against their business plans. This would imply heavy costs and is not viewed by respondents as an appropriate solution in the EU context.

The Commission policy proposal, as expressed in the Communication, aims at facilitating the creation and the use of links rather than to impose them or to promote a particular model for cross-border post-trading. The Commission felt that looking ahead into the future the regulatory framework should be flexible and wide embracing, allowing for further developments in business practices and opportunities by current and future providers of services. The Commission felt that a regulatory regime, which limits the granting of access rights only to investment firms and fails to extend them to infrastructure service providers, would not provide the necessary flexibility.

[Also included within access rights is the access of issuers to CSDs. The need for comprehensive access rights in the EU should extend to issuers, as well as to investors.]

4.2.1.2 Common regulatory and supervisory framework

In its Communication, the Commission indicated that the common regulatory and supervisory framework should be based on a risk-based functional approach. Such a framework would introduce initial and on-going prudential and investor protection requirements applicable to

the providers of clearing and settlement services. It would also address supervisory co-operation issues.

The risk-based functional approach

The Commission proposed the adoption of a risk-based functional approach on regulation, i.e., of treating the same activities in the same way, provided the risk is the same.

A category of respondents did not entirely agree. For them, any legal framework should be based on a pure functional approach which takes no risk considerations into account. In essence, under this approach “same activity” equals “same regulation”.

However, the second, and most numerous, category of respondents agreed with the Commission that the functional approach should be risk-based. Such approach should take account of the risk profile of entities concerned and the competitive environment, in which they operate.

Within this family of responses, diverging opinions were given with respect to the effect that the intermediary-infrastructure dichotomy could have. For some respondents at least, this dichotomy is a contradiction to the approach and will be detrimental to the markets, while for others the dichotomy is relevant and helps to derive the level of risk associated with the performance of functions.

Finally, a small number of respondents preferred an institutional approach: CSDs and CCPs should be single purpose entities providing functions on a reserved basis.

Initial and on-going prudential and investor protection requirements

The Commission’s aim is to enable securities post-trading systems to provide services freely in other Member States. At the same time these entities represent an important source of counterparty and systemic risk to other market participants. For these reasons, the Commission considered it necessary that common initial and on-going prudential and investor protection requirements need to be established for entities providing such services.

The proposed framework would include capital adequacy requirements, which would be linked to functions and to the level of risk associated to those functions (the risk-based functional approach mentioned above). Capital requirements currently applicable to entities, such as banks, should be taken into account, notably with respect to credit risk.

The Directive should also establish high level principles on risk management, such as “delivery versus payment” rules, along with some further principles on investor protection, such as those aimed at preserving the integrity of the issue and at protecting customers’ securities.

In view of the rather sketchy proposals made by the Commission in its Communication, respondents focused on certain specific but general policy issues.

First, the introduction of capital adequacy requirements met with the approval of an important number of respondents. Concerns were, however, expressed about the complexity of elaborating such a regime. The differences of the systemic risks associated with operating CCPs and CSDs were raised. It was suggested that these should be taken into account when devising any capital adequacy requirements for CCPs and CSDs.

Other respondents, including Member States’ authorities, banking institutions, etc., disagreed with the introduction of capital adequacy requirements. It was suggested that in managing

systemic risks, it may be more important to ensure appropriate backup and redundancy facilities than to require a certain amount of capital.

On the issue of risk avoidance, the most hotly debated issue was the question on whether the proposed legislative framework should allow CSDs/SSSs to incur financial risk at all and, if they do, whether they should be obliged to legally separate the entity incurring such risk.

Views were polarised on this issue. For a great number of respondents, mainly banks, issuer associations and some Member States' authorities, any future EU legislation should provide that CSDs and SSSs do not engage in financial risk taking activities. In addition, it was argued that if a CSD is part of the same corporate group as a credit institution, custodian or any other entity authorised to take banking risks, there should be a strict (i.e. legal) segregation between these entities. The reasons put forward by these respondents in support of their arguments relate to the systemic importance of these institutions and on competition law considerations.

Others were totally opposed to this idea. These were mainly representatives of the infrastructure service providers and some other Member States' authorities.

Another risk related issue was whether the use of central bank money for settlement should be imposed as an obligation to SSSs or not. The opinions were diverse. An important number of respondents considered that the use of central bank money for settlement should be a necessary requirement under the directive. Others, on the contrary, proposed that this should be an option; SSSs settling in commercial bank money should simply provide a choice for their participants to settle in central bank money.

The possible repercussion of any future post-trading legislative framework on custodian banks was also extensively commented. It was argued that custodian banks should not be subject to any post-trading Directive requirements since they are already adequately covered by other regulatory frameworks. Others respondents simply requested that the Commission should consider whether risks borne by banks are already covered under the existing banking Directives, so as to avoid over- or double-regulation.

Supervisory cooperation

In the Communication, the Commission suggested that the regulatory framework needs to incorporate a model for supervisory co-operation. This would increase the consistency of supervisory practices and will limit the cases, where securities clearing and settlement systems operating cross-border are subject to the supervision of multiple supervisors.

The home country principle proposed in the Communication was supported by most of market participants, except public authorities, which, while recognising the need for greater cooperation, disagreed with this principle, promoting a more flexible approach to cooperation. One of their main concerns was the issue of systemic risk in the host country and the need for the host country authorities to be implicated in addressing it.

4.2.1.3 Governance - accounting separation and unbundling of services

The third aspect to be covered by the Directive would be governance. Discussion on this issue mainly centred on the suggestion by the Commission that CCPs and CSDs should be obliged to segregate accounts and to unbundle the services they provide as monopoly services together with the rest of their services.

As expected, the respondents were divided. Banks mostly agree while CSDs, CCPs and vertically integrated entities disagree with the Commission's suggestion. Among the remaining respondents, the exchanges, which do not belong to any vertical silo, mostly agree, governments are split, while a few securities regulators are in favour.

The main arguments used by the opponents to these measures are: (a) that ex-ante governance rules are not necessary because the active implementation of existing competition law will be sufficient to address anticompetitive behaviours; (b) that the distinction between “core” and “value-added” services is misguided and inappropriate; and (c) that such requirements would require tremendous IT investments and are intrusive in the internal organisation of the entities concerned.

On the other hand, some supporters of these measures considered them as insufficient to address the competition and safety risks involved.

4.2.2 Competition

Respondents agreed that the enforcement of competition law is an essential element in ensuring a level playing field in the development of integrated financial markets in the EU. Most banks, infrastructures and national authorities agreed that a pro-active enforcement policy needs to be pursued by all competition authorities. In their opinion, this would be an adequate safeguard against potential abuses, on condition that authorities are adequately staffed and trained. A small minority of respondents pleaded, however, for additional ex-ante measures, such as guidelines for dominant companies, in order to pre-empt any abuses from taking place.

The general view was that consolidation in the sector is expected to continue. With one exception, respondents agree that the market itself should define the future shape of the industry. However, concerns were expressed that cross-border mergers in the sector are not submitted to EU scrutiny. A plea was therefore made that any major new consolidation initiative between infrastructures to be automatically regarded as having a European dimension and scrutinised at an EU level.

4.3 Conclusion

The written comments to the Commission's Communication, in which the majority of the respondents generally endorsed the Commission, together with the extensive consultations conducted with the private sector, gave the Commission a unique insight into the opinions of the various stakeholders about post-trading issues, thus representing a valuable input for this document.

While the consultation process has been lengthy (almost two years) it has been extremely useful as it managed to get the stakeholders on board and it allowed the Commission to refine the policy proposals given in the Communication.

5 THE BENEFITS OF INTEGRATED AND/OR CONSOLIDATED POST-TRADING SYSTEMS

In the previous chapters we have argued that, while security settlement systems are safe and efficient on the national level, they "combine" less efficiently and (potentially) less safely on the EU level, because of the existence of various barriers to cross-border transactions. This fragmentation of the EU post-trading landscape results in higher operational costs for post-trading services providers, due to lack of scale, and in higher costs for end-users, mainly due to the complex web of intermediaries they have to use in order to get around these barriers⁴¹. The purpose of this chapter is to further investigate and analyse the costs of the inefficiency of EU post-trading arrangements. In particular, three main issues are considered in detail:

1. price differentials between domestic and cross-border post-trading activities and price differentials between domestic activities in the EU and the US; this gives us the potential scale of cost reduction stemming from integration and/or consolidation;
2. the impact of cost reduction on GDP; and
3. the possible impact of cost reduction on total factor productivity.

To deal with the above issues, the cost analysis can be conducted at least on three levels:

- i. the first and most immediate level is the **“static” analysis**, which simply considers the difference between domestic and cross-border post-trading costs as a proxy for the static cost of fragmentation. Annex I presents two main approaches to evaluate these costs and leads to a range of values which are reported and commented in section 5.1 of this chapter;
- ii. the second level is the **“first-order dynamic” analysis**, the purpose of which is to estimate the impact of a reduction in transaction costs on GDP. In order to do so, the analysis first estimates a measure of the price elasticity of demand for equity transactions by using a large database of equity trades. It then uses this elasticity, together with the results of the static exercise, to calculate the new price-quantity market equilibrium. Next, it calculates the elasticity of the cost of capital to both transaction costs and liquidity and uses these, together with the new market equilibrium to calculate the change in the cost of capital. Finally, it uses this last result to calculate the absolute and relative changes in GDP, with the respective uncertainty bounds. The whole procedure is explained in detail in Annex II, with results commented in section 5.2;
- iii. the third level is the **“second-order dynamic” analysis**, which takes into account future changes in the behaviour of economic agents. In particular, several sources of behavioural change may be identified, since the new opportunities offered by an integrated market not only allow economic agents to significantly change the way in which they conduct their business, but should also provide scope for improved risk management, thus facilitating investment in riskier and higher return investments,

⁴¹ While the costs that they bear can not be pinned down to any singular link in this complex web (they are spread throughout it), they are excessive in two aspects: first due to the simple fact that they need to use more intermediaries than would be necessary in an integrated market and second due to the opacity that is created by the complexity.

e.g. venture capital and private equity activities. These aspects are explored in section 5.3.

These three methods of analysis capture different aspects (and to different degrees) of the implications of a reduction in post-trading costs on market liquidity, the cost of capital and consequently on GDP. This is important because, in the end, what really matters is the extent to which the cost reduction will impact GDP growth in the EU. This aspect is explored in section 5.3.

5.1 The static cost of a fragmented post-trading market in Europe

In the current EU economic framework, cross-border post-trading is more expensive than domestic post-trading. Furthermore, the domestic post-trading in the EU is more expensive than in the US.

The studies surveyed in Annex I try to estimate the excess costs. They can be divided into three different types:

- **“top-down” studies**, which add up the operating incomes, the expenditures and the transactions of the various national post-trading infrastructures to a European total, comparing the result with operating incomes and expenses of the US DTCC, which is used as a benchmark for a fully consolidated system;
- **“bottom-up” studies**, which derive the post-trading cost of a single transaction from the actual fees and commissions paid by users for typical transactions offered by typical post-trading providers;
- **industry studies**, directly sponsored or performed by infrastructure operators, which cannot be easily included in either of the two categories above.

The object of Annex I is to analyse all of these studies, to improve them wherever possible⁴² and to reconcile the results.

Four main results emerge from the analysis of the studies (see Annex I for more details):

- i. In the EU context, from an investor’s point of view, a cross-border equity transaction is, on average⁴³, twice to six times more expensive than a domestic transaction. The value of the ratio is very high and not in line with the ambitions of a single securities market in the EU. In particular, as concerns the excess costs of a cross-border equity settlement with respect to a domestic equity settlement, available studies seem to converge towards an average value of between €15 and €20 per transaction⁴⁴.

⁴² This means updating the underlying data, correcting material errors (double counting, wrong attribution etc.), offering alternative benchmarks (e.g. an EU CSD instead of the US DTCC for the “top-down” studies) and many other instances which are all reported in Annex I.

⁴³ In some cases, cross-border transaction costs have been found to exceed domestic ones by several hundred times. Indeed, in the 2004 Annual Report on Competition Policy, Commissioner Kroes found instances where cross-border transactions cost 350 times more than domestic ones. Fortunately, such cases are very limited.

⁴⁴ The study from which this estimate was taken (AFTI/Eurogroup, 2005) does not include custody costs. A previous study, carried out by the same group in 2002, found excess costs of between €18 and €25 per transaction (again, excluding custody costs). Given that custody costs are higher for cross-border than for domestic holdings of securities, including these would make the excess cost even higher.

- ii. From a system point of view, a domestic transaction is up to eight times more expensive in the EU post-trading infrastructures than in the US DTCC⁴⁵ (see table 6 in Annex I for more details).
- iii. The available studies show that a reasonable range for the aggregate excess cost of post-trading for investors is between €2 billion and €5 billion.
- iv. Considering that the estimate for investors' total spending for trading and post-trading is about €28 billion per year in Europe, a reduction in costs between €2 billion and €5 billion would translate into an average reduction of transaction costs for investors of between 7% and 18%. These estimates represent only the benefits of "integration". Additional cost reductions (approximately €700 million) could be achieved through market consolidation. These potential cost reductions, on an average EU basis, are likely to bring significant economic benefits. The economic significance of this accounting evidence is presented and analysed in the next section.

5.2 A first-order estimate of the potential economic significance of a reduction in cross-border post-trading costs ("first-order dynamic impact")

In the year 2000, the Commission launched the Financial Service Action Plan, a significant effort to integrate financial markets in the EU. In 2002, London Economics (see London Economics, 2002) published a well-known "quantification of the macro-economic impact of integration of EU financial markets". This study constitutes the first substantive empirical research on the impact of financial integration on trading in Europe. In particular, it (i) evaluates the impact of integrating EU stock and bond markets on trading costs and on the cost of capital; (ii) in the eventuality that additional costs are discerned, it quantifies the consequent impact on investment, GDP and employment; and (iii) it highlights the powerful role that efficient and liquid financial markets can play in complementing bank-based finance, thus supporting growth and employment in the EU. According to the study's findings, the benefits of greater integration in the EU financial market, caused by a combined reduction in the cost of equity, bond and bank finance, together with the increase in the share of bond finance in total debt finance, are:

- i. the level of EU-wide real GDP is raised by 1.1%, or €130 billion in 2002 prices, in the long-run;
- ii. the EU GDP per capita in 2002 prices is €350 higher;
- iii. total business investment is almost 6.0% higher and private consumption increases by 0.8%; and
- iv. total employment is 0.5% higher.

These results can be considered as the **maximum possible economic benefit** that can be derived from the integration of financial markets. This means that they presume a complete integration of post-trading structures in Europe. The economic benefits directly related to integrating these structures will, of course, be a subset of this total⁴⁶. The aim of this section is to determine how big this subset is and how to estimate it.

⁴⁵ The first Giovannini Report found a ratio of 11:1, but the two results can not be compared due to different methodologies used.

⁴⁶ Although, as Dr. Giovannini declared in his public appearance before the ECON committee of the EP held in Feb 2004 that "C&S is not about Financial Markets. C&S is the Financial Markets", implying that the lack of success in integrating C&S across Europe would prevent other benefits from financial integration to materialise.

5.2.1 The impact of cost reduction on capital market equilibrium

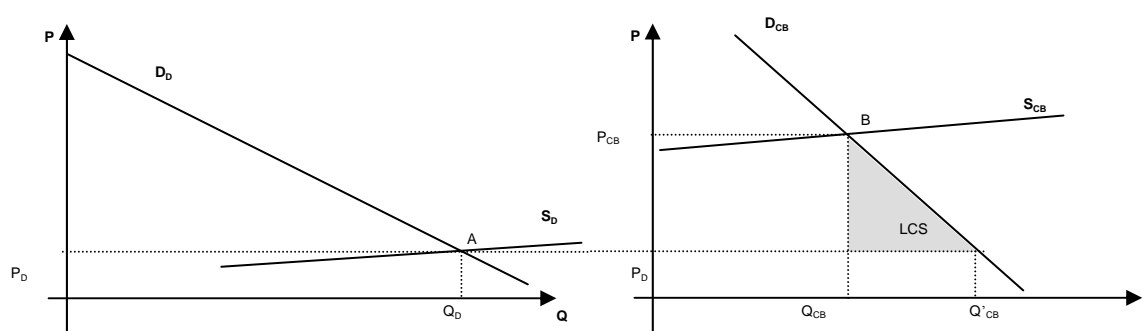
The classical demand and supply analysis, as represented in Figure 5.1⁴⁷, offers a good starting point to evaluate the dynamic effects coming from a reduction of post-trading costs. The impact of a costs reduction on the market equilibrium depends crucially on three issues:

- i. the elasticity of the demand curve,
- ii. the elasticity of the supply curve, and
- iii. the competitive form of the market.

Ad i) Using the same database of the London Economics' study, Annex II has estimated the elasticity of trading turnover (used as a proxy for market liquidity) to trading costs⁴⁸ (the demand function) for 21 stock exchanges, among which all EU-15 Members States but Luxembourg. The results are rather interesting and coherent with economic intuition: markets in general exhibit a significant negative elasticity, i.e. lower trading costs lead to a higher trading turnover. Moreover, the impact seems to be higher for smaller exchanges. Within the EU, the estimated elasticities range from -0.7 (London) to -3.3 (Dublin). The demand schedules in Figure 5.1 are therefore drawn as downward sloping (strictly speaking a simple demand curve for both domestic and cross-border could suffice; however, two different curves with different slopes can be drawn if one wants to represent the assumption that an inherent market bias, i.e. the "home bias" exists).

Ad ii) The elasticity of the supply function of post-trading services has not been estimated. However, since fixed costs dominate marginal costs, one may assume that the supply curve is only slightly upward oriented⁴⁹. This conclusion has been empirically confirmed by the study of Schmiedel et al. (2002). For this reason, in Figure 5 the supply curves are drawn reasonably flat (the different level of the two curves is due to higher costs involved in cross-border transactions relative to domestic transactions).

Figure 5 – Domestic and cross-border market equilibrium



⁴⁷ The choice of linear demand and supply schedules was purely due to reasons of simplicity and does not reflect the actual shape of the schedules in the market for post-trading services.

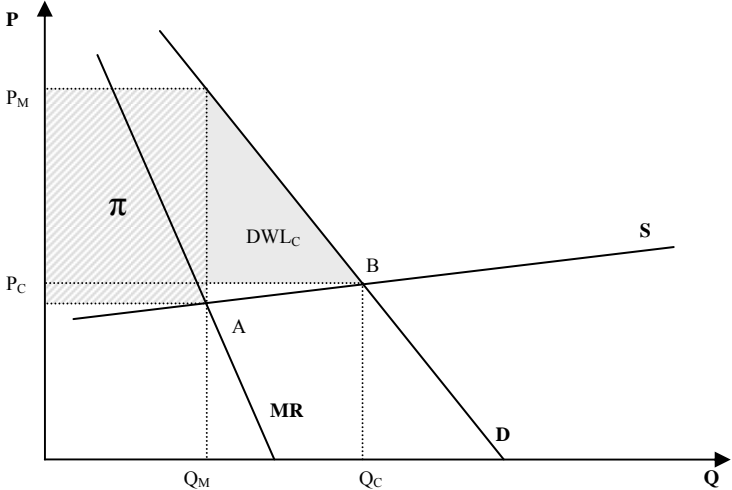
⁴⁸ The choice of trading costs seems appropriate for two reasons: first, demand for post-trading services is highly correlated with demand for trading services, and second, estimating the demand curve on the basis of trading costs has the advantage of statistical robustness, because of the underlying wide and comprehensive dataset, which is the same used by the often cited London Economics' study on the impact of financial market integration.

⁴⁹ Given the existence of economies of scale, an increase in the number of transactions processed should not cause a substantial rise in the costs for the provider of the post-trading services (more precisely, one may expect that the average cost curve becomes flatter and flatter when quantity increases) and thus of prices for users.

In figure 5 the left panel depicts the equilibrium in the domestic market (point A), while the right panel depicts the cross-border equilibrium (point B). As we can see in the above figure, the domestic market equilibrium has a lower price (P_D) and a higher quantity (Q_D) compared to the cross-border market equilibrium (respectively P_{CB} and Q_{CB}). As a consequence, decreasing the cost of cross-border transactions, i.e. shifting the supply schedule downwards, would result in a lower price and higher quantity, recapturing at least part of the lost consumer surplus (LCS).

Ad iii) Regarding the competitive form of the market, the two extremes are a monopolistic profit-maximising provider and a provider with profits tending to zero (either because there is perfect competition or because the provider is user-owned and does not pursue profit). The two market forms are depicted in Figure 6 In the first case, the quantity supplied is determined by matching marginal revenues with marginal costs (point A), in the second by matching the supply and demand curves (point B). As we can see in the figure, the non-competitive market equilibrium has a higher price (P_M) and a lower quantity (Q_M) than the competitive one (respectively P_C and Q_C). The area denoted π represents monopolistic profits and DWL_C corresponds to the consumers' deadweight loss.

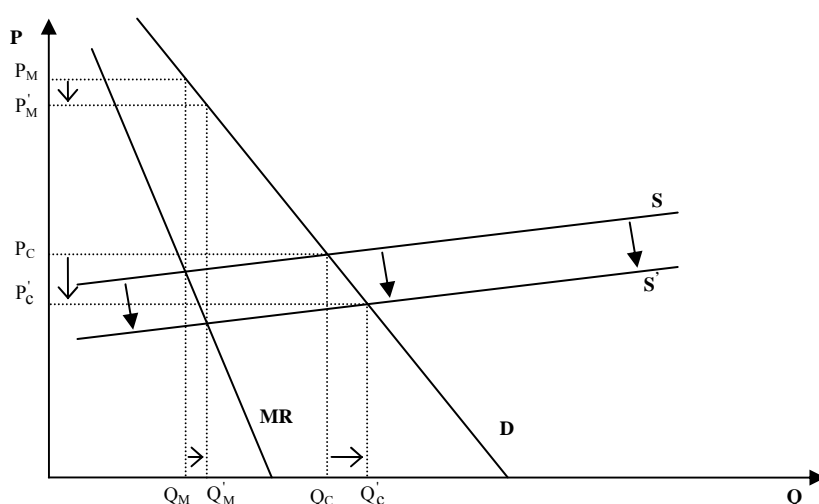
Figure 6: Market equilibrium in competitive and non-competitive markets



In the market for cross-border post-trading services for equities, competition is nearly non-existent at present, with the EU capital market much closer to the non-competitive model. A lowering of post-trading costs, either due to the opening up of markets to competition or due to other reasons (e.g. innovation), would therefore result in a lower equilibrium price and a higher equilibrium quantity, together with a reduction in the investors' deadweight loss. The total increase in welfare would of course be bigger in case of a switch to a competitive market, as in this case the equilibrium would be determined along the demand curve - and not along the marginal revenue curve - bringing about the lowest possible price, the highest possible quantity and the elimination of the investors' deadweight loss.

Increasing the contestability of the market would be desirable also due to another reason. As shown in Figure 7, a technological shock which would decrease the costs of post-trade, thus causing a downward shift of the supply curve (from S to S'), would have a far bigger impact on the reduction in price and the increase in quantity in a competitive market than in a non-competitive one. This is because in the latter, the equilibrium price and quantity are determined along the marginal revenue curve, which is by definition steeper than the demand curve, i.e. it is more inelastic. This makes quantity less sensitive to changes in price.

Figure 7: The impact of a cost reduction



To sum up, it appears that a reduction in transaction costs – due to a fall in post-trading costs - of the magnitude described in section 5.2 (between 7% and 18%) may result in a significant increase of the trading turnover in the integrated EU equity market. However, one should not mechanically infer that, e.g., a reduction in post-trading costs will have a bigger impact in Dublin than in London, simply based on the fact that the former was found to have a higher price elasticity of demand than the latter⁵⁰.

An increase in trading turnover would significantly change the equilibrium point of the EU market, since:

- i.) more trade would be done at lower costs and the investors' deadweight loss due to the cross-border barriers would be significantly reduced;
- ii.) more market openness and more direct access to foreign markets could dramatically change the competitive form of the market, reducing the mark-up imposed by providers and further increasing the impact of reduced costs on equilibrium price and quantity; and further reduce the investors' deadweight loss.

To improve market contestability, and thus ensuring that the full benefit of a cost reduction is reflected in the liquidity of the market, measures such as access rights, no market foreclosure and no cross-subsidisation of activities may prove useful.

5.2.2 The impact on GDP

Lower post-trading costs translate into greater liquidity and reduced cost of capital. However, the crucial question regards the impact of the reduced cost of capital on EU GDP. In order to estimate the macroeconomic impact of a change in the cost of capital, we use two approaches (see Annex II for details):

- the first approach employs a simple model based on a **Cobb-Douglas function**, estimating the change in the long-run equilibrium level of GDP without explicitly analysing short-term effects;
- the second approach estimates the change in GDP for a 20 year horizon, based on the model outlined in Ratto, Roeger, in't Veld and Girardi (2005). This model is based on an

⁵⁰ This is because the analysis in Annex II assumes that demand curves are isoelastic (i.e. they have constant elasticity), which may not be the case in reality.

optimisation for a firm with an infinite time horizon, confronting a permanent shock to the risk premium (that is, the cost of capital). This model is different from the first one in that it is based on an optimisation at the firm level, and not on aggregate values for the whole economy.

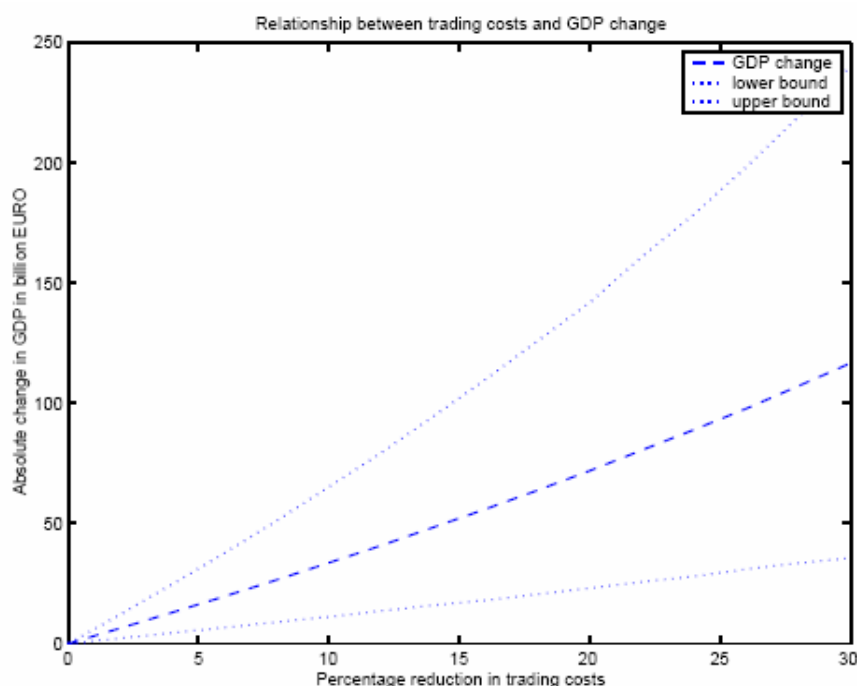
Interestingly, both models yield very similar estimates, so results are reported only for the first model.

The change in the level of GDP is computed by additionally including the uncertainty in the estimates obtained at the different stages (see Annex II). This yields a distribution for the change in the level of GDP. The average change in the level of GDP in case of a 7% (18%) reduction in transaction costs is €23 (€63) billion with a standard deviation of €9 (€27) billion. The 2.5%- and 97.5%-quantiles are given by €8 (€20) and €47 (€124) billion. This means that with a probability of 95%, the change in the level of GDP is between €8 (€20) billion and €47 (€124) billion. In relative terms, the level of GDP changes by 0.2% (0.6%) on average, with the corresponding quantiles of 0.1% (0.2%) and 0.4% (1.2%). In terms of the probability of not-exceeding a lower bound, the change in the level of GDP is not below €10 (€25) billion with a probability of 95%.

If we consider that uncertainty is present at the different steps of the analysis, the fact that confidence intervals are rather large is not surprising. Moreover, there is also considerable uncertainty regarding the estimates of the upper limit to growth opportunities, because we have not included two additional growth effects: first, the potential effect of a lower cost of capital on total factor productivity and second, the potential effect of behavioural changes of market participants.

As a final step, we compute the sensitivity of changes in GDP to variation in trading costs. We assume a relative deviation of 30 percent from the mean value of the change in trading costs. The sensitivity of the GDP changes with respect to a reduction in trading costs is then computed, in steps of 2.5 percent, for values between 0 percent and 35 percent. The result is plotted in the figure below and shows the confidence bands for all estimates and the mean estimate. The plot shows that GDP is strongly increasing with higher reductions in trading costs. Not surprisingly, the confidence bands are widening for higher values. This step is actually an extension of the previous ones, because, to compute the impact on GDP, it uses a set of potential average reductions in trading costs instead of computing the change in GDP for only two mean values.

Figure 8: Relationship between trading costs and GDP change



The current analysis is closely linked to the study done by London Economics and it would therefore seem natural to compare their respective results. However, despite the fact that these results are reasonably similar (our work estimates an average rise in the level of GDP between 0.2% and 0.6% compared to the 1.1% for the London Economics study), they can not be directly compared, because the focus and the underlying econometric models, used in the two studies, differ considerably. In particular, while our work analyses only the impact of lower transaction costs (caused by lower post-trading costs) on the cost of capital and GDP, the London Economics study is a broader analysis where post-trading is only a part - although a potentially crucial one - of the EU financial market integration.

5.3 A possible reorganization of the supply side (“second-order dynamic effect”)

The supply side is typically slower than the demand side to react to a major change in the competitive environment. However, its changes tend to be very significant and long-living. In terms of an econometric analysis, the integration of the market and the subsequent change of the supply side would certainly constitute a structural break.

According to the theory, economic growth is determined by capital investment, labour supply and total factor productivity (TFP). Therefore, to detect the areas most likely to witness a significant costs reduction, we can consider a standard production function, which explains output growth (Y) as a function of physical investment (K), active labour supply (L) and total factor productivity (TFP). The level of Y is increasing in the level of inputs used (K, L and technology), while the growth rate in Y is increasing in the growth rate of these three inputs. In other words, increased capital investments, more active labour supply and technology advances result in a higher level of economic performance, while the growth of these inputs affects the growth rate of the economy.

Total factor productivity reflects the ability to combine labour and capital more effectively over time, due to changes in input qualities (more appropriate skills or embedded technologies) or to better methods of organization. TFP is typically assumed to be either a

function of K alone or - in more recent literature – a function of K and of the less tangible form of investment in R&D/innovation. TFP is increasing both in K and in R&D/innovation expenditure, but is relatively more responsive to the latter, since R&D/innovation potentially delivers high economic and social returns.

Studies of the economic effects of financial integration mainly focus upon changes in transaction costs and their implications for the user cost of capital (UCC). Financial integration is expected to deliver lower UCC, resulting in a higher level of capital investment.

In this context, both the LE and our analysis of economic benefits focus on the impact of financial integration – facilitated by an integrated and/or consolidated post-trading industry - on investment (both K and R&D), via a reduction in the UCC. The latter can be reduced through a series of channels, e.g. lower trading costs, increased market liquidity and intensified competition between the various sources of financing. *Ceteris paribus*, a lower UCC creates the conditions for a higher level of investment, and consequently a higher level of output. In quantitative terms, the LE analysis forecasts a 1.1% increase in the level of EU GDP over a 10-year period.

Both the LE and our analysis say less about the impact of financial integration in providing opportunities for more efficient risk management. Deeper and more liquid financial markets should make it easier to manage financial risk, improving the aggregate risk-return relationship for investment. An improved risk-return relationship will expand the set of investment opportunities for economic agents and, *ceteris paribus*, will be reflected in higher levels of investment. While the levels of physical investment and R&D expenditure will increase, the increase should be proportionally greater for R&D expenditure, which is typically characterised by high economic and social returns but also by a relatively high investment risk. The positive effect of an improved risk-return relationship on K and on R&D expenditure will be reflected in a significant rise in TFP. Higher TFP will impact positively on the growth rate of EU GDP, implying an additional and durable improvement in economic performance, beyond what presented in the LE/Commission analysis.

A further dimension of the analysis relates to possible changes in the coefficients for K and L in the production function, due to changes in the financial environment. This possibility reflects a type of “Lucas critique”, where the integration of the financial market would represent a structural break (albeit realised incrementally over many years), resulting in behavioural changes of economic agents – in terms of their financing preferences, their conduct of business, their corporate organisation etc.

5.4 Conclusions

Several conclusions can be drawn regarding the economic impact of a lowering of post-trading costs on EU GDP.

Firstly, a reduction in post-trading costs has a consistent impact on liquidity, and thus on GDP. In particular, a more efficient post-trading system, leading to a lowering of transaction costs of between 7% and 18%, can result in a higher level of GDP (on average between 0.2% and 0.6%) in the subsequent years. This result is robust to different model specifications.

Secondly, the impact of a given cost reduction on liquidity crucially depends on the competitive form of the market: the more competitive is the market, the greater is the impact of cost reduction on liquidity and therefore on GDP.

Thirdly, our analysis does not include the impact that a lower cost of capital would have on TFP. Financial integration impacts on TFP directly, via higher capital investment, but also –

and maybe more importantly – indirectly, to the extent that financial integration improves opportunities for risk pooling. Improved risk pooling should increase average risk-return relationship in investment, facilitating expenditure on higher risk R&D/innovation; higher TFP implies a rise in economic growth rate, delivering additional and more durable benefits. It is therefore very much likely that, by not taking specifically into account changes in TFP, our analysis underestimates the potential increase in GDP.

Furthermore, the sensitivity of future GDP changes to different realizations of the input variables reveals further growth potentials. There is indeed a good chance that EU GDP will change by more than predicted, because the integration of financial markets could cause changes in the behaviour of economic agents – in terms of their financing preferences, their conduct of business, their corporate organisation etc.

Finally, the above analysis, as previously pointed out, is made uniquely for the equity markets, leaving out bond markets. While it is true that these are more competitive and have therefore lower excess costs, it can still be argued that additional benefits would arise from further integrating them.

Given the sizable benefits that would stem from integration/consolidation of the post-trading industry, action should be taken to eliminate the barriers that hamper these processes.