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**Analysis of the pros and cons of  
introducing a central counterparty in  
the Danish securities market**

**30 November 2007**

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# **Analysis of the pros and cons of introducing a central counterparty in the Danish securities market<sup>1</sup>**

Governor Torben Nielsen  
Peter Restelli-Nielsen

30 November 2007<sup>2</sup>

## **Summary and follow-up on the conclusions to the paper**

This paper describes the activities of central counterparties (CCPs) and the international framework for those activities. It also provides an overview of the activities of the CCPs in the EU. Against this background, an initial assessment is performed of the possibilities of introducing a CCP in the Danish market.

The preliminary conclusion is that there seems to be a limited need for a CCP in the Danish market. Furthermore, the initial costs involved seem to be relatively high. However, a more detailed analysis is recommended concerning the expediency of introducing a CCP on the repo market, where higher risks are involved. Here, the introduction of a CCP would also offer administrative or capital-adequacy benefits.

Prior to publication, the paper was submitted to the Danish Bankers Association, VP Securities Services and OMX Nordic Exchange Copenhagen. They all have a positive attitude to Denmark's Nationalbank initiating renewed discussions of the possible benefits of introducing a CCP in the Danish market. OMX Nordic Exchange Copenhagen has requested that the conditions for retaining foreign market participants, especially after 1 November 2007, when the MiFID Directive entered into force, should be incorporated in the analysis and be a key element in the conclusion to the paper. The consultation response from OMX Nordic Exchange Copenhagen is reproduced in Appendix 1.

After the publication of the paper, one or more meetings will be held with market representatives with a view to discussing the preliminary conclusions to the paper and the assumptions on which they are

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<sup>1</sup> We would like to express our thanks to our colleagues and partners, including Roland Neuschwander, Deutsche Bundesbank; Beata Wrobel, Narodowy Bank Polski; Viggo Rosenqvist, Danske Bank; Peter Glismann, Nordea Bank Danmark; Lars Ravn Knudsen, the Danish Bankers Association; Mogens Kruse, VP Securities Services; and Marianne Majbrink, the Danish Financial Supervisory Authority.

<sup>2</sup> This analysis is based on information available up to the summer of 2007.

based. At the same time, OMX Nordic Exchange will be able to present its comments.

|   |    |
|---|----|
| Analysis of the pros and cons of introducing a central counterparty in the Danish securities market ..... | 3  |
| Summary and follow-up on the conclusions to the paper .....   | 3  |
| 1. Introduction.....  | 6  |
| 2. Risks related to clearing and settlement of securities trades .....                                    | 8  |
| 2.1. Marketplace trading systems .....  | 8  |
| 2.2. Counterparty risk on settlement of securities trades .....   | 8  |
| 2.3. Limitation of risks in central securities depositories .....   | 9  |
| 2.4. Conclusion .....   | 10 |
| 3. Functionality and international framework for CCP activities.....                                      | 11 |
| 3.1. Functionality of central counterparties .....  | 11 |
| 3.1.1. Definition .....   | 11 |
| 3.1.2. Netting .....  | 11 |
| 3.1.3. Anonymity .....  | 15 |
| 3.2. International standards for risk management in CCPs.....   | 15 |
| 3.2.1. Legal framework and public regulation .....  | 16 |
| 3.2.2. Operational requirements .....   | 16 |
| 3.2.3. Hedging of counterparty risk .....   | 17 |
| 3.2.4. Liquidity risk and securities lending facility.....  | 18 |
| 3.2.5. Other requirements .....   | 19 |
| 3.3. Conclusion .....   | 20 |
| 4. CCP activities in the EU member states.....  | 21 |
| 4.1. Overview of CCPs in the EU .....   | 21 |
| 4.2. CCP activities on the share markets .....  | 22 |
| 4.2.1. Large share markets without CCPs .....   | 23 |
| 4.3. CCP activities in the bond markets .....   | 24 |
| 4.3.1. Bond markets and trading via MTS.....  | 24 |
| 4.3.2. CCP activities in the bond markets .....   | 25 |
| 4.4. Conclusion .....   | 25 |
| 5. Introduction of a CCP in Denmark.....  | 27 |
| 5.1. The functionality of the Danish market.....  | 28 |
| 5.1.1. Turnover in the Danish securities market.....  | 28 |
| 5.1.2. Settlement of securities trades.....   | 29 |
| 5.1.2.1. Reporting of trades .....  | 29 |
| 5.1.2.2. VP's settlement day reflects link to Euroclear .....   | 30 |
| 5.1.2.3. VP's settlement cycle.....   | 30 |

|          |  |    |
|----------|--|----|
| 5.1.2.4. | VP's DvP settlement.....   | 31 |
| 5.2.     | Possible CCP models .....  | 32 |
| 5.2.1.   | A Danish CCP .....   | 32 |
| 5.2.2.   | A Nordic CCP .....   | 33 |
| 5.3.     | Existing settlement risks in the Danish market.....  | 35 |
| 5.4.     | Assessment of the basis for CCP clearing in the Danish market.....   | 35 |
| 5.4.1.   | Limitation of credit risk .....  | 36 |
| 5.4.1.1. | Reduction of credit risk via bilateral netting .....   | 36 |
| 5.4.1.2. | Delayed reporting of share trades .....  | 37 |
| 5.4.1.3. | The bond and repo markets.....   | 38 |
| 5.4.2.   | Limitation of liquidity risk .....   | 38 |
| 5.4.3.   | Anonymity .....  | 39 |
| 5.4.4.   | Netting .....  | 39 |
| 5.4.5.   | Costs.....   | 41 |
| 5.4.5.1. | The bond market .....  | 41 |
| 5.4.5.2. | The share market .....   | 42 |
| 5.4.5.3. | Interest among market participants .....   | 42 |
| 5.4.5.4. | A Nordic CCP and the repo market .....   | 42 |
| 6.       | Conclusion.....  | 44 |
| 7.       | Literature .....   | 48 |
| 8.       | Appendix 1 OMX Nordic Exchange Copenhagen's comments on the working paper concerning the introduction of a CCP in Denmark..... | 50 |
| 9.       | Appendix 2 BIS Recommendations for Central Counterparties.....   | 53 |

## 1. Introduction

Settlement of securities trades on a specific market can be ensured by establishing a central counterparty (CCP). The CCP enters into trades concluded between participants in the relevant market, thereby acting as buyer and seller in relation to the participants in the settlement. For the participants this means that their original counterparties are replaced by the CCP. By entering into the trades, the CCP undertakes to ensure the settlement, and thus the settlement risk is concentrated on the CCP.

Since CCPs both limit and concentrate settlement risk, they have been the focus of international discussions in various forums, including supervisory authorities and central banks.

In November 2004, the Bank for International Settlements, BIS, and IOSCO, the International Organization of Securities Commissions, which monitors securities markets, issued a report, *Recommendations for Central Counterparties*, containing 15 recommendations for limiting and handling CCP risk. The same forum in November 2001 issued a similar report containing 19 recommendations for securities settlement systems, of which the fourth recommendation prescribes that the benefits and costs of establishing a CCP should be analysed<sup>3</sup>. No CCPs have been established in the Danish market. However, clearing and settlement of Danish futures and options take place on the Stockholm Stock Exchange, where OMX Derivatives Markets enters into the trades as CCP.

In accordance with the above recommendation, the introduction of a CCP has been discussed repeatedly in terms of both the Danish and the Nordic markets. The most recent studies were carried out at the end of 2001 and the beginning of 2002 and concerned the establishment of a Nordic CCP. The purpose of this paper is to invite once again the market participants and other infrastructure participants, including OMX Nordic Exchange Copenhagen and VP Securities Services, to assess whether conditions have changed in such a way that there is a basis for introducing a CCP in the Danish market.

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<sup>3</sup> Both reports can be found at the BIS website, [www.bis.org](http://www.bis.org). Danmarks Nationalbank's and the Danish Financial Supervisory Authority's joint Review of VP Securities Services in relation to Recommendations for Securities Settlement Systems can be found at Danmarks Nationalbank's website.

This paper focuses on the pros and cons of establishing CCPs in relation to spot trades in the Danish infrastructure. There may be particular arguments in favour of introducing a CCP for cross-border settlement, but any such need will not be the subject of specific analysis. In addition, the paper will touch on CCP clearing in relation to the repo market. As opposed to derivatives trades, spot trades are settled immediately after their conclusion, whereby the settlement risk is limited.

Section 2 outlines the securities trading and settlement process and the resulting settlement risks. Section 3 describes the functionality of CCPs and the international framework for their activities. In this connection it is explained how a CCP must limit its risks in accordance with the international recommendations. Moreover, the description of the CCP functions illustrates the resources needed to establish them. Section 4 provides an overview of CCP activities in the EU member states broken down by share and bond markets. Finally, section 5 describes trading and settlement in the Danish markets and the resulting risks. Section 5 also discusses the possibilities of introducing CCP clearing in the Danish markets and assesses the basis for doing so. Section 6 contains the conclusion, which can to some extent be read separately.

## **2. Risks related to clearing and settlement of securities trades**

Securities are traded in different marketplaces such as stock exchanges and various international electronic trading platforms. MTS, where most government securities of the EU member states are traded, is an example of such a trading platform, cf. section 4.3. Securities are also traded directly between buyers and sellers, i.e. independently of a marketplace (over-the-counter or OTC trading). Trading by telephone is a typical example of this.

When a trade has been concluded, the parties have a counterparty risk vis-à-vis each other, i.e. a risk that the counterparty will not deliver its part of the trade. Compared to previously, the counterparty risk is limited because securities trades are settled electronically.

### **2.1. Marketplace trading systems**

The marketplaces use trading systems of different designs with a view to making each market as efficient as possible. In general, markets are categorised as quote-driven or order-driven markets.

Quote-driven markets, also known as price-driven markets, are characterised by a number of participants or market makers having undertaken to continuously provide bid and ask prices on a number of securities, which are reported to the market.

In order-driven markets, buyers and sellers enter their purchase or sales orders in the system; trades are then concluded to the extent that the entered orders match.

In both types of market, the participants typically do not know the identity of their counterpart prior to concluding the trade. Normally, anonymity is ensured in both quote-driven and order-driven markets so that the system does not allow participants to see which market makers have reported prices, or which participants have entered trades. This means that the parties are not able to take their counterparty risk into account at the time of trading.

### **2.2. Counterparty risk on settlement of securities trades**

When concluding a trade, a party undertakes to deliver its part of the trade and obtains an opposite claim on the counterparty. Until delivery has taken place and the claim ceases, there is a counterparty risk.

The counterparty risk can be divided into a credit risk and a liquidity risk, which will materialise if the counterparty fails to deliver or fails to

deliver on time. Furthermore, the credit risk related to settlement of securities trades can be divided into a principal risk and a replacement risk/market risk. These risks are described in more detail in Box 1.

COUNTERPARTY RISK ON SETTLEMENT OF SECURITIES TRADES

Box 1

Counterparty risk related to settlement of securities trades can be divided into credit risk and liquidity risk.

*Credit risk* related to settlement of securities trades can be broken down by principal risk, replacement risk and other credit risks. A principal risk arises if the buyer and seller in a securities trade do not deliver simultaneously. The party that performs delivery first incurs a credit risk vis-à-vis the counterparty corresponding to the agreed value of the principal. The principal risk increases with the period between the planned deliveries.

*Replacement risk* is the risk of incurring a loss because the counterparty fails between the time of conclusion and settlement of the securities trade so that the trade cannot be executed. A buyer of a security will lose any unrealised profit if the market price has gone up in the meantime. In the same way, a seller of a security will incur a loss if the price has gone down. The replacement risk increases with the period between conclusion and settlement of the trade, and with fluctuations in market price.

Other credit risks related to settlement of securities trades include the participants' credit risk vis-à-vis the settlement bank, i.e. the bank in charge of exchanging payments. Furthermore, credit risk may arise between direct and indirect payment participants. A central securities depository (CSD) may also incur a credit risk vis-à-vis the participants if it grants securities lending or other credit facilities in order to facilitate settlement.

*Liquidity risk* is the risk of incurring a loss because liquidity or securities are not received at the expected time. Such loss may occur if the liquidity or securities have already been deployed. In that situation, the seller in a securities trade may have to borrow liquidity or sell assets at short notice, which often entails costs. In the same way, the buyer may have to borrow an equivalent security in the market in order to honour a resale with same-day value.

### 2.3. Limitation of risks in central securities depositories

Settlement<sup>4</sup> of securities takes place in central securities depositories (CSDs), in Denmark VP Securities Services (VP), where the securities are registered electronically. Securities issuance and trades are thus registered in CSD accounts. This has enabled fast and efficient settlement of securities trades.

Principal risk in CSDs is eliminated by the simultaneous exchange of securities and payments, known as delivery versus payment or DvP. Replacement risk is limited by settlement relatively soon after conclusion of the trade. According to the recommendations, securities trades should be settled within three days of their conclusion. This is known as a T+3 settlement cycle (T being the trade day).

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<sup>4</sup> Settlement is the exchange of services in fulfilment of the parties' obligations. The settlement is preceded by a compilation thereof, which is called clearing.

CSDs, including VP, have limited the liquidity risk by introducing rules and procedures to ensure that as many trades as possible are settled on the agreed day. Similarly, central bank liquidity facilities, which ensure, among other things, that sufficient intraday liquidity is available to the financial system for payment purposes, reduce the liquidity risk.

Section 5.1 below describes settlement in VP, including DvP settlement procedures and the settlement cycle, and Box 6 describes Danmarks Nationalbank's liquidity facility.

The remaining replacement risk can almost be eliminated by introducing a CCP. Similarly, liquidity risk can be eliminated through a CCP, if the latter is able to provide its service on time. As a rule, this will require the existence of an efficient securities lending facility operated in relation to the settlement, cf. Box 3. Such a facility will enable the CCP to borrow securities immediately after a participant has defaulted on its obligation to deliver securities to the CCP.

#### **2.4. Conclusion**

Trades on electronic trading platforms are often concluded with an anonymous counterparty, and consequently the participants do not know in advance the counterparty risk involved. However, electronic settlement in CSDs limits the risk, which may be further limited or completely eliminated by clearing through a CCP.

### **3. Functionality and international framework for CCP activities**

Over the past many years, market practices in Europe have been increasingly harmonised, and at the same time a consolidation of stock exchanges and other marketplaces and between CSDs has taken place. This process is far from complete, however, and the practices thus remain highly diverse, including as regards CCPs. For example, there are many markets where CCPs have not yet been introduced. In other markets, CCPs cover several submarkets, including both derivatives and spot markets. The consolidation of stock exchanges, etc. is also reflected on CCPs, many of which conduct cross-border activities. Section 4 explains the differences in more detail through a general description of different European CCPs, while this section focuses on common features and the common regulations governing the CCPs.

#### **3.1. Functionality of central counterparties**

##### **3.1.1. Definition**

By definition, a central counterparty enters into a trade between the buyer and the seller, thus acting as the seller in relation to the buyer and vice versa. This means that the CCP does not itself take positions, as each sale of a security corresponds to a similar purchase, etc., but by entering into a trade the CCP will act as a guarantor for both parties' fulfilment of their obligations. If one of the parties does not deliver its service, the CCP's obligation to the other party obviously continues, i.e. to deliver payment to the seller or securities to the buyer. A CCP thus undertakes the settlement risk on the trade in question, and if the CCP covers an entire market, the entire settlement risk is therefore concentrated on the CCP.

##### **3.1.2. Netting**

A common feature of CCP activities is the netting effect, whereby the participants' opposite claims are reduced by setting off, cf. Box 2. If a CCP applies bilateral netting between itself and the participants, each participant's position will be reduced so that an amount or a number of securities with a given ID code/ISIN code<sup>5</sup> will either have to be provided or received. The consequence of this bilateral netting between the CCP and all participants is that the various parties'

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<sup>5</sup> An ID code or ISIN code (International Securities Identification Number) is an ISO standard (6166) assigned to a security to identify it. The code is normally assigned through a national numbering agency (in Denmark, VP Securities Services).

trades are actually set off by multilateral netting, as a participant's net position in relation to the CCP is in fact an expression of that participant's aggregate net position in relation to the other participants. The introduction of a CCP in a market will therefore both reduce the participants' gross obligations and move clearing activities from a clearing centre or CSD to the CCP. This will cause a significant drop in the number of trades for settlement in the existing clearing centre or CSD.

In many markets, including the Danish market, netting is already part of the settlement, cf. BIS's settlement model 3, which includes netting of both the cash leg and the securities leg (by ID code/ISIN code). The introduction of a CCP in such a market has no liquidity-saving effect, but the entry of the CCP brings forward the time when netting takes place from the time of settlement in a CSD (typically three days after the trade day – also known as T+3) to the time when the CCP enters the trade. This will normally take place immediately after the conclusion of the trade. Netting in relation to the final settlement is known as payment netting, while netting in relation to e.g. a CCP is known as obligations netting, cf. Box 2.

| BILATERAL AND MULTILATERAL NETTING  |                   |                   |                 | Box 2           |
|---|-------------------|-------------------|-----------------|-----------------|
| <b>BILATERAL NETTING BY NET COMPILATION OF RECEIVABLES AND OBLIGATIONS BETWEEN A AND B</b>  |                   |                   |                 |                 |
|   | Gross receivables | Gross obligations | Net compilation |                 |
| A .....   | 20                | 12                | 8               |                 |
| B .....   | 12                | 20                | -8              |                 |
| <b>MULTILATERAL NETTING BASED ON THE BILATERAL POSITIONS/PAYMENTS BETWEEN A AND B AND A THIRD PARTICIPANT, C</b>  |                   |                   |                 |                 |
|   | A                 | B                 | C               | Net compilation |
| A .....   |                   | 8                 | -5              | 3               |
| B .....   | -8                |                   | 10              | 2               |
| C .....   | 5                 | -10               |                 | -5              |
| <p>The bilateral netting between A and B can illustrate both payment and obligations netting between two parties. Payment netting sets off A's obligation, while B's obligation is reduced to 8 so that the aggregate account can be settled by B's payment thereof.</p> <p>With regard to netting of claims, bilateral netting can illustrate an account between a CCP and a participant, i.e. a compilation of the aggregate counterparty risk between them. For this purpose, the unrealised losses and gains on individual unsettled trades are calculated by relating their current value, i.e. their current market price, to the price at the time of the trade as described in section 2. The example includes two trades, A having earned 20 on one and lost 12 on the other. If A is the CCP, its counterparty risk on the participant is 8. If the participant defaults, the CCP can effect final settlement by netting by close out and charge the participant's insolvent estate 8, or in practice further set off the amount against the participant's collateral vis-à-vis the CCP.</p> <p>Taken as one, the bilateral and multilateral netting for participants A, B and C can illustrate the liquidity savings achieved by the participants in a market because their payment obligations are reduced by payment netting so that each participant must either provide or receive an amount in relation to settlement of their aggregate securities trading. The netting of claims illustrates how their counterparty risk is continuously reduced by the entry of a CCP. As will be seen, A's counterparty risk is reduced from 8 to 3 and B's counterparty risk is reduced from 10 to 2, while C's risk is eliminated through a reduction from 5 to zero.</p> |                   |                   |                 |                 |

How participants report to a CCP typically depends on the market segment. In a derivatives market and other marketplaces with electronic trading systems, reporting most often takes place directly from the trading platform to the CCP when the trade is concluded. In such cases, the CCP incurs a settlement risk from the time of the trade, and the parties do not incur a counterparty risk vis-à-vis each

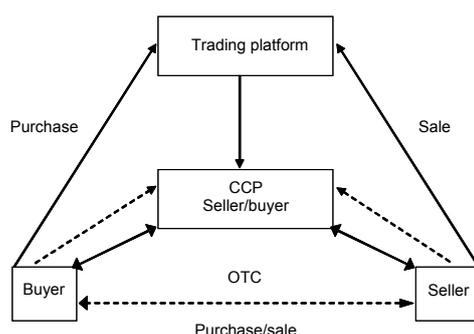
other at any time. This is known as an open offer system, based on the CCP's standing offer of entering into the participants' trades.<sup>6</sup>

For OTC trades, e.g. trading between two parties by telephone, a CCP will obviously not be able to enter into the trade until both parties have reported it to the CCP. The original purchase agreement between the two parties will then be replaced by the parties' opposite purchase agreements with the CCP. The cancellation of the original agreement and the simultaneous conclusion of the new agreements are known as netting by novation. In such a situation, the parties incur a counterparty risk vis-à-vis each other until both parties have reported the trade to the CCP. Thus, the efficiency of the CCP's risk reduction depends on how soon the parties are able to report the trade.

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CCP ENTERING INTO OPEN OFFER SYSTEM AND OTC TRADE

Chart 1



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Note: Two participants in a market buy and sell a security on a trading platform. The trade is reported from the trading platform to the CCP, which immediately enters into the trade. The broken line illustrates a similar trade in the OTC market where the CCP does not enter into the trade until the parties have reported it. In both cases, the consequence of the CCP entering into the trade is that it will act as the seller in relation to the buyer and vice versa.

The netting effect, which reduces the participants' positions vis-à-vis each other and thus the settlement risk in general, increases as the CCPs expand their business area. This expansion may consist in increased cross-border operations and in CCPs covering more national market segments at domestic level. The latter is known as cross-product netting, whereby CCPs cover a range of different products. In connection with cross-border operations, and especially cross-product netting, the participants may incur risks that are of no

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<sup>6</sup> See Bliss and Papathanassiou (2006) and Ripatti (2004).

concern to them; for example, participants in the bond market may incur risks from the derivatives market where the longer settlement periods involve greater risks. Such risks will only materialise, however, if a CCP is unable to sustain any losses incurred as a result of a participant's default, cf. below.

### **3.1.3. Anonymity**

The entry of a CCP at the time of the trade in an open offer system also entails that the anonymity existing before the trade is preserved after its conclusion, cf. section 2.

The CCP supports the anonymity of the system as the two participants concluding the trade will not subsequently obtain knowledge of their counterparty.

The market structure affects trading in the secondary market. There is a risk that information about the counterparty is disseminated (wittingly or unwittingly) to other participants, thus giving rise to strategic market implications. If it becomes generally known that a market participant has bought a large number of securities, the other participants will act accordingly in order to benefit from this. This implies that the participants will avoid making the same amount of risk available, which will have a negative impact on market liquidity.

### **3.2. International standards for risk management in CCPs**

A market and its participants will only achieve the intended risk reductions if, by way of its organisation and financial resources, a CCP is able to handle default on the part of its participants.

Otherwise, the concentration of risk on the CCP may jeopardise financial stability by causing problems in the CCP to spread to the other participants. For that reason, the 2004 BIS Recommendations mentioned in the introduction apply to CCPs.

The 15 international recommendations for CCPs address the different risks that characterise CCP activities and explain how to take this into account when organising a CCP. Due to the international nature of the standards, they are compulsory for all existing CCPs worldwide. Thus, the standards indicate a kind of common global regulation of CCP activities while outlining how CCPs are organised in general. The Recommendations are reproduced in Appendix 2.

### **3.2.1. Legal framework and public regulation**

According to Recommendations 1 and 6, all activities of a CCP should be clearly regulated and enforceable in every conceivable situation, including vis-à-vis foreign participants and in situations of default and bankruptcy. In this connection the legal basis should ensure that a CCP is able to settle finally its positions vis-à-vis a participant that fails on the basis of the bilateral netting described above (netting by close out). The relevant legal basis should give a CCP good opportunity to protect its claims through collateral, including margin requirements, cf. below.

Key aspects of a CCP's legal basis should be publicly available, and, in accordance with Recommendation 14, a CCP should provide market participants with sufficient information for them to identify and evaluate accurately the risks and costs involved. This supports the participants' ability to carry out efficient risk management.

Recommendation 15 stipulates that CCPs should be subject to transparent and effective regulation and oversight<sup>7</sup> by central banks. It appears from Recommendation 1 concerning the legal framework that a CCP and the authority granting its licence must ensure that the CCP obtains the best possible legal protection. For EU member states, this implies that in practice<sup>8</sup> CCPs must be covered by the Finality Directive<sup>9</sup>, the main objective of which is to protect settlement in payment and security settlement systems, including settlement by netting.

### **3.2.2. Operational requirements**

According to Recommendation 8, a CCP should ensure operational stability through reliable and secure systems with adequate capacity. Business continuity plans and backup facilities should ensure that, in the event of system failure, a CCP is able to reopen and complete its operations on time. It is stated that, ideally, backup systems should commence processing immediately, and that a number of countries have decided that a CCP should be capable of resuming operations within 2 hours of system failure. In practice, this implies that a CCP must have two-centre operation, or what is known as a hot backup centre, i.e. a secondary centre that operates in parallel with the

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<sup>7</sup> See Danmarks Nationalbank, Payment Systems in Denmark, 2005.

<sup>8</sup> See Bliss and Papathanassiou (2006). In drafts for the ESCB/CESR standards a designation under the Finality Directive is compulsory.

<sup>9</sup> See Danmarks Nationalbank, Payment Systems in Denmark, 2005.

primary system and supports business continuity in the event of failure.

### **3.2.3. Hedging of counterparty risk**

Recommendations 2 to 5 state how a CCP should handle the concentration of settlement risk involved when it enters into the participants' trades.

According to Recommendation 2, a CCP should require the participants to have sufficient financial resources to meet their obligations to the CCP, and this should be monitored on an ongoing basis. Thus, a CCP may require e.g. that the participants are subject to financial supervision, meet minimum capital requirements and have a certain credit rating.

It follows from Recommendations 3 and 4 that a CCP should limit the potential risk in case of the participants' default. The counterparty risk should be measured at least once a day. The CCP may do this by performing an overall compilation of all unsettled trades at the market price. The result shows the exposure of the CCP, which should normally be limited through margin requirements, whereby the participants pledge collateral for their positions. Otherwise, the CCP must limit its risk in another way in order to be able to maintain uninterrupted operation under normal market conditions. Furthermore, a CCP should be able to continuously assess the counterparty risk during the day, e.g. in connection with greater volatility in the market.

The most common method by which CCPs allow for counterparty risk is to impose margin requirements on the participants. If necessary to protect itself against risks, a CCP must use other forms of margins in addition to the routine margin, which is generally called at a certain time of the day. For example, this may be a price driven margin which is called in connection with major changes in market prices or a margin related to the participants' positions.<sup>10</sup>

In general, the margin should, under normal market conditions, cover a potential loss incurred in the period between the latest margin adjustment and a participant's default. The glossary of the report containing the BIS Recommendations defines normal market conditions as price movements that produce changes in exposures that are expected to breach margin requirements or other risk control

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<sup>10</sup> Cf. Wendt (2006).

mechanisms only 1 per cent of the time, that is, on average on only one trading day out of 100.

As regards the assessment in this paper of the pros and cons of establishing a CCP in relation to spot trade, it should be emphasised that according to the report it is not necessary for a CCP that only covers a spot market to use margin requirements. Alternatively, the CCP may limit the trading volume of the individual participants or otherwise limit their position build-up vis-à-vis the CCP.

According to Recommendation 5, a CCP should maintain sufficient financial resources. As a minimum, a CCP should be able to withstand a default by the participant to which it has the largest exposure in extreme but plausible market conditions.

A CCP must define the contents of extreme market conditions itself, but it must take into account the historically most volatile periods in the market concerned. Against this background, a CCP must prepare a stress test to be revised at least once a year and according to which stress testing is to be performed on a monthly basis. Both the participants and the authorities must be informed thereof.

In addition to its equity, a CCP's capital base may consist of capital contributed to a guarantee fund, of guarantees from the participants, loss-sharing agreements, insurance arrangements, etc. If a CCP is under an obligation to provide its services faster than it is possible to turn the above into liquid assets, the CCP must take this into account, e.g. by obtaining a binding bank credit line.

#### **3.2.4. Liquidity risk and securities lending facility**

According to Recommendation 10, a CCP should clearly state its obligations with respect to physical deliveries. In spot trades this means whether in case of a participant's default the CCP is under an obligation to deliver securities to the buyer/payments to the seller, or if the CCP is only under an obligation to cover the non-defaulting party's losses as a result of non-delivery. In other words, the protection of the market participants provided by a CCP may range from insuring them against financial losses to an actual guarantee of timely delivery. If a CCP is subject to an actual guarantee of delivery, it must be capable of managing the ensuing liquidity risk. In such cases, CCPs normally require that market measures be taken to ensure high settlement rates, e.g. that the participants should be members of a compulsory securities lending facility, cf. Box 3.

There may be several reasons why market participants need a security on the value date. They may be market makers who, as described in section 2, have undertaken to buy and sell certain securities on an ongoing basis, or participants who have bought a security and resold it for settlement on the same value date (back-to-back trade), but find that their counterparties are unable to deliver. This creates a demand for borrowing securities that will enable participants to meet their obligations on time.

This demand is accentuated by the fact that, in addition to harming the seller's reputation in the market, late delivery is often disadvantageous to the seller, because the buyer is entitled to the interest on the purchase sum until delivery. The reason is that the purchase price remains the same, including as regards accrued interest. If the price of borrowing a security is below the day-to-day interest rate, it will be cheaper for a participant to borrow the security than to perform late delivery. It has been established that when the price of securities lending approaches the cost of borrowing, the settlement rates in the CSDs go down, cf. Fleming and Garbade (2005).

To meet this demand, major participants in a market may offer securities lending in the most traded securities. In such an arrangement, securities lending is normally offered against collateral in the form of e.g. repos where the borrower buys the security in a spot trade and simultaneously sells it back to the lender on a forward basis. The use of repos also ensures that ownership is transferred to the borrower who then has free disposal of the securities, including hedging a delivery obligation in connection with a sale thereof.

With a view to reducing the number of trades that are not settled on time, CSDs may offer a centralised securities lending facility on a commercial basis. Participants who want to lend securities can join such facilities. Subsequently, the CSD can lend the securities to participants who are unable to meet their delivery obligations on time. To limit the lenders' risk, it is normal procedure for such facilities that the borrowers provide securities as collateral for their obligations to return the borrowed securities.

When securities lending is organised by a CSD, operating advantages are normally obtained, because securities lending can be integrated in the settlement process. This often enables a greater degree of process automation, also known as STP or straight-through processing. Furthermore, this also allows better interaction between supply and demand. If a counterparty fails to deliver in a back-to-back trade, cf. above, the lending facility may be activated immediately and ensure timely settlement. If the situation is reversed, and the counterparty delivers on time, participants expecting late delivery avoid having to borrow a security that will not be needed.

### 3.2.5. Other requirements

According to the remaining recommendations, a CCP should eliminate or limit its settlement risk by ensuring that the settlement asset is central-bank money or by using several private settlement banks (Recommendation 9). Any risks involved in creating links to enable participants in a market to participate in another market through their CCP should be managed and monitored (Recommendation 11). In addition to being safe and secure, CCPs should also be cost-effective for the users (Recommendation 12). Finally, the governance arrangements in connection with a CCP should be clear and transparent to fulfil public interest requirements and to support the objectives of owners and participants (Recommendation 13).

### 3.3. Conclusion

If a CCP is established in a market, settlement risk is concentrated because the CCP becomes the counterparty of the participants in the settlement. The netting effect limits the participants' aggregate exposure vis-à-vis each other at the time when the CCP enters into the trades, which often takes place at the time of their conclusion or shortly thereafter. Thus, the participants' aggregate counterparty risk vis-à-vis each other, which is assumed by the CCP, is reduced compared to the original risk.

To the extent that the CCP manages its risks efficiently, e.g. by observing the recommendations, the market participants' counterparty risk will, as a rule, be reduced to such an extent that it may almost be considered to be eliminated. For the same reason, the counterparty risk vis-à-vis CCPs is estimated at zero in the new, internationally approved capital-adequacy rules (the Basel II Capital Accord)<sup>11</sup>, so that there is no capital requirements for counterparty risk when trades are made through a CCP.<sup>12</sup> The same applies to spot trades settled on a DvP basis.

In addition to the settlement risks being almost eliminated, the establishment of a CCP may also increase market efficiency as the principle of anonymity is maintained, cf. section 3.1.3.

Obviously, the establishment of a robust CCP that meets the standards is not cost-free. Likewise, there are current costs, including the participants' costs in relation to pledging collateral for their positions in the form of margin requirements, so-called opportunity costs, or observance of other forms of risk management.

Thus, the discussion of whether to introduce a CCP in a particular market mainly centres on balancing the benefits of eliminating replacement risk against the costs related to introducing the CCP. Section 5 describes such considerations regarding the introduction of a CCP in the Danish market.

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<sup>11</sup> The new Basel II minimum capital requirements were implemented in the EU with the new Capital Requirements Directive (CRD), which entered into force on 1 January 2007. Danmarks Nationalbank (Financial stability, 2006) reviews different methods of calculating the capital requirement under the new rules.

<sup>12</sup> See also Danish Executive Order on Capital Adequacy No. 10113 of 22/12/2006. With regard to central counterparties, section 46 states: The exposure at default is set at zero for financial derivatives, securities financing instruments and forward contracts concerning non-rejected contracts entered into with a central counterparty, where all participants in the central counterparty's systems pledge full collateral for their exposures on a daily basis.

#### 4. CCP activities in the EU member states

Traditionally, CCP activities are known from derivatives trading, where the settlement period is longer or more or less part of the derivative product. In that area, CCPs have been very well suited for handling the considerable derived counterparty risks.

In connection with the introduction of electronic trading systems by stock exchanges and other marketplaces, cf. section 2, where the participants do not choose their own counterparties, the CCPs have expanded their activities in recent years to cover the spot market. This trend is particularly evident in share trading, which continues to be dominated by the stock exchanges, and to some extent in bond trading, a considerable part of which has migrated to electronic trading platforms in recent years.

##### 4.1. Overview of CCPs in the EU

There are nine CCPs in the EU today<sup>13</sup>, cf. Box 4.

| CENTRAL COUNTERPARTIES IN THE EU AND MARKETS/STOCK EXCHANGES COVERED BY THEM   |             |             |                         |  | Box 4 |
|--|-------------|-------------|-------------------------|--|-------|
| CCP  | Derivatives | Spot market | Main stock exchange     | Share of stock trading in the EU in 2005 |       |
| <i>CCP Austria GmbH</i><br>Austria   | x           | x           | Wiener Börse            | 0,3                                      |       |
| <i>LCH.Cleanet SA (French)</i><br>Belgium<br>France<br>Netherlands<br>Portugal | x           | x           | Euronext                | 18,4                                     |       |
| <i>OMX Derivatives Markets (Swedish)</i><br>Denmark<br>Finland<br>Sweden       | x           |             | OMX                     | 5,9                                      |       |
| <i>Eurex Clearing AG (German)</i><br>Germany<br>Ireland                        | x           | x           | Deutsche Börse          | 12,1                                     |       |
| <i>ADEH Athens Derivative Exchange Clearing House</i><br>Greece                | x           |             | Athens Exchange         | 0,4                                      |       |
| <i>KELER</i><br>Hungary  | x           | x           | Budapest Stock Exchange | 0,2                                      |       |
| <i>CC&amp;G Cassa De Compensazione e Garanzia S.p.A.</i><br>Italy              | x           | x           | Borsa Italiana          | 8,2                                      |       |
| <i>MEFF Renta Fija og Renta Variable</i><br>Spain                              | x           |             | Spanish Exchanges       | 9,9                                      |       |
| <i>LCH.Cleanet Ltd</i><br>UK   | x           | x           | London Stock Exchange   | 35,9                                     |       |

Source: London Economics (2005), Wendt (2006) and the Federation of European Securities Exchanges, December 2005.

<sup>13</sup> This assumes that the CCPs LCH.Cleanet SA and LCH.Cleanet Limited, which are both part of LCH.Cleanet Group Limited, are included separately.

Obviously, this Box provides only a general picture of CCP activities in the EU and the markets in which these CCPs operate. For example, it does not show that MEFFCLEAR operates as CCP for SENAF<sup>14</sup> in relation to repos in Spanish government securities. Nor does it show that the Polish CSD, KDPW, runs a CCP-like operation on the Polish derivatives market, as KDPW does not legally enter as a party between the two parties whose counterparty risk is thereby reduced. The picture is further complicated by the fact that, as Box 4 illustrates, the CCPs often conduct cross-border activities, and in addition, e.g. LCH.Clearnet Limited acts as CCP for various MTS trading platforms, including for the Dutch, Belgian and German markets. CCP activities in the bond markets are described in section 4.3. Finally, the CCPs link to each other, e.g. by allowing a CCP to participate as a clearing member in the clearing at another CCP. This means that a cross-border participant in a market can use its local CCP, which, through its membership of the CCP on the market concerned, enters into the trade on behalf of that participant.

Since the CCPs' core area has been derivatives trading, all nine CCPs guarantee the settlement of derivatives in all the 15 markets on which they operate. Similarly, 10 of the spot markets are covered by the activities of 6 CCPs. So while the CCPs cover only 10 of the markets in the 25 EU member states, they do cover most of the large markets, however. Box 4 will be discussed further below.

#### **4.2. CCP activities on the share markets**

It is characteristic of share trading that it continues to take place on the stock exchanges. In 2003, 90 per cent of all trades in Europe, or 70 per cent of the volume traded, took place on stock exchanges.<sup>15</sup> On most of the large share markets in the EU, CCP clearing is offered, cf. Box 4, specifically in relation to trades on the London Stock Exchange (LSE), Euronext, Deutsche Börse and Borsa Italiana. In 2005, these stock exchanges accounted for almost 75 per cent in volume terms of share trading on EU stock exchanges. In addition, shares traded on the Virt-X exchange in the UK, on which the European blue-chip shares are listed, are also cleared in CCPs in LCH.Clearnet Limited and Swiss SIS x-clear AG, respectively, as requested by the participants. When measured in the same way,

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<sup>14</sup> Sistema Electrónico de Negociación de Activos Financieros, Agencia de Valores, SA, which operates an electronic trading platform for securities, including repos in Spanish government securities.

<sup>15</sup> Deutsche Börse Group (2005).

share trading on Virt-X amounted to 5.6 per cent of total trading in the EU in 2005, which means that trades on stock exchanges cleared in CCPs include more than 80 per cent of share trading on EU stock exchanges. It should be noted, however, that in that year, according to the Federation of European Securities Exchanges, almost two thirds of share trading on e.g. LSE, was in the form of negotiated deals. According to London Economics, trades completed outside the LSE trading systems are not included in the CCP clearing, as such trades are reported directly to the CSD in the UK (Euroclear UK & Ireland Limited) or to the international CSD, Euroclear Bank. Incidentally, participants in both LCH.Clearnet SA and Eurex AG are able in certain cases to report OTC trades for CCP clearing.

#### **4.2.1. Large share markets without CCPs**

The large share markets that do not offer CCP clearing are the Spanish stock exchanges and OMX, which accounted for 9.9 per cent and 5.9 per cent, respectively, of share trading on EU stock exchanges in 2005.

In an assessment of the Spanish securities settlement system<sup>16</sup> in relation to the above recommendations, the pros and cons of establishing a CCP have been analysed. The analysis concluded that the establishment of a CCP would not lead to a net gain for the Spanish market. In this connection it should be noted that relatively few trades are not settled on time and that in general participants have easy access to managing their settlement risk. Similarly, there is limited demand for CCP clearing on the Spanish repo market in government securities where MEFFCLEAR operates as CCP, cf. section 4.1, as only about 3 per cent of the total market was cleared through the CCP in 2005.

In an analysis from 2002, Sveriges Riksbank<sup>17</sup> advocates the introduction of a CCP on the Swedish market, possibly integrated with an existing CCP, provided that the market participants find this cost-effective. According to Sveriges Riksbank,<sup>18</sup> both the Stockholm Stock Exchange and the Swedish CSD have subsequently assessed whether the prerequisites for establishing a CCP existed. The Stockholm Stock Exchange assessed whether the existing CCP, OMX Derivatives Markets, was able to expand its business area to the spot market for shares. The conclusion in both cases was that

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<sup>16</sup> International Monetary Fund (2006).

<sup>17</sup> Sveriges Riksbank (2002).

<sup>18</sup> Sveriges Riksbank (2005).

there was no business case for this. The Stockholm Stock Exchange already offers CCP activities in connection with its bond trading platform. However, most of the bond trades are OTC, and the CCP is rarely used for trades concluded on the trading platform.

### 4.3. CCP activities in the bond markets

#### 4.3.1. Bond markets and trading via MTS

Traditionally, bonds have been traded outside the stock exchanges. According to Deutsche Bank,<sup>19</sup> 95 per cent of bond trades in Europe take place outside the stock exchanges. Trades are concluded on electronic trading platforms and OTC. Government bonds and certain benchmark bonds such as mortgage-credit-type covered bonds are often traded electronically, while other bonds are mainly traded OTC. This reflects that turnover in the government bond markets is usually high, while investors hold other bonds for longer periods of time and in many cases until maturity.

Deutsche Bank estimates that in 2005 approximately 75 per cent of all government bond trades in Europe were completed via electronic trading systems, corresponding to approximately 50 per cent of the turnover in terms of value. The MTS system was the dominant trading platform with a market share of more than 70 per cent of the government bond spot market. MTS is an Italian system in which government bonds can be traded in the national MTS markets as well as on EuroMTS, where the most liquid government bonds (benchmark bonds) can be traded together with other liquid bonds such as the benchmark bonds described above (see Box 5).

| MTS   | Box 5 |
|---|-------|
| <p>The MTS (Mercato dei Titoli di Stato) system was introduced in 1988 by the Central Bank of Italy in cooperation with the Italian Ministry of Finance. In 1994, it was extended into the system we know today. In 1997, it was privatised as MTS S.p.A., and in 1999, it established EuroMTS where the major European benchmark securities are traded. MTS S.p.A. manages the electronic trading platform called Telematico and has ownership interests in local MTS companies that use the trading platform. In 2005, a consortium consisting of Euronext and Borsa Italiana acquired control with MTS S.p.A.</p> <p>In 2000, MTS Credit was established as a trading platform for bonds other than government bonds. MTS also operates other trading platforms for various special market segments.</p> <p>Today, the MTS trading platform is used in the following national market segments in the EU: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands (MTS Amsterdam), Poland, Portugal, Slovenia and Spain.</p> |       |

Source: London Economics, Cheung and Danmarks Nationalbank: Danish Government Borrowing and Debt 2006.

<sup>19</sup> Deutsche Bank (2005).

The largest markets for government bonds in the EU are in Italy, Germany and France, which are exceeded only by the USA and Japan worldwide. In 2004, Italy had outstanding government debt of 1,495 billion US dollars. The corresponding figures for Germany and France were 1,193 billion dollars and 1,176 billion dollars, respectively. They were followed by the UK with slightly lower outstanding government debt of 674 billion dollars.<sup>20</sup>

#### **4.3.2. CCP activities in the bond markets**

CCP clearing is offered on the three largest government bond markets in the EU, since the UK is the only one of the above markets that does not offer clearing through CCPs.

Trading in Italian government bonds on MTS S.p.A. and EuroMTS can be cleared in both CC&G and LCH.Clearnet SA, which are mutually linked, cf. the description of links in section 4.1. In Germany, LCH.Clearnet Limited also acts as CCP for trades on MTS Deutschland, but government bond trades are concluded mainly on the Eurex Bonds GmbH trading platform. Here, the CCP clearing takes place in Eurex Clearing AG. LCH.Clearnet SA is also in charge of CCP clearing in relation to MTS France. In addition, a number of national market segments where settlement takes place in Euroclear Bank and Clearstream International offer CCP clearing through LCH.Clearnet Limited<sup>21</sup>.

As a general rule, it is optional for the participants whether they want to clear their bond trades through the related CCP. Thus, a CCP will only be used if requested by both parties to the trade.

As is the case for share trading, CCP clearing is in most cases offered on the EU bond markets, although the related settlement risk is considerably lower than for shares.

#### **4.4. Conclusion**

Share trades in the EU usually take place via the electronic trading systems of the stock exchanges, while bond trades on the most liquid markets are often concluded on electronic trading platforms. Trading via both share and bonds systems usually involves CCP clearing. However, there are still a number of important markets in the EU

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<sup>20</sup> International Financial Services London (2005).

<sup>21</sup> Austria, Finland, Ireland and the Netherlands. In Belgium, where settlement takes place in the National Bank of Belgium and not in Euroclear Bank or Clearstream International, LCH.Clearnet Limited also acts as CCP.

where CCP clearing is not offered, and the same applies to many smaller markets.

## 5. Introduction of a CCP in Denmark

In Denmark, issuance of shares and bonds, etc., including those listed on OMX Nordic Exchange Copenhagen (OMX Copenhagen), takes place via a CSD, in practice VP. Danish securities and turnover in Danish securities are thus registered and cleared electronically in VP. VP meets the standards mentioned in section 1 for securities settlement systems, and the VP functionality generally corresponds to that of the other CSDs in the EU. Like e.g. the CSDs in the other Nordic countries, VP differs from its EU counterparts in one respect, however, as securities accounts in VP are normally opened at individual investor level.<sup>22</sup> Approximately 3.2 million securities accounts are registered in VP. The use of omnibus accounts, where the ownership of securities appears from internal investor registrations at custodian banks, is therefore not common in Denmark. Foreign VP participants, including foreign CSDs that have established links to VP, usually set up omnibus accounts.

In the Danish market, mainly two electronic trading platforms, owned by OMX and MTS, respectively, are used for trading shares and bonds. The daily trading volume on these platforms is relatively modest in relation to the total turnover in the market, which on average exceeds kr. 120 billion per day. Most trading thus takes place OTC, which also applies to the repo market.

There is no central counterparty in relation to the trade in the Danish spot market. Introduction of a CCP has been discussed several times in various forums, both nationally and at the Nordic level. The discussions have taken place between market participants and stock exchanges and CSDs.

So far the conclusion has been that the benefits of establishing a CCP do not justify the costs, which are estimated to be considerable. This applies especially at the national level, where the benefits of a CCP are fewer than at the Nordic level, cf. below.

This section provides a general description of trading and settlement in the Danish market, followed by an illustration of how a CCP could be established, as well as the pros and cons thereof.

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<sup>22</sup> Besides the Nordic countries, Bulgaria, Estonia, Greece, the Czech Republic and Slovenia apply individual investor registration.

## **5.1. The functionality of the Danish market**

### **5.1.1. Turnover in the Danish securities market**

The Danish stock-exchange market is primarily order-driven, cf. the description in section 2. OMX Nordic Exchange Copenhagen, which forms part of the Swedish OMX Group, is a member of the Norex Alliance, a joint Nordic and Baltic stock-exchange alliance. In all the involved countries the Saxess trading system is used, and within the OMX an effort is being made to create a single cross-border securities market.

At the end of 2007, OMX Copenhagen had 60 members, of which 56 were members of the share market. Of those, 28 were foreign participants, i.e. remote members, who participate in the market without being domiciled in Denmark. The remaining 28 members of the share market were either domiciled or had set up a branch in Denmark. 25 members participated in the bond market, all of which were domiciled in Denmark.

The average daily share turnover at OMX Copenhagen amounted to just under kr. 4.2 billion in 2006.<sup>23</sup> This amount primarily comprises trades in Saxess, but also includes trades reported to OMX Copenhagen pursuant to the Executive Order on Reporting of Transactions involving Securities Listed on a Stock Exchange. In VP, where turnover indicates transfer of securities from one account to another, share turnover amounted to kr. 4,198 billion in 2006. As there were 252 trading days that year, this is equivalent to daily turnover of kr. 16.7 billion. A considerable part thereof was turnover of mutual fund shares primarily between a securities dealer, e.g. a bank, and its customers.

Danish government securities are traded on the MTSDenmark trading platform. At the beginning of 2007, there were 18 participants, mainly large international banks. This market segment is quote-driven as the participants have an obligation towards Government Debt Management at Danmarks Nationalbank to continuously quote bid and ask prices for a number of government securities. In 2006, the average daily turnover on MTSDenmark was approximately kr. 1.4 billion, and there were less than 50 trades per trading day.

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<sup>23</sup> OMX Nordic Exchange Copenhagen 1 February 2007. The share turnover was extraordinarily influenced by the acquisition of TDC A/S in January 2006, which amounted to almost kr. 57.5 billion, corresponding to kr. 228 million per trading day.

The remaining trade in bonds, including both government and mortgage-credit bonds, mainly takes place OTC. In 2006, the average daily bond turnover amounted to approximately kr. 27.1 billion,<sup>24</sup> of which kr. 96 million was traded via OMX Copenhagen's trading system while the rest was reported to OMX Copenhagen.

When trading shares at OMX Copenhagen or trading government bonds on the MTS trading platform, the Danish market participants will only receive information about the counterparty after they have concluded the trade.<sup>25</sup>

The repo market<sup>26</sup> is also an OTC market. In 2004, the daily turnover amounted to approximately kr. 61 billion. Repos are used, among other things, as collateral for loans in the money market, i.e. usually for loans in kroner between banks with a term of less than one year. The repo will typically be a sell and buy-back transaction, consisting of a spot sale and a simultaneous forward purchase of securities. In practice, repos are primarily used in connection with securities lending. To comply with a wish to reduce the capital requirement, daily margin adjustment is becoming still more common.

During the 1st half of 2007 daily total bond turnover amounted to kr. 96 billion, of which 47 per cent took place between participants in the professional market.

The Danish securities market can thus mainly be described as a bond market, where both trading and repo transactions take place OTC. Bonds are usually less volatile than shares, which might indicate that the settlement risks in Denmark are limited. Section 5.3 provides an analysis of these settlement risks.

## **5.1.2. Settlement of securities trades**

### **5.1.2.1. Reporting of trades**

The first step in the settlement of a securities trade is for both securities dealers to report the trade to VP. For domestic participants this takes place immediately after the conclusion of the trade. After the reporting, VP checks that the data submitted is consistent, i.e. matches the details, and makes output data available to the parties.

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<sup>24</sup> OMX Nordic Exchange Copenhagen 1 February 2007.

<sup>25</sup> In connection with bond trades in the OMX trading system, the trading participants are generally known prior to a trade.

<sup>26</sup> Repos are repurchase agreements and cover both buy and sell-back transactions and sell and buy-back transactions based on securities.

Like other MTS platforms, MTSDenmark is based on central clearing instructions and STP. When a trade has been concluded between two market participants, the MTS system sends direct (SWIFT-based) information to the relevant clearing/settlement systems, which, apart from VP, are Euroclear Bank and Clearstream International.

From the Saxess trading system, trades may also be automatically transferred for clearing and settlement in VP via NOREX STP. This facility is primarily used by foreign participants with remote access to VP. The reason is that the registration at individual investor level in VP entails that the account controllers, which are primarily Danish, must enter further information prior to reporting to VP, so-called instruction enrichment, unless they trade for their own accounts.

#### **5.1.2.2. VP's settlement day reflects link to Euroclear**

VP's settlement day starts at 6 p.m. and ends just before 6 p.m. on the following banking day, which is also the value day. Within each settlement day, VP runs six net settlement blocks for securities trades, of which the first takes effect at 6 p.m.

The purpose of VP's many settlement blocks is to service a DvP link between VP and the international CSD Euroclear Bank. The latter has an omnibus account with VP. Securities issued in VP can thus be transferred to Euroclear. VP's first three nightly blocks correspond to Euroclear's two nightly settlement blocks so that back-to-back trades can be settled via the link, whereby purchased securities are resold with the same value date as they were purchased and are thus settled on the same day.

#### **5.1.2.3. VP's settlement cycle**

In accordance with a market convention, settlement primarily takes place in VP's first settlement block. The parties may agree on any settlement day from T+0 to T+365. The market convention is T+3. As stated, the main part of the settlement in VP takes place the night before the value date, i.e. already at 6 p.m. on T+2 if the value date is T+3.

In 2005, one of VP's customer groups assessed the possibility of shortening the settlement cycle to less than T+3. This was not deemed appropriate, partly out of concern for the cross-border participation in the trades that were not reported directly to VP from a trading platform. In connection with such trades, there may be considerable interaction, which has to fall into place, between the

investor's bank/broker and the investor's custodian bank before the custodian bank can ask its Danish agent, which participates in VP, to report the trade. In such cases, which may also involve different time zones, reporting often takes place on the value date itself immediately prior to settlement in one of VP's morning blocks. Of the share settlement, 13.1 per cent takes place during VP's morning blocks, corresponding to kr. 2.2 billion. A large part thereof must be assumed to derive from the cross-border participation at OMX Copenhagen. Compared to the turnover at the stock exchange, which amounts to just under kr. 4.2 billion, this is a considerable amount.

Usually, trades are reported to VP on the trade day, and, where this is not the case, on the following day, i.e. on T+1. A settlement cycle of T+3 is customary throughout most of the EU, partly due to the cross-border participation.

#### **5.1.2.4. VP's DvP settlement**

Prior to settlement, VP checks that the seller has sufficient cover for the sale of securities via a "securities check", and that the buyer has cover for the payment via a "cash check". Both checks are performed on a net basis, cf. BIS's DvP settlement model 3, as described in section 3.1.2. Settlement will only take place to the extent that there is cover. Thus, there is no principal risk for the VP participants, whose risk is limited to the replacement risk, cf. section 2.

| DANMARKS NATIONALBANK AS A LIQUIDITY PROVIDER  | Box 6 |
|--|-------|
| <p>To meet the demand for nightly settlements in the Danish financial market, Danmarks Nationalbank's monetary-policy day starts at 4 p.m. and ends the following day at 3.30 p.m. In the period in question, Danmarks Nationalbank makes an intraday facility available, whereby VP participants, against due collateral, are assigned unlimited settlement credits that must be covered by 3.30 p.m., i.e. at the end of the monetary-policy day. Prior to the implementation of each settlement block, Danmarks Nationalbank notifies VP of the balance in each participant's settlement account, i.e. its credit line.</p> <p>In addition, participants may draw on automatic collateralisation accounts including self-collateralisation. VP administers the collateral for these accounts as a sort of floating charge that can be based on the participants' book-entered holdings and on the inflow of purchased securities in a settlement block in VP.</p> |       |

The largest VP participants have linked their own portfolios of eligible bonds to the automatic collateralisation arrangement mentioned in

Box 6, which in practice gives them considerable excess liquidity. There is no central VP-administered securities lending facility. Securities lending thus takes place in the market, where Danmarks Nationalbank, among others, lends government and mortgage-credit securities under a lending facility.

The VP participants may reduce the replacement risk by settling their trades faster than T+3 or by settling a trade immediately after its conclusion, i.e. real-time gross settlement (RTGS), cf. BIS's DvP settlement model 1, but this possibility is only used to a limited extent.

## **5.2. Possible CCP models**

A CCP may be established in several ways and cover subsegments of the Danish market or the entire market. As previously mentioned, a joint CCP may be established for the entire Nordic market. In the following, a description of the various possibilities of establishing a CCP for the Danish market will be given, and subsequently the options for a Nordic CCP will be outlined.

### **5.2.1. A Danish CCP**

Section 50(4) of the Danish Securities Trading Act explicitly allows a clearing centre, acting as CCP, to enter as a party to trades in securities to ensure their execution. This makes it possible for VP to act as CCP for the Danish market, possibly via a separate company. VP could for instance enter into all reported trades or some of them as requested by the participants in connection with the matching of the trades.

For trades concluded OTC, VP will thus enter into the trades by way of netting by novation at the time when the parties report their trade, cf. section 3.1.2. Trades concluded on the MTSDenmark and OMX Saxess trading platforms may be transferred to VP in real time. Thus VP will be able to enter into the trades in connection with their conclusion in line with an open offer system, cf. section 3.1.2. In connection with trades concluded on the trading platforms, the output data that VP subsequently makes available to the participants merely states that the counterparty is VP, which will preserve the anonymity completely, cf. section 3.1.3.

Another possibility is a CCP established at the initiative of the trading platforms owners. MTSDenmark could e.g. invite tenders for the establishment of a CCP from existing CCPs, cf. e.g. section 4.3.2., from which can be seen that LCH.Clearnet Limited acts as CCP for

various MTS trading platforms. Similarly, OMX could offer to establish a CCP for the Saxess trading platform or expand the business area for the existing CCP, OMX Derivatives Markets, to the Danish spot market for shares. Besides, the opportunities for a CCP to establish itself in a market have improved, cf. the Code of Conduct<sup>27</sup> and the MiFID<sup>28</sup>.

Theoretically, the possibilities of introducing CCP clearing in the Danish market are, of course, numerous. The market participants could, for example, join forces with the above infrastructure participants to establish a CCP by way of a company. An existing CCP might even form part of it, providing know-how to the company, which in theory could also cover other parts of the Nordic markets.

### **5.2.2. A Nordic CCP**

Like OMX Derivatives Markets, a joint CCP covering all Nordic markets would bring economies of scale, as well as the possibility of reducing the participants' aggregate positions via cross-border netting, cf. section 3.1.2 and Box 2.

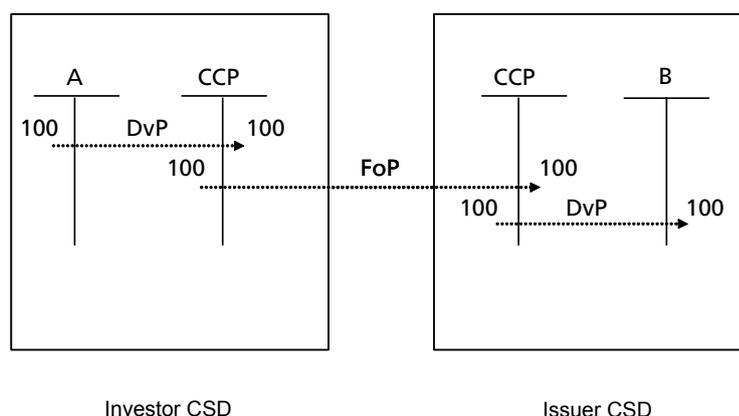
Moreover, a Nordic CCP may contribute to an integration of the Nordic markets by linking settlement in the national CSDs. Some of the Nordic CSDs have already established links to each other, so that securities issued in one CSD may be registered in the other Nordic CSDs and transferred back and forth. However, the present functionality does not allow simultaneous cash settlement, i.e. the links are FOP links (Free of Payment). Bilateral (mutual) direct FOP links have been set up between VP and the Swedish CSD, VPC, and the Icelandic CSD, VS. Each of these CSDs can, in addition to their own securities, also register securities issued in the other CSDs.

Chart 2 shows how cross-border settlement between two participants in separate national CSDs may take place via a Nordic CCP.

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<sup>27</sup> The European Code of Conduct for Clearing and Settlement published by the European Commission in November 2006, acceded to by the European stock exchanges, CSDs and CCPs, including VP and OMX Nordic Exchange. The purpose of the Code of Conduct is to reduce the barriers to the development of a single European securities market.

<sup>28</sup> The Markets in Financial Instruments Directive adopted in 2004 by the Council and the European Parliament.



Note: The Chart shows cross-border settlement via a CCP between the selling participant A in the investor CSD and the buying participant B in the issuer CSD. The CCP holds a securities account in both CSDs. The arrows show the final settlement of the securities step by step.

Source: ECSDA Working Group 3 (2006).

As Chart 2 illustrates, the cross-border sale from A to B is divided into two national DvP trades. The CCP enters into both local trades as a party on normal terms. After the execution of the first trade, in which the CCP receives securities from A in a DvP settlement, the securities are transferred FOP from the CCP's account in the investor CSD to its account in the issuer CSD. Technically, this is done by transferring the securities in the issuer CSD from the securities account of the investor CSD to the CCP's securities account. Then the securities can be transferred to B in a normal DvP transaction in the issuer CSD.

In practice, the functionality of such cross-border settlement will far from measure up to local settlement. It will, for example, be difficult to settle back-to-back trades, in which purchased securities are resold immediately. Since the settlement currencies are different, the establishment of such a model for cross-border settlement will require further development of the various CSDs' currency-settlement facilities. Market participants without access to the markets in question may, however, request such options.

A Nordic CCP does not necessarily have to offer cross-border settlement, of course; it could be established solely with a view to netting and economies of scale.

### **5.3. Existing settlement risks in the Danish market**

As section 2 outlines, electronic settlement of securities reduces the settlement risk stemming from the participants' counterparty risk. This also applies to VP, cf. section 5.1, which shows that the principal risk is eliminated via DvP, and that the remaining risks, including the replacement risk, are limited because the main part of the settlement, which is brought forward to before the value date, take place already on T+2.

In connection with CCP settlement, the replacement risk is of special interest as it can almost be eliminated via the establishment of a CCP. Danmarks Nationalbank and VP have jointly analysed<sup>29</sup> the significance of the replacement risk for trades reported to VP. In the analysis, the seller's possible loss is assessed in the event that all trades with a participant that fails must be cancelled, while participants who thereby lost a gain are disregarded.

The analysis was based on a number of extreme assumptions. The data related to a day when turnover in VP was more than three times the normal turnover. The assumed drop in market prices corresponded to the largest fall over a three-day period since 1990, i.e. a 13.1 per cent fall in share prices and a 4.9 per cent fall in bond prices measured by the benchmark 30-year mortgage-credit bond. Finally, the participant that failed was assumed to be the largest participant.

Even in this extreme scenario, the participants suffered only modest losses. The bank that suffered the largest loss as a result of the replacement risk lost only approximately 8 per cent of its capital buffer, i.e. the excess capital in relation to the minimum requirement. The other banks suffered much smaller losses. The replacement risk in the Danish market is thus estimated not to be a threat to the participants' solvency or to the financial system.

### **5.4. Assessment of the basis for CCP clearing in the Danish market**

When assessing the benefit of establishing a CCP in relation to the costs involved, many criteria must be taken into account, cf. the review in section 3. The most important benefit is that the risk is limited, partly by the CCP becoming the counterparty, partly via netting. Both may reduce the participants' capital requirements.

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<sup>29</sup> Danmarks Nationalbank, Financial stability 2005.

Netting may also offer efficiency gains by way of liquidity savings and a reduction of the number of trades to be settled. Moreover, CCP clearing entails that the pre-trade anonymity introduced in electronic trading systems is preserved during settlement. These benefits must be weighed against the costs of establishing a CCP complying with the international standards, cf. the review in section 3.2.

#### **5.4.1. Limitation of credit risk**

##### **5.4.1.1. Reduction of credit risk via bilateral netting**

The aggregate replacement risk in the Danish market is limited, cf. the analysis in section 5.3, which showed that even in a worst case scenario the most severely affected participants would lose no more than 8 per cent of their capital buffer in relation to the minimum requirement. The analysis does not take into account that the participants' losses are often smaller as a result of bilateral netting. In this way, they can limit their losses because other trades with the participant that fails are not settled, but can be set off. In the analysis, the losses occur because the participant that fails does not buy securities that have depreciated. Thus a claim will arise against the participant's estate corresponding to the total loss that results from the non-settlement. A participant can set off such claims against any claims which the estate might have against it, e.g. from similar purchases of securities that have depreciated or from other trades.

This will especially apply to the Danish participants since their counterparty risk from the securities trade is included in their overall position management, where their various trades are bilaterally netted, as described in section 3.1.2. In the event that a party fails, this net statement will be closed out and the insolvent estate be forced to accept netting by close out. This is regulated by law in the Securities Trading Act. Furthermore, in previous discussions about ensuring securities settlement, the Danish participants have indicated that they prefer to calculate their counterparty risk bilaterally for each participant and not transfer part thereof to a special kind of protection scheme.

The bilateral position management does not, however, change the fact that a CCP would practically eliminate the replacement risk, not only limit and control it. For trades concluded in the trading systems, the participants have limited control options, as they are only informed about the identity of their counterparty after the conclusion of a trade. This especially applies in connection with share

settlement, which to a higher degree takes place in a trading system, and because shares are more volatile than bonds.

The foreign participants, who have only few trades with the participants in the Danish market, do not have the same possibility of protecting themselves by bilateral netting. For the same reason, the demand for CCP clearing is normally greater from foreign participants than from local participants.

#### **5.4.1.2. Delayed reporting of share trades**

As described in section 5.1.2.3, foreign participants are often rather late in reporting the trades that are not automatically sent to VP from the trading platforms. Such late reporting will reduce the effect of a CCP since the CCP will not be able to enter into the trades until they are reported to it by way of netting by novation, cf. section 3.1.2.

As mentioned earlier, the foreign participants in OMX Copenhagen's share market constitute almost half of the total number of participants. The share turnover on the stock exchange amounts to just under kr. 4.2 billion, while share settlement in VP's morning blocks amounts to kr. 2.2 billion. A considerable part thereof is assumed to stem from cross-border participation and to be reported to VP immediately prior to settlement.

How much the effect is reduced depends on the time of reporting in relation to the time when the trade is concluded and the final settlement. If the CCP does not receive confirmation until the day after the trade, the period in which the risk is eliminated will be almost halved. If confirmation is not received until the value date, cf. the review in section 5.1.2, the limitation of risk will be negligible. The reason why the effect is halved if reporting takes place the day after the trade day is that, from a risk perspective, settlement normally takes place two days after the trade day, although VP officially settles on T+3. This is because final settlement is generally effected on the evening before the value date.

To optimise the effect, the CCP should enter into share trades shortly after their conclusion or in connection with their conclusion via an open offer system. In that case, the foreign participants must change their practice, which may give rise to problems in respect of the management of their securities portfolios in the omnibus accounts that they frequently use. Omnibus accounts hold securities belonging to several customers. Prior to reporting to VP, the participants must thus make sure that a customer who has sold securities has cover for

his sale. If not, the participants may have to use other customers' portfolios to meet obligations that are irrelevant to them.

This problem could be solved by separating reporting to a CCP from reporting to VP when the trade is ready for settlement. VP's settlement system already supports such separation of reporting, as it is divided into preadvices and instructs. A trade is only ready for settlement when the parties have submitted both a preadvice and an instruct, which may, however, be submitted together.

Should such separation of reporting be introduced, the situation must be taken into consideration where the CCP has entered into a trade in which its counterparty has not sent final settlement instructions to VP, e.g. by way of delivery of securities. If the CCP's counterparty does not instruct by the value date at the latest, the securities will not be delivered on time to the CCP. Consequently, the CCP will land in a situation where it does not deliver on time to the buyer, which is hardly satisfactory, should it happen often. This could make the introduction of a central lending facility in VP topical.

#### **5.4.1.3. The bond and repo markets**

In bond trading, the participants generally know their counterparties, as the daily turnover involving an anonymous counterparty in MTSDenmark only amounts to approximately kr. 1.4 billion, and the risks are limited. This does not necessarily apply to the repo market, given its size and the longer maturities for repos. This results in relatively larger settlement risk for the repo market in relation to the other submarkets. This risk has not been fully identified in the above-mentioned analysis. However, daily margin adjustment of the repos is becoming increasingly prevalent, so that the underlying securities currently indicate the price on the stock exchange, cf. section 5.1.1.

#### **5.4.2. Limitation of liquidity risk**

The introduction of a CCP in the Danish market may limit the liquidity risk, as described in Box 1.

VP settlement rates are on a par with the European benchmark, i.e. 97-98 per cent for share settlement and 99-100 per cent for bond settlement. If trades are not settled on the value date, the reason is usually that the seller does not have the securities. The introduction of a CCP committed to delivering securities on time could improve the settlement percentage and thus reduce the liquidity risk.

Many CCPs, however, only have an obligation to pay on time but not to undertake timely delivery of securities on the value date.<sup>30</sup> With a view to fulfilling a delivery guarantee, CCPs that undertake such a guarantee, cf. section 2.3, usually require compulsory membership of a securities lending facility, as described in Box 3. Improvement of the implementation rates thus seems to be linked to the establishment of a lending facility rather than the establishment of a CCP and is consequently not in itself an argument for a CCP.

#### **5.4.3. Anonymity**

Should CCP clearing be introduced in the Danish market, the participants' counterparty will be the CCP and not a participant that is unknown at the time of trading on OMX Copenhagen's and MTS's systems.

The market participants' present lack of opportunities to control their counterparty risks when trading on the trading platforms will thus be resolved with the introduction of a CCP. The related problems are, however, insignificant due to the limited turnover in the trading systems, cf. section 5.1.1. Similarly, the above-mentioned review of the credit risk must be taken into consideration, which shows that even in extreme situations the most severely affected participants will not suffer losses that will pose a threat to their solvency.

The introduction of a CCP might also address the problem that the pre-trade anonymity on the trading platforms is subsequently broken in connection with settlement. The market participants should include this aspect in their current evaluation of the need for the introduction of a CCP, cf. section 3.1.3.

#### **5.4.4. Netting**

The netting that takes place in a CCP normally has positive effects on both efficiency and risks, cf. section 3.1.2.

The netting effect sets in at the time when a CCP enters into a trade. If this takes place immediately after the conclusion of the trade, the participants' counterparty risk will be reduced during the entire settlement period as a result of the netting of their positions. This may be an advantage in terms of the participants' capital requirement, which will be similarly reduced because the counterparty is the CCP, cf. section 3.3. There is no capital requirement for counterparty risk in connection with spot trading.

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<sup>30</sup> Ripatti (2004).

As regards payment netting at the time of settlement, the establishment of a CCP does not seem to offer any liquidity benefits. This is due to the efficiency of VP's multilateral netting system, in which both the cash leg and the securities leg are netted, as well as the participants' flexible possibility of pledging collateral for VP settlement via automatic collateralisation, cf. Box 6.

Yet another efficiency gain from the establishment of a CCP is that it will usually reduce the number of trades for settlement in the CSD. In the Danish market, this would not be possible in those cases where an end-investor is involved in the trading. As mentioned in section 5.1.2, VP must be informed about such investors. Consequently, the number of such trades for settlement in VP becomes higher, not lower, if they are cleared in a CCP. The reason is that the CCP, after having entered into a trade between two parties, must report both the resulting trades (the purchase and the sale) to VP in order to enable the buyer to include the necessary information about the end-investor.

The double reporting of the trades concerned may also be one of the reasons why CCP clearing is not used in markets where the CSD registers investors individually, cf. the beginning of section 5 and the review of CCPs in the EU in section 4.

Double reporting must similarly be performed in respect of trades concluded via the DvP link between Euroclear Bank and VP, as described in section 5.1.2. Otherwise, it will be practically impossible to keep track of the involved participants' securities portfolios. It should be noted that VP's settlement day is almost entirely planned with a view to ensuring the efficiency of this link. The link is, however, to a certain extent used in such a way that participants who have accounts in both VP and Euroclear transfer their securities between their own accounts and settle their trades internally in both CSDs.

In the repo market, the longer maturities make netting more favourable. CCP clearing may also have efficiency effects. For trades with current margin adjustment, it may be an advantage for the participants to leave the administration to a CCP. For other trades, where there is no current margin adjustment, CCP clearing may reduce the risks and result in cost savings in respect of the capital requirement.

#### **5.4.5. Costs**

It will undoubtedly require large resources to establish a CCP complying with the international standards described in section 3.2. Besides, it will be necessary to find solutions to the previously mentioned problems of late foreign reporting, registration at individual investor level and the link between Euroclear Bank and VP. The market participants will also incur adjustment costs as a result of changes in their settlement procedures. Moreover, the participants will incur current opportunity costs for pledging collateral to the CCP or other measures to limit its potential risk if a participant fails, cf. section 3.2.3.

Other costs and benefits will of course depend on the CCP model introduced, cf. the description of the various options in section 5.2. As mentioned in this section, the establishment costs could to some degree be avoided if an existing foreign CCP extended its operations to the Danish market.

##### **5.4.5.1. The bond market**

In the bond market, including MTSDenmark, an enterprise such as LCH.Clearnet Limited could, as mentioned, cover the Danish market in the same way as they already cover many other European markets, cf. section 4.3.2. In that case, there will be no direct costs for establishing a CCP. However, this does not mean that e.g. LCH.Clearnet Limited will not incur appreciable establishment costs. They would have to join the Danish market and infrastructure, including offering settlement in Danish kroner.

For the large international participants, including the Danish participants, who may already be connected to LCH.Clearnet Limited, it will of course be an advantage if the latter managed any CCP clearing in the Danish market. This will presumably not be the case for the other Danish participants in the market as a result of the connection costs.

It is usually optional for the participants whether or not they want to clear their bond trading via the CCP, cf. section 4.3.2. As stated in section 5.1.1, turnover on MTSDenmark is limited, and so is the number of daily trades. It is therefore not likely that a Danish regional bank will become a participant in LCH.Clearnet Limited to clear a small single-digit number of daily trades on MTSDenmark.

It also seems unlikely that a CCP such as LCH.Clearnet Limited would be interested in the Danish market, unless it, apart from

MTSDenmark, also includes the OTC market. A solution whereby an existing CCP would be interested in the Danish market thus seems to imply considerable support for CCP clearing from the Danish participants, which has not been there until now.

#### **5.4.5.2. The share market**

This also applies to some extent to the share market. As stated in section 4.2.1, the Stockholm Stock Exchange has already investigated whether the existing CCP, OMX Derivatives Markets, could extend its business area to the Swedish spot market for shares. Although the share turnover in Stockholm is considerably higher than in Copenhagen, it was concluded that there was no business case for a CCP. In 2006, daily share turnover at the Stockholm Stock Exchange amounted to kr. 17.7 billion, more than four times the turnover at OMX Copenhagen.

#### **5.4.5.3. Interest among market participants**

It is difficult to estimate the costs, both the direct costs of establishing a CCP and the derived adjustment costs for the participants. These may run into double-digit or triple-digit millions. To begin with, it seems more relevant to look into the market participants' overall interest in the establishment of a CCP, rather than the exact expenditure, since CCP clearing is usually voluntary in bond-dominated markets such as the Danish market.

The same applies in respect of the participation interest of the foreign participants, who are usually assumed to request CCP clearing. It should not, however, be taken for granted that the foreign participants are always prepared to defray the costs for connection to a national CCP in the Danish market.

#### **5.4.5.4. A Nordic CCP and the repo market**

One way of increasing the interest of both foreign and national participants could be to establish a Nordic CCP, cf. section 5.2.2. This would allow all the participants to reach more markets via one connection. For the large participants, the netting effect would furthermore be increased via the cross-border activity, as described in section 3.1.2. The smaller participants would gain an opportunity to settle cross-border trades, cf. Chart 2 in section 5.2.2.

The establishment of a Nordic CCP will naturally bring economies of scale, both in the establishment phase and in respect of the current costs.

Against this background, the four Nordic CSDs in Denmark, Finland, Norway and Sweden at the end of 2001 offered the market participants to establish a Nordic CCP. Through negotiations at the beginning of 2002, the participants indicated that the benefits did not seem to justify the costs.

The situation may, of course, have changed since then, and the question should be assessed on an ongoing basis, cf. the current recommendations for CSDs. One submarket that has not been assessed separately is the repo market, which is the largest submarket. Here there may be special benefits, as the participants incur a greater risk due to the longer maturities or the administration of daily margin adjustment in relation to the various counterparties. This increases the benefits of netting, which will reduce both the risks and the margin requirements. The latter may also be netted since the margin must be provided to the same counterparty.

## **6. Conclusion**

Under the current recommendations for securities settlement systems, the pros and cons of establishing a CCP in a given market must be assessed. This paper invites participants in the Danish infrastructure to engage in renewed discussions about the potential for introducing a CCP in the Danish market and touches upon the establishment of a CCP for cross-border settlement, but provides no in-depth analysis of the latter. The most recent survey of the Danish market was conducted at the turn of the year 2001-02 when the Nordic CSDs offered to establish a Nordic CCP, cf. section 5.4.5.4. At that time, the market participants did not find that the benefits justified the related costs.

Today CCP clearing is offered on all major stock-exchange markets in the EU, except for the Spanish exchanges and the Nordic OMX market. For the EU bond trading that takes place on electronic trading platforms, participants are, as a main rule, also able to clear via a CCP. CCP clearing was made possible in connection with the introduction of anonymity in trading so that participants cannot identify their counterparties prior to concluding the trade.

Similarly, anonymity applies to share trades concluded in the OMX Copenhagen trading system and to trade in government bonds on MTSDenmark prior to conclusion of the trade. Out of a total daily turnover in excess of kr. 120 billion, share trading via the trading systems accounts for only just over kr. 4 billion and bond trading for approximately kr. 1.4 billion.

The largest volume of trading in Denmark takes place in the bond and repo markets. Consequently, the aggregate settlement risk in the Danish market is assessed to be limited. It has recently been estimated that even under extreme circumstances counterparty risk cannot jeopardise the solvency of market participants or the financial system as such. However, the analysis did not separately address the repo market, in which the longer maturities in relation to the short settlement period in the spot market may entail relatively greater risk.

The benefits of establishing a CCP are primarily related to limiting settlement risk, cf. the review of CCP functionality in section 3. Via netting, a CCP can reduce the aggregate settlement risk in the relevant market segment(s), and by entering into the participants' trades it can assume the counterparty risk for all participants.

A CCP may streamline operations in that, also via netting, it reduces the number of trades for settlement in the CSD covering the market. Finally, a CCP can preserve the pre-trade anonymity that is customary on trading platforms, since participants will not subsequently obtain knowledge about their counterparties in connection with settlement.

When assessing the expediency of establishing a CCP in a market, the benefits must be closely analysed and viewed in relation to the establishment costs. For the Danish market, these are assessed to be substantial due to the requirements imposed on CCPs, i.e. they must be able to meet the concentrated settlement risk assumed. Moreover, participants will have to defray the costs for connecting to a CCP, including adaptation costs for their own internal systems and opportunity costs for ongoing pledging of collateral or other forms of security vis-à-vis the CCP.

The efficiency gains from establishing a CCP in the Danish market are estimated to be limited. This is due to the efficiency of VP's netting system, in which both the cash leg and the securities leg are netted, as well as the participants' option to pledge collateral via the automatic collateralisation arrangement that is an integral part of the VP system, cf. Box 6. This does not, however, apply to the repo market with its longer maturities and potential need for daily margin adjustments. In this market, a CCP could reduce the participants' positions on an ongoing basis and manage margin adjustments by receiving collateral from participants.

Since VP operates with registration at individual investor level, the effect of netting via a CCP in terms of reducing the number of trades for settlement in VP is also limited. The reason is that in connection with the settlement of trades involving an end-investor, information about the individual investors must be submitted to VP. For such trades, a CCP would thus have to report both sides of its trades to VP. The number of trades for settlement in VP would therefore increase rather than fall if comprised by CCP clearing. The same may apply to trades for settlement via Euroclear Bank's link to VP, in order to keep track of participants' portfolios.

Risk concerns and efficiency-gain considerations do not seem to point unequivocally to the establishment of a CCP. Improved anonymity in the market would increase efficiency. The electronic share and bond markets are, however, limited in size. It might be worth investigating whether an existing foreign CCP could extend its

operations to cover one or both of these submarkets. However, it would be necessary for this CCP to set up in the Danish market and offer settlement in Danish kroner.

In addition, the establishment of a CCP in the share market will require a solution in relation to foreign participants, which are assumed to send a considerable volume of their settlement instructions to VP on the value date, immediately prior to settlement, cf. section 5.4.1.2. As such it does not seem efficient to exclude such participants from any CCP clearing set up, but their participation could emphasise the need to introduce a lending facility in VP. This might be the case if late reporting to VP means that the CCP is frequently unable to meet its obligations. Finally, the Stockholm Stock Exchange did not find grounds for offering CCP clearing in the Swedish share market, which is more than four times as large as the Danish market.

Bond turnover on MTSDenmark entails a further problem in relation to management of clearing by an existing CCP in that most of the Danish participants are not currently participants and are hardly likely to be willing to defray the connection costs in order to clear a small number of trades per day.

As for achieving a sufficient volume in Danish CCP clearing, it does not immediately seem expedient to split up the market into subsegments. If we therefore turn to the aggregate market, the overall analysis applies, in which case the criteria concerning risk hedging, efficiency and anonymity do not point decisively to the establishment of a CCP in the Danish market. A submarket that has not been separately analysed is the repo market, which had daily turnover of approximately kr. 61 billion in 2004 according to OMX Copenhagen. Here, netting via a CCP could reduce the long-term positions, and pledging of collateral to the CCP might replace individual margin adjustment, which could boost efficiency.

Determining whether there is a basis for establishing a CCP in the repo market would require an in-depth analysis of the pros and cons, applying the criteria outlined in this working paper. This means procuring information about the aggregate outstanding volumes in the market and the derived risks. It should be clarified whether any of the specific problems identified in other contexts would also apply to the repo market. Market participants must be identified with a view to assessing the proportion of the market that stems from the wholesale market, which would be eligible for clearing via a CCP, and the

percentage that relates to e.g. transactions between banks and their customers. Interest among participants must be estimated since it would hardly be realistic to make the use of a CCP compulsory in view of the fact that the repo market is an OTC market. Naturally, this assumes that a trading platform for the repo market is not established at the same time, and that e.g. MTSDenmark does not extend its operations to this area.

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## **8. Appendix 1**

### **OMX Nordic Exchange Copenhagen's comments on the working paper concerning the introduction of a CCP in Denmark**

We have read Danmarks Nationalbank's working paper "Analysis of the pros and cons of introducing a central counterparty in the Danish securities market" with interest and are pleased to note that Danmarks Nationalbank wants to initiate a renewed debate on the benefits of a CCP solution in the Nordic markets. We look forward to engaging in a dialogue with Danmarks Nationalbank and other stakeholders in the market about this core issue, which concerns the future development of the Danish securities market.

The working paper concludes that the repo market is likely to achieve efficiency gains from a CCP solution. We fully share this view, and we also support the initiative by Danmarks Nationalbank to prepare an independent analysis of a CCP solution for the repo market. However, in our opinion the working paper regrettably leaves out a number of major considerations when it concludes that there is currently no need to introduce a CCP solution for the rest of the securities market.

OMX Nordic Exchange stance on the need for a CCP solution is e.g. based on a report by Sveriges Riksbank. In this report, the Stockholm Stock Exchange in 2003 concluded that there was no business case for establishing a CCP in the Swedish share market. The Nordic markets have developed considerably since then, and consequently reference to this report is of very little relevance.

OMX has established The Nordic Exchange on the basis of seven independent Nordic and Baltic exchanges. Our new Nordic set-up has increased non-Nordic investors' interest in trading our products, and cross-border trade within the Nordic region has increased substantially. In Copenhagen, non-resident market participants account for 40 per cent of the stock-exchange turnover. The advantages of a larger and more international investor basis are evident: a liquid market, sharp prices, more business, and more jobs within the sector.

The preconditions for retaining foreign market participants, particularly after the MiFID's entry into force on 1 November 2007,

should be a key element in the conclusion to the paper. This issue is not elucidated in the overall analysis.

The introduction of the MiFID will bring considerable structural changes in the European financial markets, which means that competition will intensify further. The MiFID eliminates the current status of the exchanges and opens up for alternative marketplaces such as MTFs. Consequently, it is no longer certain that stock-exchange members will obtain the best prices in the local marketplaces where the companies are listed. In the worst case, the "best execution" requirement could mean that trading in the 5-10 most liquid Danish shares moves to other marketplaces. If trading moves, so will liquidity.

It is of paramount importance to a small market that even in a post-MiFID regime it aims to be as effective and competitive as the surrounding markets. Without a CCP, Denmark and the other Nordic markets will still have a less effective market solution, and several current and potential members are already requesting a Nordic CCP solution for several reasons:

Today CCP is a market standard applied by the majority of our competitors, and, as the working paper states, most of the European share markets see a number of benefits from using a CCP. We would therefore like the analysis to be extended to include the background for this, and which of these benefits would also apply to our market.

In addition to minimising the counterparty risk and simplifying risk management, a CCP ensures the anonymity of the counterparty and reduces the settlement volume per trade due to netting. Netting also makes a market attractive for "algorithmic trading", an increasingly predominant trading pattern.

The CCP's risk management function also allows foreign brokers, with less financial clout, to conclude trades and operate in markets where it would not otherwise be possible.

For all market stakeholders it is extremely important that the Danish securities trading market remains competitive in order to retain the interest of national and international investors. How a CCP solution can contribute to making the Danish securities market more attractive is an interesting point of departure for further debate, and we look forward to participating in these discussions. We are also willing to

arrange a meeting with Danmarks Nationalbank in order to elaborate on the arguments presented in this letter.

Signed by

Jan Ovesen, President  
OMX Nordic Exchange Copenhagen

## **9. Appendix 2**

### **BIS Recommendations for Central Counterparties**

Report on the CPSS-IOSCO Joint Task Force on Securities Settlement Systems, November 2004

1. A CCP should have a well founded, transparent and enforceable legal framework for each aspect of its activities in all relevant jurisdictions.
2. A CCP should require participants to have sufficient financial resources and robust operational capacity to meet obligations arising from participation in the CCP. A CCP should have procedures in place to monitor that participation requirements are met on an ongoing basis. A CCP's participation requirements should be objective, publicly disclosed, and permit fair and open access.
3. A CCP should measure its credit exposures to its participants at least once a day. Through margin requirements, other risk control mechanisms or a combination of both, a CCP should limit its exposures to potential losses from defaults by its participants in normal market conditions so that the operations of the CCP would not be disrupted and non-defaulting participants would not be exposed to losses that they cannot anticipate or control.
4. If a CCP relies on margin requirements to limit its credit exposures to participants, those requirements should be sufficient to cover potential exposures in normal market conditions. The models and parameters used in setting margin requirements should be risk-based and reviewed regularly.
5. A CCP should maintain sufficient financial resources to withstand, at a minimum, a default by the participant to which it has the largest exposure in extreme but plausible market conditions.
6. A CCP's default procedures should be clearly stated, and they should ensure that the CCP can take timely action to contain losses and liquidity pressures and to continue meeting its obligations. Key aspects of the default procedures should be publicly available.
7. A CCP should hold assets in a manner whereby risk of loss or of delay in its access to them is minimised. Assets invested by a CCP should be held in instruments with minimal credit, market and liquidity risks.

8. A CCP should identify sources of operational risk and minimise them through the development of appropriate systems, controls and procedures. Systems should be reliable and secure, and have adequate, scalable capacity. Business continuity plans should allow for timely recovery of operations and fulfilment of a CCP's obligations.
9. A CCP should employ money settlement arrangements that eliminate or strictly limit its settlement bank risks, that is, its credit and liquidity risks from the use of banks to effect money settlements with its participants. Funds transfers to a CCP should be final when effected.
10. A CCP should clearly state its obligations with respect to physical deliveries. The risks from these obligations should be identified and managed.
11. CCPs that establish links either cross-border or domestically to clear trades should evaluate the potential sources of risks that can arise, and ensure that the risks are managed prudently on an ongoing basis. There should be a framework for cooperation and coordination between the relevant regulators and overseers.
12. While maintaining safe and secure operations, CCPs should be cost-effective in meeting the requirements of participants.
13. Governance arrangements for a CCP should be clear and transparent to fulfil public interest requirements and to support the objectives of owners and participants. In particular, they should promote the effectiveness of a CCP's risk management procedures.
14. A CCP should provide market participants with sufficient information for them to identify and evaluate accurately the risks and costs associated with using its services.
15. A CCP should be subject to transparent and effective regulation and oversight. In both a domestic and an international context, central banks and securities regulators should cooperate with each other and with other relevant authorities.