



Central counterparty clearing for the securities market

Central counterparties (CCPs) have long been active in the clearing of derivative transactions, but they are a new element in the clearing of other securities. Interest in central counterparty clearing for the securities market has increased in recent years, both in Sweden and the rest of Europe. The advantages and disadvantages of this type of system are currently being discussed by both market participants and public authorities.

Central counterparties take care of the actual clearing process between trading and settlement of securities transactions. Each transaction is replaced by two new contracts, where the central counterparty is seller to all buyers and buyer to all sellers. As a result, the original parties have a claim or a debt against the clearing house instead of each other. Clearing is carried out on a multilateral net basis²⁴ and the settlement risks the parties would have had against one another are redistributed to the central counterparty. If one party in a securities transaction defaults, two types of counterparty risk arise: full credit risk and replacement cost risk²⁵. In Sweden, as in most of the large securities markets, the principle of “Delivery versus Payment” (DVP)²⁶ is applied in settlement. This means that full credit risk disappears from securities settlement. The remaining counterparty risk for the central counterparty to manage is the replacement cost risk.²⁷

A central counterparty does not only redistribute risks but also reduces them. A central counterparty does not take any positions of its own and therefore does not expose itself to market risk, only to replacement cost risk towards its counterparties. A central counterparty manages this risk by several means. One is to set high membership requirements and require a high credit rating for all members. In addition, there is a requirement for collateral which with a probability of 90–95 per cent will cover the expected future exposures. Moreover, the central counterparty recalculates the value of the exposure at least once a day and demands additional collateral

Choosing a method for settlement for the securities market, implies weighing efficiency against risks. The two most common methods are *gross settlement* and *multilateral net settlement*.

In gross settlement each transaction is settled separately as it occurs. All the securities and the full payment must be transferred for each transaction. This settlement method results in low settlement risks but requires, on the other hand, more liquidity.

In multilateral net settlement all parties' claims are cleared against one another on a net basis. Hence, this method reduces the need for liquidity but results in higher risks, since the whole settlement process will be halted should one single party – irrespective of its size – default on its payments.

24 There are some central counterparties that do not net transactions, merely taking on counterparty risks.

25 Full credit risk refers to a situation where a counterparty risks losing the entire underlying value in a deal. The replacement cost risk reflects the risk that arises if a party in a transaction defaults or for some other reason fails to meet its commitments before the transaction is settled. In this case the non-defaulting party may be forced to enter into a replacement deal to secure the necessary security or money. If the market value has changed so that the replacement deal is more expensive than the original one, the non-defaulting party has made a loss.

26 DVP is applied when delivery of securities takes place at the same time as payment is made.

27 See Financial Market Report 1998:2 for a detailed discussion.



if necessary. On top of this, a central counterparty has its own financial assets to absorb any losses. These assets can take the form of equity capital, settlement guarantee funds or insurance policies.

Traditionally, central counterparties have only been found in the derivatives market, as the need for efficient risk reduction is particularly evident in this market. Replacement cost risks are much larger and more difficult to manage in the derivatives market than in the spot market, as the risk exposure extends over a longer period of time. Spot transactions are usually settled within three days after a deal is concluded. Thus, the derivative transactions give rise to longer exposures and thereby greater replacement cost risks and require good risk management. The repo market comes somewhere in between these two, with durations that are shorter than on the derivatives market but longer than on the spot market²⁸. The advantages of a central counterparty increase if the same counterparty can be used for the spot, repo and derivatives markets, while the marginal cost of adding new instruments in an existing central counterparty system would probably be low.

Offering clearing of spot instruments in addition to derivatives entails a modest risk increase for the central counterparty, while the efficiency gains can be considerable. For one thing, as is the case in all clearing and settlement operations, central counterparty clearing has economies of scale that make it more efficient to utilise one and the same system for the various markets. Large fixed investment costs and relatively low variable costs mean that the transaction cost that arises on the margin is reduced in relation to the size of the system, thereby reducing the average cost. Secondly, if a central counterparty manages both the spot and derivative markets, it can take advantage of the participants having offsetting positions on the two markets. In this way, counterparty exposures can be reduced and the central counterparty can have less capital than would have been required for two separate central counterparties.

The effects of a central counterparty on securities settlement

Central counterparty clearing can contribute to both more efficient and more secure securities settlement. This is mainly achieved by *multilateral netting* and *redistribution of counterparty risk*.

Efficiency gains arise primarily through smaller settlement flows, better utilisation of economies of scale and increased liquidity. The advantages on the risk side stem from fewer and more predictable exposures and simpler risk management.

MULTILATERAL NETTING

In securities trading the same security is often sold back and forth between market participants. As a result of these transactions, a

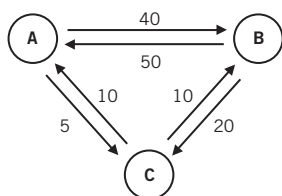
²⁸ According to a survey by the Riksbank in 1998, most of the contracts had a duration of between one and seven days.



number of exposures can arise that offset one another completely or partially. When the securities transactions are cleared or settled on a net basis the participants can simply offset transactions against one another, which is illustrated in the Figure below.²⁹

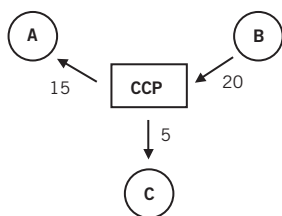
Multilateral netting with a central counterparty (CCP)

The exchange of payments arising from securities transactions without a CCP:



	A	B	C	To pay
A		40	5	45
B	50		20	70
C	10	10		20
To receive	60	50	25	135

The exchange of payments arising from securities transactions with a CCP:



	CCP
A	15
B	-20
C	5

Note. The same reduction in the number and value of payments can be offered by a clearing house which provides multilateral net does not act as a central counterparty. For example VPC does this.

The Figure above illustrates the difference between gross settlement and multilateral net settlement through a central counterparty in both turnover and number of settlements. If the transactions are cleared and settled gross, as in the upper part of the figure, the participants have to manage a total of six transactions. The turnover amounts to 135. If the transactions are instead cleared or settled on a multilateral net basis, the number of settlement transactions is reduced by half, which also reduces the exchange of payments between the participants. The participants' net positions towards the central counterparty constitute the difference between what each would have paid in total and what they would have received from the others in gross settlement. The Figure above shows this as the difference per participant between the final column and final row in the table. The turnover is then reduced to 40. The positive netting effect is greater the more the participants trade with one another, i.e. the larger and more numerous the exposures are between the participants.

The reduction in both the number of transactions and the turnover leads to lower total settlement costs. The direct costs that cover

²⁹ Only the payment leg of the security transaction is discussed here. The securities leg of the transaction can be netted if the exact same security is involved in the transaction. Because this is often not the case, the netting effect is smaller for the securities leg. It is more interesting for fixed income transactions than stocks because it is more often the same security that is being bought and sold.



both charges to the settlement system and internal handling costs, known as operational costs, fall. In addition, the lower value of payments means that the participants' costs for liquidity are reduced. This effect is particularly valuable if liquidity becomes scarce as a result of disturbances or shorter settlement cycles.

Risk reduction as a result of multilateral netting can also affect trade volumes positively. As a result of established practice, or in some cases regulations, market participants often limit their trading volumes to a certain percentage of their balance sheet. In these cases the netting effect increases the participants' scope for action. However, with regard to securities trading this practice is unusual as the replacement cost risk is not one that participants limit to any significant extent. The effect may have greater significance for the repo market.

Increased trading volumes lead to increased market liquidity and to better utilisation of economies of scale, which lead in turn to further savings in terms of settlement costs. Liquidity affects the participants' capacity to rapidly sell or buy securities. Increased market liquidity, combined with better utilisation of economies of scale may in turn attract new investors to the market and further increase trade volumes.

Without well-developed risk management mechanisms, multilateral netting can entail large risks. In a multilateral netting system without sufficient risk management to guarantee settlement, the default of even one participant with very small transaction values can stop the entire settlement process. In order to realise the advantages of a netting system, the market must have access to an institution offering secure multilateral net settlement. This is where the central counterparty has a role to play.

In addition to netting the transactions, a central counterparty can also net the marginal collateral the participants are obliged to offer to cover their exposures to replacement cost risk. If there is extensive trade in instruments with identical or highly correlated risks, the netting helps to lower participants' costs for capital adequacy requirements, given that the financial supervisory authorities are willing to accept this.

REDISTRIBUTION OF COUNTERPARTY RISK

Central counterparty clearing also entails an important redistribution of the counterparty risk from the participants to the central counterparty. Market participants exchange risks against individual counterparties for one risk against the central counterparty. If there is no central counterparty, the market participants are exposed to a counterparty risk in each transaction, which creates a need to continuously monitor the counterparties' credit positions. This reduction in the number of counterparty exposures leads to a considerable simplification of participants' risk management and reduces the related costs.

The redistribution of counterparty risks does not only lead to efficiency gains, it also has risk-reducing effects. By gathering all counterparty risks to one single counterparty, each participant obtains a diversification of risk that would not be possible for an indi-



vidual to achieve alone. This advantage increases in relation to the number of participants in the market and according to how heterogeneous their risk distribution is. When the counterparties have a homogenous risk profile, the risk-reducing effect provided by credit assessment and monitoring of counterparties is smaller in relative terms. For foreign participants with less knowledge of the local market, the transfer of risk to a central counterparty is always valuable.

The risk redistribution effect is less interesting in the spot market than in the derivatives market as the counterparty risks are not as high there. On the other hand, a failure to deliver can entail substantial administrative costs.³⁰ For this reason, counterparty clearing in spot trading may be more valuable on the stock market, where there is a large number of heterogeneous participants. In the fixed income market, on the other hand, the number of counterparties is smaller and they are often better known to one another.

The positive effects of risk redistribution become more evident when the market is turbulent and risks increase. In volatile markets participants might stop trading. This is exactly what happened among other places in the UK in connection with the stock market fall in 1987. Some of those who cease trading during times of market turbulence would probably have continued if they had a known, secure counterparty to trade with.³¹ A central counterparty can thus contribute to more stable market liquidity.

The transfer of counterparty risk to a central counterparty also provides better conditions for anonymous trading, as an individual participant's trading does not need to be known to the others. Anonymous trading has a positive effect on the large participants incentive to trade in particular, as they do not need to worry about the effect of their own trading on market prices. Trade with a single counterparty that stands for a known and predictable risk also facilitates trade for smaller participants and thus gives them an entry into the market. The quality of anonymity thus also has a positive effect on market liquidity.

ASSESSMENT OF THE ADVANTAGES AND DISADVANTAGES

From an efficiency point of view, given that suitable risk management mechanisms are applied, the consequences of central counterparty clearing are consistently positive, at least in the short term. However, there are costs linked to the creation of and participation in central counterparty clearing and these must be weighed against the advantages. There are costs for acquiring capital, charges for participation and costs that arise in connection with necessary adaptations in the participants' systems. However, these do not need to be so large if there is already a properly functioning central counterparty whose services can be utilised. A total picture of the effects

³⁰ The central counterparty can handle a failure to deliver a security by having a contract with an institutional investor which would allow the central counterparty to deliver a security from the investor's portfolio.

³¹ This is illustrated, for instance, by the market turbulence in autumn 1998. Derivative markets with a central counterparty were relatively unaffected, while many other derivative markets in principle ceased to function.



EFFECTS OF CCP CLEARING ON THE SECURITIES MARKET

	Multilateral netting	Risk redistribution
Efficiency	<ul style="list-style-type: none"> ■ fewer settlements ■ economies of scale ■ liquidity 	<ul style="list-style-type: none"> ■ simpler risk management ■ anonymity
Risks	<ul style="list-style-type: none"> ■ fewer exposures ■ lower operational risks 	<ul style="list-style-type: none"> ■ predictable exposures ■ diversification

of central counterparty clearing in the securities market is shown in the Figure above.

The efficiency gains that can be made through the introduction of a central counterparty arise largely as a result of better utilisation of economies of scale and increased liquidity. This means that these gains increase in relation to the size of the market, both with regard to the number of participants and trade volumes. In addition, the effects on liquidity can be substantial, especially if the size of the counterparty exposures is actually a limiting factor for trade, although this need not always be the case. On the other hand, good settlement systems in themselves can be a condition for ensuring that new participants, particularly foreign participants, become interested in trading on a certain market. New participants can improve liquidity. Centralisation and a lack of competition, on the other hand, if a central counterparty is established, may lead to long-term efficiency problems. For instance, they can lead to poorer incentives for keeping costs down and may hamper the rate of innovation.

From a risk perspective, the effects of a central counterparty are not only positive. Although central counterparty clearing brings about a significant reduction in risk for the participants, this must be weighed against the concentration of risks into one central counterparty. When there is already a central counterparty managing the more risky derivative transactions, the further concentration that would arise from also including the spot market is limited.

Central banks and central counterparties

The main reason why central banks are interested in securities settlement from a payment system perspective is that problems with this type of settlement can spread through the financial system and cause serious disturbances. This is due to the value of the securities transactions handled daily, to the key role they play as collateral in transactions and to their role in the financial institutions' risk management strategy. In addition, central banks regulate the liquidity in the banking system by providing the banks with loans against collateral. Properly-functioning securities settlement that can manage these flows in a safe and efficient manner is therefore also important for monetary policy.

From a central bank's perspective, the question of central counterparty clearing gives rise to an important trade off. It can provide substantial efficiency gains for market participants and can lead to



more liquid capital markets. However, problems can arise as a result of the large risk concentration entailed in central counterparty clearing. This risk concentration is so extensive that if the central counterparty were to fail, it would lead to the collapse of the entire securities market. The concentration can also lead to “moral hazard” problems if the central counterparty can be considered to be “too big to fail”. If the market expects that the authorities will not allow a central counterparty to fail due to the destabilising effect this would have on the financial sector, it could lead to excessive risk-taking. The requirements regarding risk management and supervision and oversight by public authorities must be dimensioned accordingly. Central banks and supervisory authorities do have experience of handling these issues, as central counterparties have long been active in the derivative market.

Traditionally, central counterparties have been user-owned, but profit-making limited companies are becoming more common in this role. Competing and profit-making central counterparties may have an incentive to lower their costs, for instance, by lowering standards for risk management or for operational security. To counteract this, the central counterparty must have adequate capital that the owners can risk in the event of problems. In addition, the owners’ and the management’s risk exposure can increase in that they contribute their own funds to the settlement guarantee fund. Efficiency aspects, particularly dynamic efficiency, point towards central counterparty systems run by listed companies, which find it easier to finance their operations through share issues. In addition, user-owned companies more often experience conflicts between different categories of owner and user that can result in a slower innovation rate and slower processes for strategic decision-making.

An analysis of the ownership structure becomes even more important if one takes into account the fact that a central counterparty often holds a monopoly position on the market. Limited companies can use their market power to achieve monopoly profits. This problem is not as acute among user-owned companies that often apply the cost plus principle³² in their pricing, which entails lower charges for members. User-owned central counterparties, on the other hand, can utilise their position to favour their members, particularly the large owners at the cost of potential competition from new members.

All forms of ownership have their advantages and disadvantages. From a public authority’s point of perspective, it is important to understand these in order to follow up on problems that can arise from the different forms.

³² Cost plus means the company is guaranteed to cover its production costs plus a further compensation that makes up a profit.



A central counterparty for the Swedish securities market?

In Sweden there is central counterparty clearing for the derivatives market under the auspices of Stockholm Stock Exchange. The introduction of Swedish securities into an existing central counterparty, either within Sweden or abroad would presumably be a less dramatic change than if a central counterparty is built from scratch. Not only would the necessary investments not be as great but also public authorities would have already been forced to manage the risk concentration which a central counterparty entails. The introduction of a central counterparty for securities transactions in Sweden has been investigated by the Swedish Securities Dealers Association, the Stockholm Stock Exchange and VPC. Although the following discussion makes no pretensions to be complete, it may be interesting to review the advantages and disadvantages described in the previous sections once again and see whether they are relevant to Swedish market conditions.

The conditions for a central counterparty in Sweden differ with regard to the stock market and the fixed income market. The stock market is characterised by many market participants, many transactions and relatively low transaction values. The majority of the trading takes place anonymously. In contrast, trade in fixed income securities is characterised by few market participants, relatively few transactions, but high transaction values. This description reflects the current state of the market, but conditions may change over time. For instance, the trade in fixed income securities is currently moving over from telephone trading to the Stockholm Stock Exchange's electronic interest rate market, which is only open to market makers.

Transactions on both markets are settled by VPC. Currently, settlement occurs through a multilateral netting process that lacks risk management. If one participant is unable to meet its commitments, VPC must resort to an "unwinding" routine. This cannot guarantee settlement on the same day and is thus in breach of international requirements for secure net settlement. The Riksbank has long been critical of this and the IMF also pointed out that VPC's net settlement routines were inadequate.³³ During 2003 VPC will launch a new system to remedy this. (see Box).

³³ IMF (2002), Financial System Stability Assessment, IMF Country Report, No.62/161.



COMING CHANGES IN VPC'S SETTLEMENT SYSTEM

VPC is currently implementing changes in its settlement system. These are aimed at building in risk management mechanisms that will minimise contagion risks if a participant fails. The current system settles transactions on a net basis without satisfactory risk management. It is efficient in the sense that it minimises the use of liquidity and the number of payments. However, it contains an unacceptable level of net settlement risk. Net settlement risks mean that if a participant is unable to meet its commitments at the agreed time, the entire settlement process must be broken off and an “unwinding” process must be used. This means that it can take a long time to get the system functioning once again. The new process will manage this risk, but in return it requires greater liquidity and entails a larger number of payments. The new process also entails a change in the relative advantages and disadvantages of a central counterparty.

The new process will check every transaction one by one. The seller's security and the buyer's money will be reserved for settlement, whereby the transaction will be marked as ready for settlement. This checking procedure means that a transaction that has been marked as ready for settlement is also guaranteed to be settled in the next settlement batch. There is no risk that settlement must be broken off as a result of one participant defaulting. VPC's system will thus fulfil internationally accepted minimum requirements.

The new process is designed to manage continuous gross settlement. However this is not what the market wants at present. Instead, the transactions will be checked and liquidity will be reserved on a gross basis, while settlement will take place at a limited number of settlement batches during the day.

The liquidity requirement is therefore considerable and the liquidity is locked into the system from the time the transactions are marked as ready for settlement until they are settled. When it comes to money market settlement, settlement banks will have an opportunity to borrow using purchased securities as collateral to generate liquidity.

To facilitate VPC's checking of liquidity, the Riksbank has begun a new co-operation with VPC. The Riksbank has decided to allow VPC to administer special Riksbank accounts, intended only for securities settlement. Holdings in these accounts will be claims on the central bank



and settlement will thus be in central bank money. This is a well established requirement for sound settlement systems. The Riksbank can also grant intraday credit on these accounts.

If a registered transaction cannot be marked as ready, for settlement it will remain in the queue until the next settlement occasion. If it cannot be marked during the day, it will be removed from the system. The system manages the risks arising during the settlement process, but not the risks arising during the settlement cycle between deal and settlement.



However, when the new system comes into operation, there will remain a need to manage the replacement cost risk that arises between trading and settlement and to increase efficiency in the use of liquidity. Both of these needs can be satisfied by a central counterparty.

The multilateral netting offered by a central counterparty can reduce counterparty exposure, number of transactions and turnover, even in the Swedish market. There is no multilateral netting of counterparty exposures between trading and settlement today. If a central counterparty entered into the transaction directly after the deal was made, the exposures would be netted directly and thereby be less during the entire settlement cycle. In the fixed income market these exposures are relatively large, but many are bilateral and can therefore be netted by the parties themselves. On the stock market the exposures are smaller but there is a large number of counterparties and central netting may thus be more advantageous here.

Today there are no central processes in the Swedish market that manage the replacement cost risk that arises between trading and settlement. Instead this risk is managed by the individual participants. Historically, this has not been a problem. Almost all transactions are completed according to agreement. The reason for transactions not being completed is that shares could not be delivered. There has always been liquidity. The replacement cost risk is not a source of loss in day-to-day operations but a deal that does not go through gives rise to large administrative costs.

The capacity to spread risk is more important, in relative terms, to foreign participants who have less incentives to make their own credit assessment of Swedish counterparties. For this reason, foreign participants call for central counterparty services to a greater extent than domestic participants. The Swedish market participants see the delivery guarantee offered by a central counterparty as a great advantage. This advantage is less important on the fixed income market, where securities are usually more liquid. The number of failed transactions increases when markets are turbulent. The advantage of a well-known counterparty with collateralised positions is greater under these conditions.

The possibility to transfer all counterparty risk to one set counterparty is important for risk management in anonymous trading. The anonymous trading in the Swedish stock market means that participants do not have any knowledge of whom they have counterparty exposures towards or any possibility of limiting these risks. At present, the anonymous trading in the fixed income market occurs within a small circle, which means that a redistribution of risk does entail limited gains. The situation will change if anonymous trading in fixed income instruments spreads beyond the interbank market. The market participants themselves wish to see a broader circle of participants in the Swedish fixed income market and are one of the driving forces behind the Stockholm Stock Exchange's electronic fixed income exchange.



Conclusions

A central counterparty for the securities market can contribute to efficiency gains by reducing costs both for settlement and risk management. Cost reduction can also lead to increased market liquidity. The advantages which a central counterparty offers increase the larger the market which it serves.

The current situation, in which equity trading and segments of fixed income trading are carried out anonymously, does not provide the basis for satisfactory management of counterparty risks. A central counterparty would rectify this situation and thereby increase the attractiveness of the Swedish market for foreign investors. Moreover, it would reduce the operational risks which market participants face and the costs associated with these.

Market participants must, however, weight the advantages of a central counterparty against the costs of establishing one. If the market can be integrated into an established central counterparty, whose technical system is already available, the costs may well be limited.

The disadvantage of a central counterparty is the ensuing concentration of risks and particularly operational risks. This concentration entails a risk for the financial system as a whole which can and must be management through public efforts to insure that the organisation, technical systems, risk management etc, are of the highest standard. For this reason supervision and oversight must be commensurate with the importance of the central counterparty for stability of the financial system.