

Securities settlement in Norway

How will developments in Europe affect the Norwegian system?

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The Norwegian securities settlement system was modernised in the spring of 2003, and the Norwegian Central Securities Depository (VPS), which had been a foundation, became a public limited company. Services related to securities settlements and the organisation of central securities depositories are also undergoing change in other countries. This article examines important changes in Norway and identifies some of the main trends in the Nordic countries and Europe in general. Against this background, we outline some possible future trends.

Securities are playing an increasingly important role in financing private and public activities and as a savings and investment instrument for households and enterprises. Market participants' perceptions of risk and profitability for different securities are affected by their confidence in the marketplaces where securities are traded. Smoothly functioning securities markets depend on the existence of safe, efficient securities settlement systems. Securities settlement systems are also very important for other payment and settlement systems, including those of central banks. This is partly because securities are used as collateral for various types of loans from the central bank. Thus, a smoothly functioning securities settlement system also affects the conduct of monetary policy.

The market value of listed Norwegian securities was NOK 1000 billion at the end of 2002, and stock market turnover averaged NOK 11.7 billion per day in 2002.² Because of the size and function of the securities markets, safe, efficient solutions for trading, clearing, settlement and ownership registration are very important. In Norway, most securities trading takes place on the Oslo Stock Exchange. The Norwegian Central Securities Depository (VPS) and Norges Bank handle settlement, while VPS handles clearing and registration.

The Norwegian systems are improved at regular intervals to provide Norwegian and foreign banks, brokers and investors with optimal conditions for securities trading. During the last few years, there has been considerable focus on making the Norwegian securities settlement system, VPO, safer and more efficient. The purpose of the Act relating to the Norwegian Securities Depository³, which entered into force on 1 January 2003, is to lay the foundation for safe, orderly and efficient registration of financial instruments (securities and derivatives) and appurtenant rights. The Act facilitated an important modernisation of the securities settlement process and abolished the VPS monopoly on securities registration. The main content of the Act is presented briefly in Box 1.

Systems for trading, settlement and registration of securities also change constantly in other countries. As a result of the EEA Agreement, Norwegian regulations must comply with the same requirements as regulations in EU member countries. The EU's work to establish a common capital market for member countries will also affect Norwegian systems. In addition, a number of international fora, both private and public, are preparing recommendations and standards for securities settlement systems. Of course, such international recommendations will also influence Norwegian systems and market participants.

This article starts with a brief description of how the Norwegian securities settlement system functions. We then consider the impact of the most recent modernisation on system safety and efficiency.⁴ The market structure and settlement systems are also being changed in other Nordic and European countries, and we examine some of these trends. Finally, we identify some of the challenges and opportunities that lie ahead for the Norwegian system. The article deals with securities, and other financial instruments, such as derivatives, are only mentioned by way of exception.

1. A brief description of the Norwegian securities settlement system

How do securities change owner?

The primary function of the securities market is to raise capital in the form of loan capital or equity (primary market) for private and public enterprises and to ensure that investors can easily trade securities, depending on what are favourable investment instruments, at any given time (secondary market).

New capital may be acquired by issuing new securities. A registrar registers these securities in VPS in the issuers' securities account.⁵ After the investors have registered as buyers (subscribed shares), a settlement

¹ Our thanks go to colleagues at Norges Bank and other Nordic central banks, in particular to Gunnvald Grønvik and Helge Eide, for helpful comments and contributions.

² By way of comparison, Norway's GDP was approximately NOK 1600 billion in 2002.

³ Titles of Acts are given in full in the literature list.

⁴ See Bruflot and Flatraaker (1997) and NOU (2000:10) for a more detailed description of the system prior to the changes.

⁵ A registrar is an enterprise that has been approved by VPS to manage securities accounts in VPS on behalf of the issuer or investor.

Box 1: The new Act relating to the Norwegian Securities Depository

The new Act relating to the Norwegian Securities Depository entered into force on 1 January 2003 and replaced the former Act relating to the Norwegian Securities Registry of 1985. With this change, VPS' legal monopoly as a securities depository was abolished, and a licence from the Ministry of Finance is now required of any entity wishing to operate as a securities depository. According to the Act, a securities depository shall be organised as a public limited company. Since a securities depository serves a very important function in the securities market, any winding-up shall in general be conducted according to the rules in the Bank Guarantee Act (Proposition no. 39 (2001-2002) to the Odelsting, p. 9) concerning the initiation of insolvency proceedings.

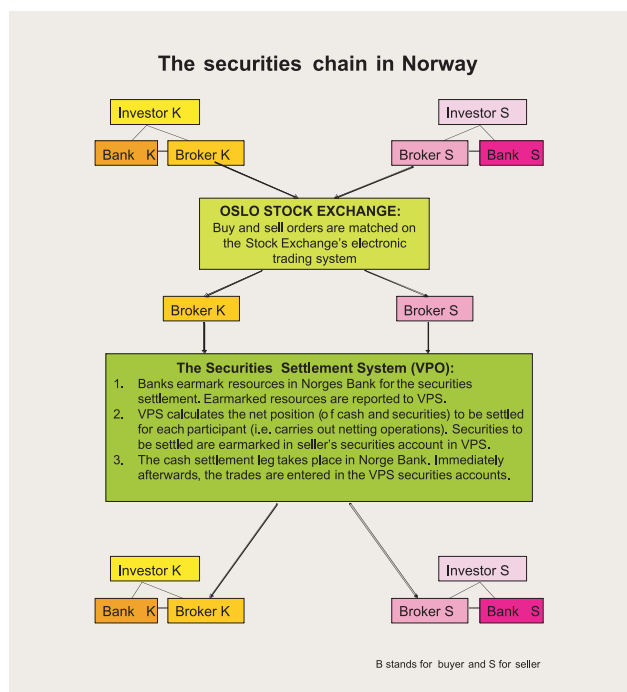
The purpose of the new Act is to lay the foundation for secure, orderly and efficient registration of financial instruments and appurtenant rights. An investor will be required to establish an account in a securities depository before acquiring financial instruments. One of the main purposes of such registration is to establish legal protection for various transactions. According to the new Act, rights in a securities depository take legal effect immediately after registration. An individual who has already entered a right in the depository will have priority over colliding rights (including claims from creditors) that have been submitted at a later time (Proposition no. 39 (2001-2002) to the Odelsting, p. 9).

All financial instruments may be entered in the securities depository. The Act requires registration for equities and subscription rights in Norwegian public limited companies and for Norwegian bearer bonds. Registration in a securities depository assumes that the rights are not connected with a physical document or that such a document has been destroyed, placed in safe custody or otherwise taken out of circulation.

The point of departure and main rule in Norway is that financial instruments are registered in the securities depository in the investor's name. In some cases, the custodian bank is allowed to register, which means that the name of the actual owner does not appear in the securities depository. The custodian bank must be approved by Kredittilsynet (Financial Supervisory Authority of Norway). Registration of equities by the custodian bank is not permitted for Norwegian investors (see the Norwegian Public Limited Companies act).

will be made where the issuing enterprise is the seller and the subscribing investor is the buyer. Somewhat simplified, we can say that a securities trade has been settled when the buyer has received the security and the seller has received the money and these transactions cannot be reversed. Securities that are settled in VPO do not exist in physical form but only as registrations in VPS. Transfer of ownership of the securities is executed by means of electronic registration in VPS.

The process that occurs from the time an investor decides to trade securities until the trade has been settled is called the securities chain. This process is presented schematically in Chart 1. The chart illustrates a trade that is initiated via a broker on the Oslo Stock Exchange (secondary market). Both the securities and the cash leg of the transaction are settled in VPO.⁶ The chart also illustrates settlement in the primary market, although the trade then takes place between the issuer and the investor.



Investors who wish to trade securities on the Oslo Stock Exchange must have an account with a broker and a bank, as indicated in the chart.⁷ A securities transaction is initiated when a broker (securities dealer) places a trade order in the Oslo Stock Exchange's electronic trading system, either on her own or on an investor's behalf. The trade order specifies the securities that the investor wishes to buy or sell, the volume and the bid price. The stock exchange's electronic system connects matching buy and sell orders, and trades are concluded continuously as soon as a buy and a sell order match with regard to price, volume and any other terms. The buying and selling brokers must then report the trade for settlement in VPO.

⁶ Transactions that are conducted without a broker are settled in accordance with special routines described in NOU 2000:10, p. 32.

⁷ This applies to investors that are not brokers or banks.

In addition to Norges Bank, which is responsible for issuing and trading government securities, 19 banks and 23 brokers currently participate in VPO. There are two securities settlements daily in Norway, one at around 6 am and one at 12 noon.

To simplify, we present the VPO process in three steps. First, prior to each settlement, banks must earmark funds to cover their expected position in the settlement. These earmarked funds are reported to VPS. The broker's financial positions in VPS are settled over the banks' accounts in Norges Bank on the basis of guarantee bank agreements.⁸ Therefore, the banks' expected position in a settlement is the sum of the positions of the brokers for whom the bank is a guarantor and the bank's own position.

The next stage in the process is that VPS clears each participant's net position in the settlement on the basis of stock exchange transactions that have been sent in to VPO for settlement. A net cash position and a net position for each security is calculated for all participants. The calculated net positions are multilateral, i.e. they represent the total net position of the participant in relation to the other participants in the settlement.⁹ Net settlement therefore saves liquidity for participants, in contrast to separate settlement of each individual transaction (gross settlement). Securities to be settled are reserved in the sellers' securities account in VPS.

The third and final stage of the process is the actual

cash settlement in Norges Bank and the book entry of the securities in VPS. As soon as the cash position is settled and entered in each bank's settlement account in Norges Bank, VPS enters the transactions in the securities accounts with immediate legal effect. Net positions amounting to about NOK 2.5 billion are settled daily in connection with securities settlements in Norges Bank.

As described above, investors do not participate in VPO unless the investor is a bank or a broker that is trading on their own behalf. After the securities settlement is completed, a cash settlement must be made between investors, brokers and banks, as shown at the bottom of the chart. Norwegian investors' stock transactions are entered directly in the investor's securities account in VPS.¹⁰ Foreign investors may register securities in the name of their bank. Such a bank is called a custodian bank and it has an account in VPS on behalf of the investor. With regard to bonds, both Norwegian and foreign investors may register in their own name or in the name of their custodian bank. Registration at the investor level is also very common in the other Nordic countries, while registration via the custodian bank is more common in other countries.

According to CESR/ECB (2003, p. 26), the standard settlement day in most countries is three days after the trading day (T+3 settlement, where T is the trading day). T+3 is also the standard in Norway, but same day settlement, or T+0 settlement, is also possible. All securities

Box 2: Risk in securities settlement

The following is a brief overview of the types of risk associated with securities settlement. More detailed definitions are provided in BIS (2001).

Credit risk

The risk of loss equivalent to the full value of a transaction. Participants in VPO are protected against this risk because the transfer of securities is linked to the transfer of payment in a way that ensures payment on delivery (Delivery Versus Payment - DVP). This means that the securities are transferred if and only if the cash settlement has been executed.

Liquidity risk

The risk that the cash or securities are not received at the agreed time.

Market risk (replacement risk)

The risk of loss because a trade is not settled as agreed, making it necessary to trade again at a less favourable price. Market risk depends on price volatility, the length of the settlement period and liquidity in the market.

Operational risk

The risk of error in computer systems and internal control. Operational risk may, for example, be the result of inadequate procedures, malfunctions in computer systems, a breach of rules, fraud, fire or terrorist attacks.

Legal risk

The risk of loss due to a lack of clarity or uncertainty about legal aspects of the settlement system.

Custody risk

The risk of loss when the custodian holding securities or money on behalf of others becomes insolvent or defaults.

Systemic risk

The risk that one market participant's financial problems will spread to others, thus threatening financial stability.

⁸ When brokers are part of a bank group, their transactions are settled over the bank's account in Norges Bank. Other brokers who participate in VPO must enter into an agreement with a bank regarding the right to draw on the bank's account in Norges Bank.

⁹ In such a settlement, the numerical value of participants' net debit positions and net credit positions is the same (zero sum game).

¹⁰ Norwegian investors" refers to investors that are resident in Norway (physical persons) or companies that are registered in Norway.

trading entails a certain degree of risk that the trades initiated cannot be settled on the agreed day. This risk may be due to the seller's lack of securities, the buyer's lack of sufficient cover or both.

The size of the Norwegian market and the degree of internationalisation

The market value of listed Norwegian securities was NOK 1000 billion at the end of 2002, while stock market turnover in 2002 averaged NOK 11.7 billion per day. According to the *Annual Report on Payment Systems 2002*, an average of approximately NOK 2.5 billion was settled in VPO daily (see Norges Bank 2003, p. 53). The amount has been roughly the same following the introduction of two settlements daily in March 2003. Approximately 90 per cent of the volume is settled in the morning settlement.

There are currently 44 brokers on the Oslo Stock Exchange. Fifteen of these are remote members, i.e. brokers that are not established in Norway. Roughly 27 per cent of the market value of shares listed on the Oslo Stock Exchange was owned by foreign investors in 2002, but they accounted for more than 50 per cent of the transactions.

2. Developments in the Norwegian securities settlement system

The new Act relating to the Norwegian Securities Depository has made it possible to modernise the Norwegian system to bring it into line with international recommendations in the area.¹¹ The Act abolishes VPS's exclusive right to register securities in Norway and provides for important changes connected with settlement and collateralisation. According to the old Norwegian Securities Registry Act of 1985, rights registered in VPS were not protected under the law in the event of bankruptcy until the day after registration. Therefore, securities settlement and collateralisation of securities in VPS were executed only once a day. According to the new Act, rights in VPS are legally binding immediately upon registration. The systems for both settlement and collateralisation were therefore modernised in spring 2003. The modernised VPO now has two net settlements daily and it is possible to settle a trade on the same day that it is initiated on the stock exchange (T+0 settlement). Two-thirds of the collateral used by banks for various types of loans in Norges Bank is collateralised in VPS. This collateral may now be changed through the day with immediate legal effect. This may contribute to making the money market more efficient and to simplifying monetary policy management.

Conversion of VPS

VPS was established in 1985 as a self-owned foundation and in spring 2003 was converted to a public limited company through an initial public offering. The conversion is described in the prospectus from VPS (see VPS 2003). VPS is now mainly owned by the largest users, a model that is also common in other countries. In some countries, the central bank is also a shareholder, but

Box 3: The authorities' role and responsibility in connection with securities settlement.

Norges Bank

According to the Norges Bank Act, "Norges Bank shall promote an efficient payment system domestically as well as vis-à-vis other countries." Efficiency is also contingent on systems that are sufficiently robust. As settlement bank for the cash leg of securities settlements, Norges Bank will regularly evaluate the significance of these settlements for financial stability (see Norges Bank 2002, p. 11).

Pledged securities in VPS account for approximately two-thirds of the value of banks' collateral for loans in Norges Bank.

The Ministry of Finance

VPS's registration activities are subject to a licence from the Ministry of Finance (see Act relating to the Norwegian Securities Depository, chapter 3). VPS was granted such a licence on 29 January 2003.

Kredittilsynet (Financial Supervisory Authority of Norway, previously the Banking, Insurance and Securities Commission)

Kredittilsynet's activities are regulated by the Financial Supervision Act. Section 3, paragraph 1 states that "The Banking, Insurance and Securities Commission shall ensure that the institutions that it supervises operate in an appropriate and proper manner in accordance with law and provisions issued pursuant to law and with the intentions underlying the establishment of the institution, its purpose and articles of association." VPS is subject to Kredittilsynet's supervision (Act relating to the Norwegian Securities Depository, Section 10, paragraph 1 and the Financial Supervision Act, section 1, paragraph 11).

Unlike the registration activities of VPS, a licence is not required for the securities settlement system (VPO). According to the Payment Systems Act, such a system must be approved by Kredittilsynet in order to be covered by the Act's legal protection rules for clearing and settlement agreements. VPO has had such approval since 6 June 2001.

¹¹ See for instance the BIS and IOSCO recommendations concerning measures to reduce risk associated with securities settlements (see BIS/IOSCO (2001 and 2002)).

Norges Bank has decided not to own shares in VPS. Sveriges Riksbank has chosen the same solution.

VPS must give other market participants access to the VPS depository if they so desire.¹² This means that registration and settlement can in principle be executed in separate institutions. This change in type of company will make it easier for VPS to enter into alliances and cooperation with other national market participants, and will allow for mergers with central securities depositories in other countries. It must be assumed, however, that the barriers to entry are considerable for this type of operation, in both the Norwegian and other securities markets.

Functional changes in VPO

Improved predictability in VPO

Previously, transactions were netted in VPO each evening despite the fact that VPS had no information about how much money the participants had available for the settlement. Consequently, there was no guarantee that the settlement would be approved in Norges Bank's balance check the next morning. The settlement was never rejected by Norges Bank, but delays due to brokers' lack of cover were not unusual.

As of the spring of 2003, banks were required to earmark funds in Norges Bank for the securities settlement. These amounts are entered as constraints when transactions are netted in VPS, and the arrangement therefore places greater demands than previously on banks' liquidity management. If banks have not allocated adequate liquidity, transactions for which cover is lacking will be postponed until the next settlement. This ensures that settlements are not delayed pending participants' acquisition of financial cover, and settlements in Norges Bank are now executed at fixed times of the day. VPO has thus become more predictable and more in line with international recommendations in this area.

Is VPO more efficient?

Settlement of transactions that lack cash or securities cover in the morning settlement is automatically postponed until the second settlement of the day, at which time settlement is executed if there is cover. The introduction of two settlements daily thus means that more transactions can be settled on the agreed day. On the other hand, splitting the transactions into two settlements may in principle result in less favourable netting and thus somewhat reduced settlement efficiency. Since about 90 per cent of the transaction volume is settled in the first settlement, however, this effect is probably limited. In addition, final settlement of securities and cash can take place on trading day (T+0 settlement). One

advantage of T+0 settlement is that investors' exposure to liquidity and market risk is short-term, while a disadvantage is that brokers have little time to raise cover for the settlement. Irrespective, participants in VPO now have a wider range of choices, which can increase settlement efficiency.

VPO was also modernised in the years before the introduction of the new Act relating to the Norwegian Securities Depository. In 1999, VPS implemented an optimisation model for clearing and a securities borrowing scheme as an integrated part of cover check in VPS. So far, only foreign lenders have participated in this scheme. This is because Norwegian market participants' securities lending has been taxed on a par with sale, making securities lending unattractive. It has now been decided that these tax rules will be changed, and this will probably increase liquidity in the borrowing scheme and result in the settlement of a larger number of transactions on the agreed day.¹³ This is also in line with international recommendations. As a result of the improvements, the portion of transactions that are settled on the agreed day has increased from roughly 80 per cent at the end of the 1990s to the current level, which is about 97 per cent (see VPS 2002, p. 15).

3. Developments and trends in Europe

Background: past and present

Historically, each country has had its own securities system with trading, clearing and settlement in the country's own currency. Trading has taken place on the national stock exchange, securities settlement has been executed in the country's central securities depository and the cash leg has been settled at the central bank.¹⁴ Both regulations and practice have often favoured domestic trades and the central securities depositories have usually had a statutory monopoly in their own country. The national securities settlement systems have focused activity on domestic transactions in domestic currency, while cross-border securities trading has generally gone through banks.

In the last few years, technological developments, deregulation of capital markets and an increase in cross-border trade have changed this picture. National statutory monopolies have been abolished, and many market participants are expanding their services and seeking new markets with the aid of new technology. International recommendations and harmonisation of regulations and practice in the EU have also had an impact on developments. International recommendations have been developed in tandem with technological developments and have promoted modernisation of the

¹² Potential competitors may also choose to establish their own registries.

¹³ Proposition No. 42 (2002-2003) to the Odelsting "Om lov om endringer i skatteloven mv. (Concerning the Act relating to amendments in the Taxation Act etc.*)" was approved by the Odelsting on 8 May 2003 and by the Lagting on 27 May 2003. It has not yet been decided when the amendments will enter into force.

¹⁴ See Padoa-Schioppa (2002) and Sveriges Riksbank (2003).

systems in many countries, including Norway. The introduction of the euro has played a significant role for the EU countries, especially for those in the euro area. The elimination of foreign exchange risk in connection with cross-border trades in this area has been important. Padoa-Schioppa (2002, p. 12) points out that investors are increasingly making cross-border trades within the euro area and this increases demand for a common infrastructure.

Increased cross-border trading and improved opportunities for fast settlement and less risk influence system design trends. In the following, we will focus on three main issues: cash settlement in the central bank or a private bank, net or gross settlement and finally, settlement with exposure to an unknown counterparty or a central counterparty.¹⁵ First, we will briefly review trends in the redesign of infrastructure for securities trading and settlement.

Dominant trends

*Consolidation, integration and automatisisation*¹⁶

The rapid technological developments in the last few decades have provided new possibilities for securities settlements systems and have made it possible to integrate, consolidate and automatise systems in a completely new way. Automatisisation allows for STP (straight through processing), which means that all necessary functions in the securities chain are integrated. This means that the entire process, from the initiation of a trade to settlement, is completely automated. A system using STP can reduce the time lag between the conclusion of a trade on the stock exchange and settlement and registration, and reduces the risk of manual error. Integration implies that various market operators' systems are linked together (technically), thus enabling them to send transactions back and forth. This makes it easier to send transactions to systems in other countries.

Consolidation of the securities infrastructure encompasses mergers, acquisitions, outsourcing, alliances, joint ventures and reorganisation of financial institutions. Consolidation may be horizontal or vertical. Horizontal consolidation entails the merger of institutions with the same functions and responsibilities, whereas vertical consolidation involves a merger of organisations that perform different services in the securities chain. Horizontal consolidation paves the way for acquiring larger market shares and helps to cut costs

because of the economies of scale characterising infrastructure services in the securities market. Vertical consolidation may result in an enterprise performing several or all services involved in trading (i.e. the enterprise may be a market place, a depository, a clearing and settlement house, a bank, a broker and a central counterparty.) The primary advantage of vertical consolidation is that STP becomes simpler and that customers only have to relate to one market operator and one set of standards and routines.¹⁷

Efficiency gains and risk reduction have been the drivers behind the consolidation and automatisisation trends. Both market participants and central banks in the EU and the G-10 countries have worked towards such a development by, among other things, preparing international recommendations (see Box 4). The EU is seeking to promote rules and regulations that are conducive to market-based consolidation and automatisisation. Such a development may facilitate cross-border securities trading and thus contribute to a more efficient and safe inner market. Accordingly, extensive work is under way to harmonise the regulations and practices in the EU countries and remove national barriers to integration and consolidation.¹⁸ Although the EU authorities are seeking to promote cross-border consolidation and cooperation, it is up to the market participants to exploit the possibilities afforded by a level playing field.

Consolidation and automatisisation may help to stabilise the financial infrastructure and increase efficiency in the securities markets (See Sveriges Riksbank (2003), p. 65). On the other hand, consolidation may also raise politically sensitive and complicated issues with regard to national considerations and competitive conditions between different market participants, for example securities depositories and banks.¹⁹ Consolidation may also increase operational vulnerability because one market participant's operational problems will have an impact on others. A breakdown in a consolidated infrastructure probably results in higher systemic risk, higher risk of contagion and appurtenant high costs. Horizontal consolidation may also imply a monopoly for a market operator in a large geographical area where a number of competitors operated previously. Potential problems connected with a monopoly may, however, be alleviated by means of regulations.²⁰ Consolidation that results in cross-border systems challenges market participants to cooperate across traditions, language and culture and imposes strict demands on global standards.

¹⁵ A central counterparty is a market operator who steps in as a legal counterparty between buyer and seller in a trade.

¹⁶ A more detailed review of trends up to 2001 is provided in Weme and Axelsen (2001).

¹⁷ STP may also be implemented with horizontal consolidation. Participants in a consolidated securities depository which is common to several countries may then execute trades with each other quickly and without manual handling.

¹⁸ See European Parliament (2002), Giovannini Group (2002 and 2003) and Committee of Wise Men (2001).

¹⁹ Consolidated central securities depositories may, for example, take over banks' services connected with cross-border settlement services (see Sveriges Riksbank (2003, p. 65) and Berg and Kruse (2000, pp. 140-141).

²⁰ Padoa-Schioppa (2003, p. 11) points out that the EU Commission has focused on ensuring that barriers to entry for incumbent market operators should be minimised and that users should have maximum freedom of choice. This type of solution may, however, be difficult to implement in practice because it is expensive and technically complicated.

Box 4: International recommendations

The most important international recommendations (the list is not complete) are described briefly below.

The first important international initiative came in 1988 with the report *Clearance and Settlement in the World's Securities Markets* from the Group of Thirty. This report recommended establishing a central securities depository in all national securities markets for electronic recording of securities.

In 1990, the central banks in the G-10 countries established the Committee on Payment and Settlement Systems (CPSS) as a forum for monitoring and analysing domestic and cross-border settlements. CPSS has prepared a number of international recommendations. The Bank for International Settlements (BIS) has supported this initiative by providing facilities for the secretariat and publishing the recommendations. In 1992, the BIS published the report *Delivery Versus Payment in Securities Settlement Systems* (BIS 1992). The report outlines models of how participants in the settlement can be protected against credit risk, both in gross and net settlements.

Since the middle of the 1990s, there has been considerable focus on risk and efficiency in connection with cross-border settlements. The BIS report *Cross-Border Securities Settlement* discusses, among other things, international central securities depositories (BIS 1995). There are a number of international reports on this subject and in the autumn of 2002, the Group of Thirty published a report called *Global Clearing and Settlement of Securities. A Plan of Action* (Group of Thirty 2002).

In 1998, the European Central Bank's predecessor, the European Monetary Institute (EMI), published Standards for the use of EU securities settlement sys-

tems in ESCB credit operations. Requirements concerning settlement based on delivery versus payment – DVP – and settlement in central bank money by 2002 led to modernisation of the systems in a number of countries. (EMI 1998)

According to Financial Services Action Plan, one of the EU's goals is to create an integrated financial market by 2005. To achieve this, it is necessary to modernise the processes for cross-border securities settlement. National tax rules and questions regarding legal security may constitute barriers that must be eliminated. A number of EU reports on these subjects have been prepared (European Parliament 2002, Giovannini Group 2002 and 2003 and Committee of Wise Men 2001). Legal security is taken account of in the EU's Directive on Settlement Finality from 1998.

From a global perspective, the BIS and the International Organization of Securities Commissions (IOSCO) published 19 recommendations for securities settlements in 2001 (BIS/IOSCO 2001). These recommendations and the appurtenant methods report from 2002 (BIS/IOSCO 2002) are used in the IMF's Financial Sector Assessment Program.

Under the auspices of the European System of Central Banks (ESCB) and the Committee of European Securities Regulators (CESR), a working group was established in 2001 to assess the BIS/IOSCO recommendations from a European perspective. In the summer of 2003, the group published its consultative report *Standards for securities clearing and settlement systems in the European Union* (CESR/ECB 2003). The 19 standards are based on the BIS/IOSCO recommendations but have been adapted to conditions in the EU. When the standards are in their final form and efforts to limit the scope of the standards are finalised, the standards will be more binding for the members than the BIS/IOSCO recommendations.

Settlement in a central bank or a private bank?

Settlement of the cash leg of securities transactions has traditionally been made via banks' accounts at the national central bank, primarily because there is no credit or liquidity risk associated with deposits in the central bank. In general, the central banks, in their capacity as settlement bank, have laid down requirements as to the design of the system and monitored its effect on the country's financial stability, in line with international recommendations.

Demand for systems providing settlement in a number of currencies has risen as cross-border trade has become

an increasing trend. This kind of system is operated by the two international central securities depositories (ICSDs) in Europe, Euroclear and Clearstream, both of which provide cash clearing and securities settlement services. This is possible because Euroclear and Clearstream also offer banking services. In a multi-currency settlement system, central bank settlements can be impractical since no international central bank offers settlement in several currencies (see Padoa-Schioppa 2002, p. 13). According to international recommendations, assets used to settle the ultimate payment obligations arising from securities transactions should carry little or no credit or liquidity risk. If central bank money

is not used, steps must be taken to protect members of central securities depositories (CSDs) from potential losses and liquidity pressures arising from the failure of the cash settlement agent whose assets are used for that purpose. Participation in the European System of Central Banks for credit operations, however, requires settlement of pledged securities in a system based on central bank money (EMI, 1998, p. 12).

Types of settlement – gross, net or both?

International recommendations can be followed whether transactions are settled individually (gross settlement) or on a net basis. In principle, gross settlement requires more liquidity than net settlement, in terms of both cash and securities. Liquidity is costly for participants, and as the day proceeds, managing liquidity becomes more important as the need for liquidity increases. Costs can be reduced, however, by using lending arrangements for both securities and cash and systems that optimise the use of liquidity. Net settlement is based on a specified number of settlements per day at designated times. In the event of failure to settle, the payment transaction is postponed to the next designated time. With gross settlements, on the other hand, trades can be settled as soon as cover is available.

Gross and net settlement systems are both available in Europe, and some clearing houses offer both settlement arrangements, enabling participants to choose the most suitable solution for each trade. The Danish securities settlement system, like the Norwegian system, is based on a number of fixed net settlements that include both equities and bonds. Both in Denmark and Norway, the bulk of transactions are completed during the first settlement on the settlement day. The Danish system also includes settlement in euro, and the system is synchronised with settlements in Euroclear.²¹

Up to autumn 2003, Sweden had net settlements once every morning. These settlements were completed in the form of four independent net settlements: equities in Swedish kroner, equities in euro, bonds in Swedish kroner and bonds in euro.²² Finland has had one net settlement for equities per day and gross settlement for bonds. Sweden and Finland are changing to new systems based on gross settlement in autumn 2003. Both the new Swedish system (NewClear) and the new Finnish system (HEXClear) include functions for liquidity optimisation so that as many transactions as possible are settled. Optimising is achieved, for example, by settling several individual transactions at the same time.²³ The decision made by Sweden and Finland to change to gross settlement-based systems is largely based on the aim of promoting cross-border trade.

The new Act relating to the Norwegian Securities Depository provides for the introduction of gross settlements in the Norwegian securities settlement system, but no decision has been made to establish such a system.

Central counterparty

A central counterparty (CCP) is an entity that interposes itself as a legal counterparty between buyer and seller in a securities trade so that buyer and seller do not deal directly with each other. The buyer and seller only have risk in relation to the CCP, and not in relation to each other. All securities trading entails a certain degree of risk that trades cannot be settled on the agreed day because of insufficient cover. By settling via a neutral counterparty, buyer and seller avoid exposure to this risk from an unknown counterparty. Market and liquidity risk in the event of a default of a participant is thereby borne by the CCP for a fee paid by the participants. In these situations, the CCP may impose fines and provide compensation in the form of cash or securities to the relevant market participants.

The total market and liquidity risk associated with settlement through a CCP can be reduced compared with normal trading. The reason for this is that the CCP can control its risk more effectively than individual participants in a trade, partly through risk diversification. A CCP can also offer other services, for example services relating to anonymity and services facilitating cross-border settlement. CCPs often also offer liquidity-saving functionality to participants, for example through netting of positions.

CCPs have traditionally been offered in connection with trade in financial derivatives. Over the past few years, there has been an international trend towards increased use of CCPs in securities settlements and particularly when large amounts and cross-border trades are involved. The London Clearing House, Clearnet and Eurex Clearing offer CCP services in connection with securities settlements (cf. Table 1).

In Norway, no CCP has been established for securities settlement, but the Norwegian Futures and Options Clearing House (NOS) acts as a CCP for derivatives trading. NOS also acts as central counterparty in the lending arrangement for securities offered in connection with securities settlements. The VPS states in the prospectus for the public offering (VPS 2003, p. 36) that the Nordic securities depositories, stock exchanges and banks have jointly assessed the need for and alternative models for a CCP in the Nordic region. The VPS points out that even though there is little need in the Norwegian market for a central counterparty, a CCP solution should be offered to international market participants as this is

²¹ A more detailed explanation of the synchronisation with Euroclear is given in Berg and Kruse (2000, p. 133). In Denmark, participants are also offered simple functionality for gross settlements without liquidity-optimising functions, although this is not used to any extent.

²² Modernisation in Sweden is explained in more detail by Sveriges Riksbank (2002, pp. 55-56). A gross settlement arrangement such as that for Denmark, mentioned in footnote 21 above, has also been available to Sweden.

²³ In its initial phase, NewClear will have some designated settlement times every day, but the system allows for settlement on a continuous basis throughout the day.

a well-known, internationally used settlement method. According to the prospectus, the VPS aims to establish CCP solutions for the Norwegian market in the next few years. The VPS can establish these solutions alone or in collaboration with other actors.

In principle, a CCP can be organised in a number of ways. The models known to us are based on gross securities settlement, where a CCP function is offered only for the most liquid securities. It is also possible to offer the function on a voluntary basis, so that national investors can settle trades without using a CCP. Transactions can also be sent via a bank to an international CCP.²⁴

There is no legal obstacle to establishing a CCP in Norway. Norwegian legislation has been modernised to provide for sound management of a CCP arrangement, and the Securities Trading Act contains rules that apply to the establishment of both Norwegian and foreign CCPs. The legal requirements applicable to a CCP are the same for both derivatives settlement and securities settlement. These requirements include authorisation from the Ministry of Finance and supervision by Kredittilsynet. The Securities Trading Act includes requirements with regard to risk mitigation, safety and appropriate capital for a CCP.

The most recent international recommendations relating to securities settlement concern the question of CCPs. The Group of Thirty (2002, pp. 8-9) recommends that the use of CCPs should be expanded and that market participants and relevant public institutions should collaborate on these issues.²⁵ The Group of Thirty expects the benefits to outweigh the costs in most markets.

The Bank for International Settlements (BIS) and the Technical Committee of the International Organization of Securities Commissions (IOSCO) also recommend that the costs and benefits of a CCP be evaluated while at the same time emphasising the need for a sound legal basis. It is stressed that the risk undertaken by a CCP should be carefully managed. Neither the G30 nor BIS and IOSCO recommend without reservation that a CCP

should be introduced in settlement systems in all countries. Whether the benefits outweigh the costs depends on the size of the market, the extent of cross-border trade and participants' demand and willingness to pay for this function. As the ECB points out (2003, p. 49), there is widespread consensus among market participants that clearing with a CCP will play an increasingly important role in reshaping the securities markets.

Infrastructure in the Nordic countries and Europe

Major constellations in Europe

The European infrastructure for securities trading and settlement has been changed in recent years and the focus has shifted from national markets to solutions that serve the needs of both national and international markets. This has resulted in more integrated systems, domestic and cross-border consolidation and increased automation. However, the most prominent change in Europe is the establishment of some major clearing and settlement bodies, with Europe's two international central securities depositories Euroclear and Clearstream in separate constellations.

Sveriges Riksbank (2003, p. 60) points out that the European infrastructure is defined by three constellations in particular: the UK market (London), a group including the French stock exchange, and a group concentrated around the German stock exchange. In the London market, trading is carried out on the London Stock Exchange, while the London Clearing House is the CCP. Securities settlement is provided by CRESTCo, with cash settlement at the Bank of England. The Paris, Amsterdam and Brussels stock exchanges merged in autumn 2000 to form the pan-European stock exchange Euronext. Clearnet is the CCP, while settlement services are provided by Euroclear.

Following the merger in 2002, CRESTCo is now part of the Euroclear group.²⁶ The merger made a substantial contribution to horizontal consolidation of the infrastructure of CSDs in Europe. The group is in the process

Table 1. Infrastructure for securities trading and settlement in selected European countries.

Function	UK	France, Netherlands, Belgium	Germany, Luxembourg
Market place	London Stock Exchange	Euronext	Deutsche Börse ⁽²⁾
Central counterparty (CCP)	London Clearing House	Clearnet	Eurex Clearing ⁽²⁾
Securities settlement, register	CRESTCo ⁽¹⁾	Euroclear ⁽¹⁾	Clearstream ⁽²⁾
Cash settlement	Bank of England	Respective central banks	Germany: Bundesbank, Luxemburg: Clearstream

⁽¹⁾ CRESTCo and Euroclear are part of the same group.

⁽²⁾ Deutsche Börse, Eurex Clearing and Clearstream are part of the same group.

²⁴ For a closer study of services and risk management in central counterparties, see Sveriges Riksbank (2003), Knott and Mills (2002) and Hills, Rule, Parkinson and Young (1999).

²⁵ The Group of Thirty was established as a private, non-profit international body composed of very senior representatives of the private and public sectors and academia (see www.group30.org for more information).

²⁶ For more information, see www.crest.co.uk, www.euroclear.com and press release of 23 September 2002.

Table 2. Infrastructure for securities trading and settlement in the Nordic region

Function	Norway	Iceland	Denmark	Sweden	Finland
Market place	Oslo Stock Exchange	Reykjavik Stock Exchange	Copenhagen Stock Exchange	Stockholm Stock Exchange (1)	Helsinki Stock Exchange (1)
Securities settlement, depository	VPS	ISD ⁽²⁾	VP	VPC	APK ⁽¹⁾
Cash settlement	Norwegian central bank	Icelandic central bank	Danish central bank	Swedish central bank	Finnish central bank

⁽¹⁾ The Stockholm Stock Exchange, the Helsinki Stock Exchange and APK are part of the same group.

⁽²⁾ The Reykjavik Stock Exchange and ISD form part of the same group (from June 2002).

of integrating its systems by developing a joint settlement system for Euronext and the London Stock Exchange, to be completed by 2005. The London Clearing House and Clearnet also plan to merge under the name of LCH Clearnet. This merger will be an important horizontal consolidation of the infrastructure for CCPs in Europe.²⁷

As mentioned above, Euroclear and Clearstream are both ICSDs that offer settlement in a number of currencies. Clearstream is also the national CSD in Germany and Luxembourg, while Euroclear plays a similar role for the UK, France, the Netherlands and Belgium. The cash leg of the settlement is conducted in the respective central banks, except for Luxembourg where this leg is handled by Clearstream.

The third major constellation is based on a model for vertical consolidation, with trading (Deutsche Börse), CCP (Eurex Clearing) and settlement (Clearstream) within one and the same group. This vertical consolidation was completed in July 2002 with the incorporation of Clearstream into the Deutsche Börse Group²⁸.

Table 1 provides an overview of important centres for securities trading and settlement in Europe today.²⁹

Even though securities settlement in Norway is handled by VPS and Norges Bank, Norges Bank is linked up to both Euroclear and Clearstream as about 30 per cent of the collateral used by banks to obtain loans in Norges Bank consists of securities registered in these two ICSDs.

Infrastructure and participants in the Nordic region

Typical characteristics of the Nordic markets have been a lack of integration and a large number of institutions. Despite a number of attempts to establish cooperation and alliances over the past few years, the Nordic countries have largely retained their original infrastructure with a stock exchange and CSD in each country. This picture changed somewhat from 4 September 2003 with the merger between the Swedish OM (owner of the Stockholm Stock Exchange) and the Finnish stock

exchange HEX to form a new company, OMHEX.³⁰ OMHEX has two divisions, OM Technology and HEX Integrated Markets. The latter includes the Stockholm Stock Exchange, the Helsinki Stock Exchange, the Finnish Central Securities Depository (APK) and stock exchanges and CSDs in Estonia and Latvia. A central counterparty for securities settlement in the Nordic region has so far not been established. OMHEX, however, is planning to establish a joint Nordic-Baltic central counterparty for securities.

The stock exchanges in Copenhagen, Stockholm, Reykjavik and Oslo have signed a cooperation agreement to form an alliance called NOREX. The alliance enables the stock exchanges in the different countries to use the same trading system and offers joint membership. The individual stock exchanges have retained the share quotations and trading they had before the alliance was formed.

Table 2 shows the institutions that offer securities trading and settlement services in the Nordic region.

Sveriges Riksbank (2003, p. 61) points out that technological developments in the Nordic countries are advanced, and that the degree of automation is generally high. It is, however, difficult to achieve full straight through processing as long as trading and settlement procedures are not fully integrated.

Sweden, Finland, Iceland and Norway will be introducing new systems or making changes to their existing systems in the course of 2003. The settlement systems in Sweden and Finland have been modernised largely to promote cross-border trade. Modernisation also prepares the systems for the possibility of linking settlement to a future central counterparty, for example through OMHEX.

4. Challenges and opportunities for the Norwegian system

International recommendations identify principles for risk management and efficiency in securities settlement systems. The recommendations allow for different system designs, so that they can be met in both gross and

²⁷ For more information see www.clearnetsa.com and www.lch.com.

²⁸ For more information, see www.clearstream.com.

²⁹ For more information, see ECB (2003, especially p. 535) and the relevant websites.

³⁰ For more information, see www.omhex.com and OMHEX press releases of 4 September 2003.

net systems, systems with or without a CCP, and systems based on cash settlement in a central bank or a private bank. When choosing functions in a system, private CSDs must identify what is in demand in their market.

In developing the Norwegian securities settlement system, both VPS and Norges Bank have placed emphasis on international standards and recommendations. The securities settlement system is therefore mainly consistent with all the important international standards. Moreover, as a member of the EEA, Norway has implemented EU requirements in national legislation, in line with EU countries.

Securities settlement systems are undergoing constant development to improve efficiency and security. Private CSDs must assess settlement services on a continuous basis against demand and users' willingness to pay. Being the settlement bank for securities trades allows the central bank to influence the way settlement is conducted. For example, central banks decide on the most appropriate settlement order. They can also steer demand towards more efficient solutions through the terms and prices they set for the various services. In addition, the central banks of the EU and G10 countries are drawing up common recommendations for these systems.

Like other national CSDs in Europe, the VPS is now a limited company with no monopoly position. This presents new opportunities and new challenges. Possible developments in the period ahead are presented in the following.

Possible developments in the next few years

The current securities settlement system may be developed in various ways. The introduction of more than two net and/or gross settlements will afford additional opportunities during the day to settle transactions for which there is initially insufficient cover. Same-day trading and settlement will also be possible for a longer part of the day than is the case with today's relatively short window.³¹ The time window can also be expanded by postponing the morning settlement until a later time in the day. Opening the stock exchange earlier in the morning will have the same effect. .

An increase in the volume of cross-border trading may boost participants' demand and willingness to pay for the establishment of links between CSDs to facilitate settlement of cross-border trades. Settlement on a trade-by-trade basis (gross) is often regarded as the most suitable method in this context. It is, however, also possible to synchronise net settlement in different countries to promote cross-border settlement.

If securities are quoted on the Oslo Stock Exchange in foreign currency, settlement must be conducted in a private bank as Norges Bank only offers settlement in

NOK. The VPS is aware of this and, in collaboration with Den norske Bank, the largest private Norwegian bank, has developed systems for settlement in EUR and USD (see VPS 2003, p. 36).

The conversion of the VPS into a public limited company makes it easier to collaborate and possibly merge with other institutions, providing the possibility of efficiency gains and promoting automation (STP) in the securities chain. A merger between national institutions may also facilitate various forms of cooperation with foreign institutions.

A joint Nordic-Baltic solution where one or more settlement currencies are included may also be a possibility for the future. Further cooperation and consolidation within or outside OMHEX is also a viable option. Nordic-Baltic consolidation can create a joint Nordic-Baltic domestic market that will probably be more competitive in relation to other markets. In order to facilitate further consolidation, issues connected with governance, the location of the main office and job distribution must be resolved.

CSDs in most European countries, including Norway, are members of the European Central Securities Depositors Association (ECSDA).³² The two international CSDs Euroclear and Clearstream are also members. The ECSDA has developed a standard for establishing links between CSDs in order to facilitate settlement of cross-border trades. The ECSDA will probably continue to play an important role as a forum for cooperation between the national and international CSDs in Europe.

Possible long-term developments

Developments in trading patterns and trading volume in domestic markets and across borders may influence the settlement services that are in demand and the requirements imposed on settlement systems by national and international authorities. Trading volumes, for example, will be affected by the extent to which investors place funds in interest-bearing securities and equity instruments rather than bank deposits.

In addition, trading patterns may shift towards stock exchanges that are open 24 hours a day in many countries. In a few years' time, it may be possible for anyone wishing to do so to trade securities directly on multi-national stock exchanges via the Internet, with multicurrency real-time settlement in their own cash and securities accounts. This would require access to cash and securities in real time, possibly using a form of credit card. A third party would then be required to guarantee the settlement of both cash and securities for an appropriate fee. However, how costly this solution will be is currently a very open question and the extent of the demand for this type of technology is unknown.

The range of options available to users may also be

³¹ It is currently only possible to conduct trades with same-day settlement from the time the stock exchange opens at 10 a.m. until the deadline for registration of transactions for the morning settlement at 11.30 a.m.

³² For more information, see www.ecsda.com.

greater in most markets in the future, enabling them to choose between various settlement solutions such as net or gross, with or without a central counterparty, and cash settlement in a private or a central bank. The services that are in demand will probably continue to vary widely between different types of investor.

It is also possible that both national and international CSDs will have a role to play in the long run, although the division of tasks between them may be different. The national CSDs will probably focus in particular on settlement and registration of national securities, while international CSDs will probably offer a wide range of services. International CSDs will thus supplement rather than replace national CSDs. National systems may include various options for more advanced solutions, offered via a link to the large international systems.

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