



NORGES BANK

**FINANCIAL
INFRASTRUCTURE
REPORT
2014**

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Norges Bank
Oslo 2014

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MAIN POINTS

A well-functioning economy is based on a robust and efficient financial infrastructure. A failure in the payment system or the securities settlement system would bring large segments of the economy to a halt. System owners must therefore comply with strict requirements to minimise risk in these systems.

The *Financial Infrastructure Report* is part of Norges Bank's work to promote a robust and efficient financial infrastructure. Norges Bank's Executive Board discussed the *Report* at its meeting on 7 May 2014.

Norges Bank has important responsibilities related to the financial infrastructure. These responsibilities include promoting an efficient payment system in Norway and vis-à-vis other countries, in accordance with Section 1 of the Norges Bank Act. Norges Bank supervises systems for clearing and settlement of interbank payment transfers, in accordance with the Payment Systems Act, and the Bank oversees the payment system and the securities settlement system in line with international principles.

In Norges Bank's assessment, the financial infrastructure in Norway is on the whole robust and efficient. Although there were few disruptions in interbank systems and the securities settlement system in 2013, there is room for improvement.

One of the challenges in the financial infrastructure is related to extensive outsourcing of IT system operations. Even though system operators must comply with strict risk management requirements, system owners must not lose sight of their responsibility for system operations. Norges Bank stresses that sound management of operational risk related to the technical operation of payment and settlement systems is a challenge.

Key components of the Norwegian payment system are operated by the Nets Group. In March 2014, the owners, primarily Danish and Norwegian banks, agreed to sell Nets Holding A/S to Advent International, ATP and Bain Capital.

Norges Bank is currently considering a new agreement between the NICS Operations Office and Nets Norge Infrastructure AS on the operation of the NICS clearing system. In its deliberations, Norges Bank will give weight to ensuring that the agreement guarantees sound control of outsourced operations by the NICS Operations Office.

In Norges Bank's view, the Norwegian payment and settlement systems are in line with most of the new

international principles for such systems. Each system has been evaluated based on owners' self-assessments. The evaluation was conducted by Norges Bank in collaboration with Finanstilsynet (Financial Supervisory Authority of Norway) and the results are presented in this *Report*.

Banks have promoted cost-intensive international payment cards to the detriment of the more cost-efficient Norwegian payment card system BankAxept. Banks' profit margins on international payment cards have been relatively high, while margins on BankAxept have been lower. It has probably been possible to increase the use of costly solutions because the costs are paid by merchants and not by users. A new EU regulation will create common rules for interchange fees by introducing maximum fee levels for card-based payment transactions. This will likely reduce payment costs for merchants and the total economic cost of payment services. Norges Bank also supports a proposal for European regulation to allow customers using cards holding multiple applications to freely choose the payment system they wish to use at point-of-sale (POS) terminals. At the same time, it is important that customers are sufficiently knowledgeable about the applications to be able to take well-informed decisions.

Norges Bank emphasises that so-called virtual currencies can entail substantial risk for users as they are not regulated and are not issued or guaranteed by a central bank. The choice of means of payment is nonetheless a civil law matter between two parties. No-one is obliged to accept virtual currencies as payment. Norwegian notes and coins are the only form of legal tender under the Norges Bank Act. The Directorate of Taxes regards Bitcoin as an electronic service and not a currency and value-added tax will therefore be charged on bitcoin trading.

Increased use of electronic invoicing is today probably the primary source of improvements in cost-efficiency in the payment system. Invoicing is not a payment service, but is closely linked to credit and debit transfers. According to Norges Bank estimates, invoicing costs can be more than halved by switching to electronic invoicing, reducing invoicing costs by roughly NOK 25 billion annually, although the estimates are uncertain. An e-invoicing requirement for suppliers to government agencies will probably also boost the use of e-invoicing in the private sector.

Øystein Olsen
21 May 2014

NORGES BANK'S RESPONSIBILITY

Norges Bank oversees the financial infrastructure, including the payment system and the securities settlement system, and supervises systems for clearing and settlement of interbank money transfers (interbank systems). This is part of Norges Bank's work to promote financial stability.

Under Section 1 of the Norges Bank Act, Norges Bank is responsible for promoting an efficient payment system in Norway and vis-à-vis other countries. The payment system, as referred to in Section 1 of the Act, comprises any means, systems or instruments that can be used to execute or facilitate payment transactions. An efficient payment system completes payment transactions quickly, reliably and at low cost.

Norges Bank is responsible for promoting an efficient payment system. The Bank does this by:

- providing secure and efficient settlement of interbank payments in banks' accounts in Norges Bank,
- supplying banknotes and coins and ensuring that they function effectively as payment instruments, and
- overseeing important developments in the payment system and identifying ways to improve the system's resilience and efficiency.

Norges Bank is responsible for supervising interbank systems pursuant to Chapter 2 of the Payment Systems Act.

Norges Bank fulfils its supervisory responsibility by setting requirements for interbank systems and supervising the systems to ensure that they comply with the requirements and with the Payment Systems Act.

The payment system comprises interbank systems and systems for payment services, cf. the Payment Systems Act. **Interbank systems** are systems for interbank money transfers, with common rules for clearing and settlement. **Systems for payment services** are systems for the transfer of funds between customer accounts in banks or other undertakings authorised to provide payment services, cf. Payment Systems Act, Section 1-1. Cash payment is not defined as a payment service.

The securities settlement system (VPO) is a system for the transfer of financial instruments, with common rules for clearing and settlement. A stable and robust securities settlement system is important for a well-functioning financial market.

SUPERVISION

Norges Bank is responsible under the Payment Systems Act for authorising and supervising interbank systems (see box). DNB ASA and the Operations Office of the Norwegian Interbank Clearing System (NICS) are licensed by Norges Bank to operate interbank systems. This means that the systems are subject to the provisions of the Payment Systems Act and that Norges Bank can impose requirements on system operators.

If Norges Bank identifies a violation of the Payment Systems Act or the terms of the licence, the Bank can instruct the interbank systems that are subject to supervision to rectify the violation. Norges Bank can grant exemption from the licensing requirement for interbank systems that are considered too small to have a significant effect on financial stability. In Norges Bank's assessment, the SpareBank 1 SMN settlement system is not sufficiently important to financial stability to warrant a licensing requirement, but it is subject to oversight. The DNB ASA settlement system, on the other hand, is subject to supervision (see paragraph above). The licensing requirement for interbank systems in the Payment Systems Act does not apply to Norges Bank's settlement system.

OVERSIGHT

Norges Bank's oversight responsibilities are based on Section 1 of the Norges Bank Act and international principles drawn up by the Committee on Payment and Settlement Systems (CPSS) and the International Organization of Securities Commissions (IOSCO). Norges Bank is not a member of the CPSS. Finanstilsynet (Financial Supervisory Authority of Norway) is a member of IOSCO.

Norges Bank oversees the Norwegian securities settlement system (VPO), including the central counter-

TABLE 1.1: FINANCIAL MARKET INFRASTRUCTURES SUBJECT TO SUPERVISION OR OVERSIGHT¹

System	Instrument	Operator	Supervision/oversight	Administrative body
Norwegian securities settlement system (VPO)	Securities	VPS (Norwegian CSD)	Supervision and oversight	Supervision of VPS and VPO: Finanstilsynet Oversight of VPO: Norges Bank
Oslo Clearing settlement system(OCO)	Financial instruments	Oslo Clearing ASA (OC)	Supervision and oversight	Supervision of OC and OCO: Finanstilsynet Oversight of OCO: Norges Bank
Norwegian Interbank Clearing System (NICS)	Payments	NICS Operations Office	Supervision and oversight	Norges Bank
Norges Bank's settlement system (NBO)	Payments	Norges Bank	Oversight	Norges Bank
DNB Bank ASA settlement system	Payments	DNB Bank ASA	Supervision and oversight	Norges Bank
SpareBank 1 SMN settlement system	Payments	SpareBank 1 SMN	Oversight	Norges Bank
Continuous Linked Settlement (CLS)	Foreign exchange	CLS Bank	Supervision and oversight	Supervision of CLS: Federal Reserve Oversight of CLS: Central banks with currencies settled in CLS, including Norges Bank

¹ Efforts are in progress to establish cooperation between the UK and the Norwegian authorities on oversight and supervision of LCH.

party (CCP)¹ Oslo Clearing and the Bank's own settlement system (NBO), which settles the cash leg of securities transactions. Efforts are in progress to establish cooperation between the UK and the Norwegian authorities on the oversight and supervision of the CCP LCH.Clearnet (LCH). Norges Bank also oversees NICS and the DNB ASA and SpareBank 1 SMN private settlement systems. NICS and the DNB ASA settlement system are thus subject to both oversight and supervision by Norges Bank, while the other systems are only subject to oversight.

Norges Bank is also a member of the international oversight group for US Continuous Linked Settlement (CLS), an international bank for the settlement of foreign exchange trades.

Robust and efficient settlement is important in maintaining market participants' confidence that transactions in money and financial instruments will be completed in a sound manner. If Norges Bank through its oversight of the systems identifies shortcomings that could compromise safety or efficiency, Norges Bank will encourage the systems to rectify the shortcomings. Norges Bank's assessments are published in this *Report*.

COOPERATION WITH FINANSTILSYNET

As Finanstilsynet's supervisory tasks and Norges Bank's supervisory and oversight responsibilities in the financial infrastructure overlap, the two institutions work in close collaboration.

¹ The role of the CCP is to enter the trade as a party or in some other way guarantee that obligations relating to trades in and borrowing of financial instruments are fulfilled.

Finanstilsynet has the primary responsibility for supervising systems for retail payment services, including supervising the technical operation of these systems. Norges Bank is responsible for promoting an efficient payment system in Norway and vis-à-vis other countries. This means that Norges Bank also assesses the efficiency of retail payment services.

Norges Bank is responsible for supervising interbank systems, while Finanstilsynet can impose requirements with regard to the system's technical operation. Norges Bank builds on Finanstilsynet's assessment of technical systems in its supervision of interbank systems and Finanstilsynet may take part in supervisory meetings as an observer.

The Norwegian Central Securities Depository (VPS) and Oslo Clearing are licensed by the Ministry of Finance. Finanstilsynet has supervisory responsibility and takes part as an observer in the oversight meetings conducted by Norges Bank. Table 1.1 provides an overview of responsibility for supervision and oversight of the various systems.

Finanstilsynet and Norges Bank are in regular contact, and the two institutions exchange information and consult each other before important decisions affecting the payment system or the settlement system are made. The collaboration between Finanstilsynet and Norges Bank is described in more detail on Norges Bank's website.²

² Norges Bank (2011).

1 INTERBANK SYSTEMS AND SECURITIES SETTLEMENT SYSTEMS

1.1 THE NORWEGIAN FINANCIAL INFRASTRUCTURE

The financial infrastructure comprises systems that facilitate the clearing, settlement, and recording of monetary and other financial transactions. The payment system and securities settlement system, including central counterparty systems, are important components of the Norwegian financial infrastructure. Retail payment systems are not included here.

THE NORWEGIAN INTERBANK SYSTEM

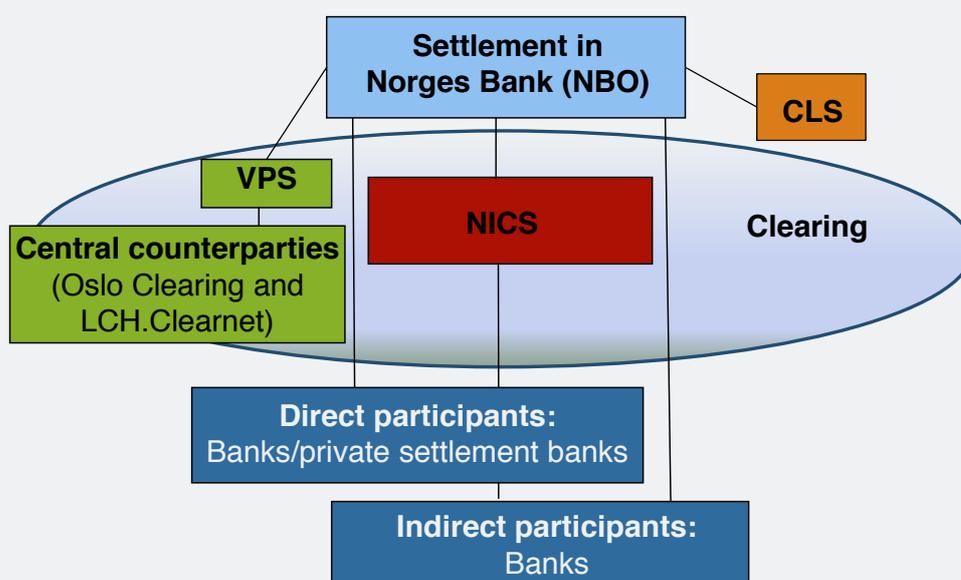
Norges Bank is the ultimate settlement bank in Norway (see Chart 1.1). Norges Bank's settlement system (NBO) receives clearings from the Norwegian Interbank Clearing System (NICS), the Norwegian central securities depository (VPS) and Oslo Clearing. The system also receives payments from Norwegian banks and payments sent to and from the Continuous Linked Settlement system (CLS).

NICS relays payments for gross or net settlement in Norges Bank. Small-value payments, such as card and credit and debit transfers, are netted, leaving each bank with a total net credit or debit position vis-à-vis

the other participant banks. The positions calculated by NICS are then sent to NBO for settlement. In NBO, banks' accounts are credited or debited to settle these positions, i.e. net settlement. If all the banks have sufficient cover in their accounts with Norges Bank, settlement is concluded a few minutes after NBO has received the clearing result from NICS. After settlement, the transactions (so-called accounting data) are returned to the banks via NICS to be entered as credits or debits in bank customer accounts. Transactions not included in the clearing are also sent to NICS for settlement at Norges Bank. These transactions are settled one by one, i.e. gross transactions.

Most large Norwegian banks and the two private settlement banks are directly involved in net settlement in NBO (first-tier banks). For those banks whose positions are settled through a private settlement bank (second-tier), the private settlement bank takes over these banks' positions and settles on their behalf in NBO. Banks using a private settlement bank in the net settlement can also choose to send gross transactions directly to NBO for settlement. For banks with first-tier settlement, transactions exceeding NOK 25m are automatically relayed as gross transactions from

CHART1.1 Interbank and securities settlement systems in Norway¹



¹ The chart has been simplified for clarity
Source: Norges Bank

NICS directly to NBO for settlement. Payments of less than NOK 25m can also be sent as gross transactions, in which case they must be specially marked.

Banks can cover their debit positions in the settlement by drawing down deposits or raising intraday loans (D-loans) against collateral in Norges Bank. Banks participating through a private settlement bank can draw down their credit lines in the settlement bank.

Foreign exchange trades involving NOK are largely settled in CLS Bank. Each foreign exchange trade is settled gross in the banks' accounts with CLS. Payments to and from CLS in NOK are settled directly in NBO. A settlement participant in CLS can pay in the amount directly or via a correspondent bank.

THE NORWEGIAN SECURITIES SETTLEMENT SYSTEM

The securities settlement system (VPS) settles trades in cash and securities. Norges Bank carries out cash settlement and rights in securities are recorded in VPS.

For settlement of trades in equity capital instruments at Oslo Børs, these trades are first reported to Oslo Clearing and/or LCH. Clearnet (LCH), which are central counterparties for trading in equity capital instruments at Oslo Børs. Oslo Clearing and LCH submit cleared cash and equity capital instrument positions to VPS. Trades in bonds and short-term paper are sent directly to VPS by investment firms.

VPS then calculates a securities position and a cash position (i.e. the cash or securities each participant owes or is owed). A net cash position and a net position for each security are calculated for all participants. Securities to be settled are reserved on the seller's securities account in VPS. On the basis of the VPS clearing, the cash leg is settled at Norges Bank and the settlement transactions are then recorded by VPS. VPS ensures Delivery versus Payment (DvP) so that ownership of the securities is only transferred if the buyer can deliver payment and the seller can deliver the securities.

Participation in the securities leg of settlement in VPS can be direct or indirect. Indirect participation means that the indirect participant's position is netted against the direct participant's positions. The direct participant then conducts the settlement on behalf of the indirect participant. If a direct participant in securities settlement does not have an account in Norges Bank, the settlement must be conducted by

a bank with an account in Norges Bank (a liquidity bank). Investment firms are often direct participants in the VPS settlement and indirect participants in the cash leg of settlement at Norges Bank.

There are three central counterparties authorised to operate in Norway: Oslo Clearing, LCH and Nasdaq OMX Clearing through the Nasdaq OMX Oslo branch. Both Oslo Clearing and LCH are central counterparties in equity capital instrument trading at Oslo Børs. Oslo Clearing is also a central counterparty for trading in derivatives with equities and equity indices as underlying instruments and securities lending.³ Oslo Clearing sends cash positions directly to Norges Bank for settlement. Nasdaq OMX Oslo provides clearing for goods and energy derivatives. Settlement is primarily in EUR and USD and positions are settled in private banks.

1.2 INTERBANK SYSTEMS

1.2.1 THE NORWEGIAN INTERBANK CLEARING SYSTEM

The Norwegian Interbank Clearing System (NICS) is the banks' joint system for receiving and clearing payment transactions. In Norway, nearly all payment transactions are sent to NICS before being relayed to Norges Bank for settlement in Norges Bank's settlement system (NBO).

The NICS Operations Office is authorised by Norges Bank as the operator of NICS. The NICS Operations Office has outsourced the operation of NICS to Nets Norge Infrastruktur AS, which is wholly owned by Nets Norway AS, which in turn is owned by the Danish holding company Nets Holding A/S. The NICS Operations Office has ultimate responsibility for the operation of NICS.

Most transactions received by NICS are included in a multilateral clearing in which each bank's position against other banks has been calculated. The clearing result is sent to Norges Bank for settlement. Settlements at Norges Bank take place at 05.30 am, 11.00 am, 1.30 pm and 3.30 pm.

Large transactions sent by banks to NICS are relayed directly one by one to NBO for settlement. These transactions are settled as they are received. Although

³ VPS participants with insufficient cover for the sale of equities can borrow equities through a facility where Oslo Clearing is a central counterparty.

there are only a few of these transactions, gross settlement (NICS Gross) is by far the largest in value terms (see Chart 2.1).

Operational stability of NICS

As virtually all payments in Norway pass through NICS, operational stability is of paramount importance. Operational stability is measured by recording all disruptions and assigning error points according to level of severity. The number of disruptions and error points is low and has decreased considerably since system start-up in 1998 (see Chart 2.2). One major disruption occurred in 2013: On 18 March communication between NICS and the banks was disrupted for almost three hours as a result of severe network problems. In February 2014 there were two major disruptions, on 4 and on 6 February. On both occasions the connection between NICS and SWIFT⁴ was lost, leading to a halt in the receipt and processing of SWIFT transactions. The disruption lasted for over an hour on 4 February and a little more than two hours on 6 February.

The NICS Operations Office conducts testing to ensure the operational stability of NICS in the event of disruptions. NICS is operated at two different locations. If one location encounters problems, all operations are transferred to the other location. A test is conducted every year where one of the locations is

put out of operation. In the tests that have been conducted, NICS maintained normal operations.

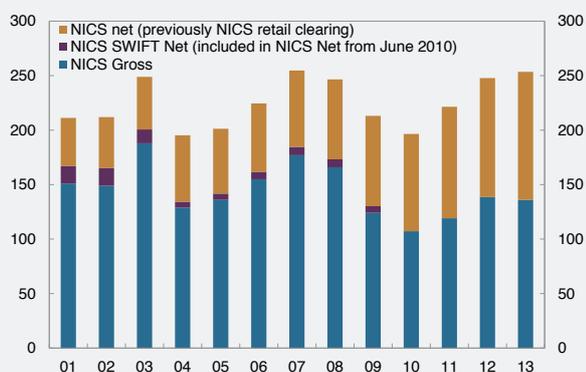
The NICS Operations Office has also introduced measures to maintain the exchange of transactions, clearing and settlement in general if the participants should encounter difficulties. One of these measures is arrangements to allow a change of settlement bank if a private settlement bank is no longer able to conduct settlement. Tests conducted in autumn 2013 show that these arrangements are effective.

A critical factor in the event of a disruption is whether participants are able to manage the situation in a sound manner. To contribute to sound management of disruption situations, the NICS Operations Office has introduced self-certification and self-declaration for banks participating in NICS. The Operations Office revised the self-certification and self-declaration forms in 2013. The most important changes involve greater emphasis on notification procedures in the event of a disruption and procedures in connection with system changes.

Norges Bank finds that the NICS Operations Office takes relevant and useful initiatives to ensure the operational stability of NICS. The self-certification arrangement provides a sound basis for banks to successfully manage disruption situations. Norges Bank also welcomes the tests conducted by the NICS

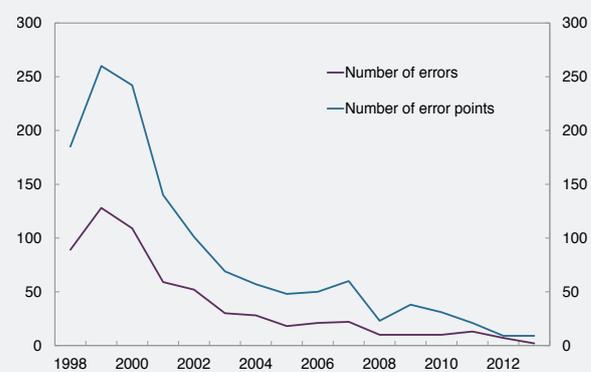
4 An international messaging and communications network offering a range of standardised messaging formats for the exchange of payment information.

CHART 2.1 Daily average turnover in NICS. In billions of NOK. 2002-2013



Source: NICS Operations Office

CHART 2.2 Disruptions in NICS operations. Number of errors and error points¹. 1998-2013



1 Error points indicate error severity level

Source: NICS Operations Office

Operations Office, which show that the established solutions for the management of disruptions function as intended.

Norges Bank conducts regular semi-annual supervisory meetings about NICS with the system owner, the NICS Operations Office. Additional meetings have been held on specific themes, such as the evaluation of NICS against the CPSS-IOSCO principles (2012), contingency plans and the new service agreement with Nets Norge Infrastruktur AS.

Sale of Nets

Key components of the Norwegian payment system are operated by the Nets Group, such as NICS and central components of BankAxept and BankID. The holding company Nets Holding A/S is Danish and is today owned by Danish and Norwegian banks and Danmarks Nationalbank. On 24 March 2014, the owners agreed to sell the company to Advent International, ATP and Bain Capital. The sale requires the approval of the Danish authorities. The Ministry of Finance set the conditions for the fusion that created Nets in 2010 and can ensure that these conditions are not breached.

On 12 December 2012, the NICS Operations Office submitted a change notification to Norges Bank concerning a planned merger of Nets Norway AS and Nets Denmark A/S to create a new company, Nets A/S, registered in Denmark (see Norges Bank (2013a) for further details). The creation of the new branch has not been completed. Finanstilsynet (Financial Supervisory Authority of Norway) and Norges Bank have highlighted the need for a clarification of bank ownership and user rights to the solutions used in banks' joint payment services and joint infrastructure. Such a clarification is particularly important if Nets is converted into a branch. Sound management and supervision of the joint infrastructure are essential, particularly in a contingency situation.

On 28 March 2014, Norges Bank received the change notification from NICS Operations Office concerning a new service agreement between the NICS Operations Office and Nets Norge Infrastruktur. In its response to this notification, Norges Bank will focus on whether the agreement entails an improvement in the above conditions. Norges Bank may require changes in the agreement.

1.2.2 NORGES BANK'S SETTLEMENT SYSTEM

Norges Bank is the ultimate settlement bank in Norway and interbank positions are settled on a gross or net basis in Norges Bank's settlement system (NBO). The 22 largest banks participate directly in settlements of daily clearings from NICS, while the remaining 106 banks participate via a private settlement bank.

Operation of NBO has been stable, especially since the new settlement system was introduced in April 2009. System availability for NBO was 100% in 2013. For NBO Online, which gives banks access to account information, system availability was 99.89%. For the SIL system, which registers securities pledged by banks as collateral for loans, system availability was 99.95%.

Daily turnover in NBO averaged NOK 203bn⁵ in 2013. On half of the days, turnover was between NOK 161bn and NOK 224bn, while the highest turnover on one day was NOK 567bn (see Chart 2.3). Gross settlements account for most of the turnover (see Chart 2.4) and most gross settlements are completed in the 1.30 pm settlement (see Chart 2.5). The share of turnover at the end of the day is somewhat higher compared with the period before the financial crisis.

Banks total deposits and unutilised borrowing facilities averaged NOK 278bn in 2013 (see Chart 2.6), which is a high level compared with turnover in NBO. The size of the borrowing facility varies across banks, but Chart 2.7 shows that all the banks generally have ample liquidity and unutilised borrowing facilities through the day to meet their payment obligations in the NBO settlements.

Even though most banks have an account at Norges Bank, a few banks account for most of the turnover. On average, the ten largest banks accounted for 94% of turnover in 2013 and engage in transactions with many other banks. These banks not only have most customers and extensive proprietary trading, they also offer other banks indirect participation in various types of infrastructure (see box on page 12).

Contingency arrangements in NBO

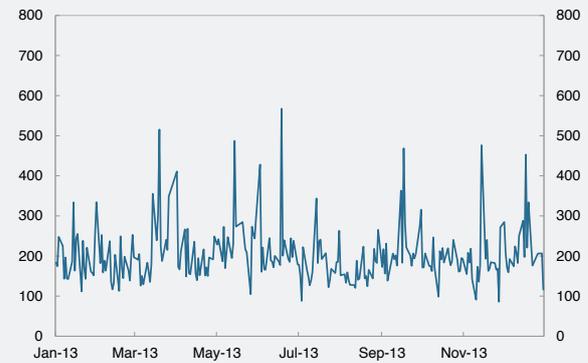
Even short-lived disruptions in NBO would have substantial consequences for banks. To increase robustness and efficiency in the banking sector, new contingency solutions have been established for NBO.

5 Including the liaison account in the net settlement.

The facilities have been put in place to enable Norges Bank to replace key functions in NBO in the event of severe operational failures or disruptions. Norges Bank and the banks have also established contingency arrangements for electronic communication systems related to settlement. These measures reduce the potential consequences of severe disruptions in NBO.

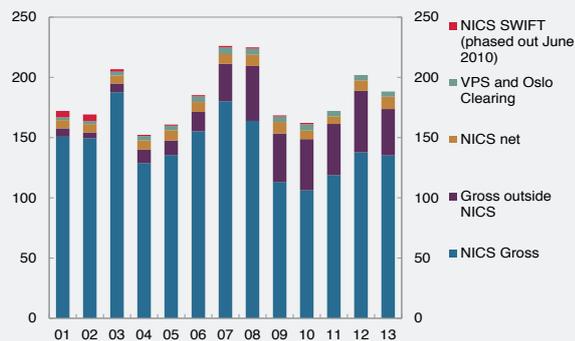
Contingency preparedness in NBO is also strengthened by the many crisis management exercises that are conducted every year. The exercises involve the settlement system, the SIL system and Norges Bank's account management for the government. Some of

CHART 2.3 Daily turnover in NBO in 2013. In billions of NOK



Source: Norges Bank

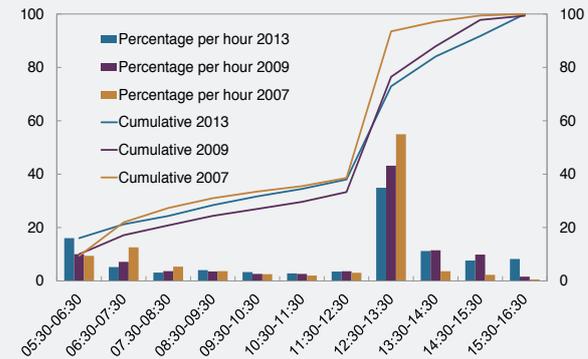
CHART 2.4 Average daily turnover in NBO by settlement. In billions of NOK. 2001-2013¹



¹ Break in series in 2009

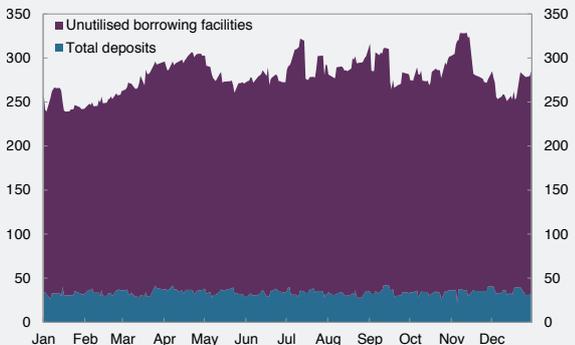
Source: Norges Bank

CHART 2.5 Gross settlements through the day. Daily average. Percentage of total gross settlement value



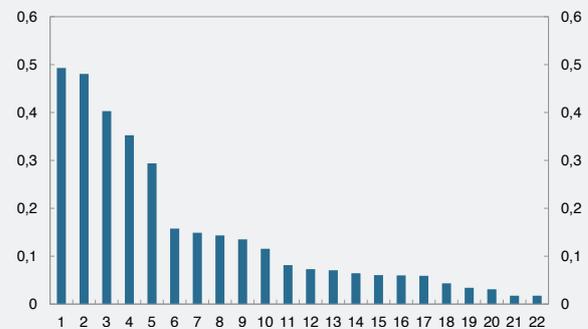
Source: Norges Bank

CHART 2.6 Banks' total deposits and unutilised borrowing facilities at Norges Bank (end of day). In billions of NOK. 2013



Source: Norges Bank

CHART 2.7 Liquidity fraction¹. 2013



¹ Maximum liquidity needs during a single day for a bank in NBO relative to the bank's available liquidity in NBO. Normal transaction order. Average for banks with direct settlement in NBO

Source: Norges Bank

SYSTEM STABILITY DEPENDS ON THE PARTICIPANTS

Financial market infrastructures (FMIs) are important in ensuring the efficient and stable settlement of transactions for households and enterprises. FMIs are systemically important payment systems, central securities depositories, securities settlement systems, and systems for central counterparties and trade repositories (of which there are none in Norway). The efficiency and stability of FMIs depends on how they are designed and operated, but also on the stability of their largest participants. These participants, which are often large banks, account for most of an FMI's turnover, and other institutions (including banks) participate in FMIs through these large banks.

The failure of a large bank can have consequences for settlements in an FMI for two reasons. First, large banks account for a substantial portion of the turnover in an FMI. If a large bank fails, the settlement of many transactions in an FMI may be postponed or cancelled. Second, smaller banks often participate in FMIs through large banks. The failure of a large bank can therefore affect smaller participants, preventing them from participating in FMI settlements.

It is important to identify banks that can affect the stability of FMI settlements and operations. Measures should be implemented to limit the risk and consequences of a failure in such banks. Furthermore, Norges Bank considers it important to ensure efficient and secure access to FMI settlements for smaller banks. Norges Bank has therefore drawn up six criteria for the identification of banks that are key participants in Norwegian FMIs.

Criterion 1: Risk of contagion effects

If one bank is responsible for a very large percentage of the turnover in an FMI, the bank's counterparties may

be severely affected if the bank does not meet its payment obligations. At worst, such contagion effects may result in a systemic crisis.

Criterion 2: Tiering

Banks can participate directly or indirectly in the FMI. Indirect participants are vulnerable to the default of the settlement member they use. In the event of such a default, these banks will not be able to complete their transactions unless there are procedures for migration to another settlement bank. The default will affect both the indirect participants themselves and their counterparties. The extent of the problem depends on both the total size of the banks affected and the number of banks that lose access to the FMI, as it can be more difficult to find alternative solutions if many banks are involved.

Criterion 3: Exposure to the bank

Institutions that participate in the FMI through a defaulting bank can incur losses as a result of their exposure to that bank, for example an outgoing payment the defaulting bank has received after a settlement but has not yet sent to the indirect participant. Deposits that indirect participants may have in banks through which they participate in the FMI may also be lost.

Indirect participants may also be exposed to other forms of risk if the bank they use defaults. For example, indirect participants in a CCP may be exposed to market risk if the bank through which they participate cannot meet a margin call, forcing the CCP to close out the position.

Criterion 4: Key role in the FMI

In some cases, an operator of an FMI enters into agreements with one or more participants that give these

participants a key role in relation to the FMI. There are two primary examples of participants with a key role: the first is banks that have entered into agreements to serve as liquidity providers in CLS, committed to providing liquidity when necessary to cover outgoing payments. The second is private banks that hold deposits for CCPs. In both cases, the FMI will be vulnerable if these banks default.

Criterion 5: Risk of price disturbances in the market

Some banks' positions in a market are so large that prices will be disturbed if these positions have to be realised in an illiquid market. For example, CCPs in an illiquid market may be forced to close out a bank's positions due to its inability to make margin payments.

Criterion 6: Turnover in a market is affected (through a low settlement ratio in an FMI)

If one bank accounts for a large percentage of the turnover in a market and the bank cannot meet its obligations, turnover in the FMI will decrease. For example, if a large participant cannot deliver its part of a transaction in a securities settlement, the settlement ratio may then fall, with only a small share of agreed trades settled. Other negative consequences may then arise, such as the exit of foreign investors from the Norwegian market (for example if the settlement ratio in VPO is low).

A number of the criteria are related to the negative effects of a large bank's incapacity to complete settlement of its transactions (criteria 1, 5 and 6), including transactions from indirect participants unless they can complete their transactions in some other way. If efficient procedures for migration to another bank are in place, transactions from indirect participants will not be affected.

The authorities and FMIs can implement measures to limit risk related to large participants. These measures can be grouped into three main categories:

- 1 The authorities impose requirements that reduce the probability of default for banks that have a key role in the infrastructure. In Norway, this measure has been implemented by imposing an extra capital requirement on these banks.
- 2 The authorities or the operator of the FMI encourage, and in some cases require, indirect participants to become direct participants. FMIs should also actively monitor risk if large institutions choose direct participation. Such an approach is in line with the CPSS-IOSCO principles (2012).
- 3 FMIs have rules and procedures that enable the FMI to manage the default of a key participant in an efficient manner. For example, the Norwegian payment system has established a procedure for migration to another settlement bank if a settlement bank defaults.

Even though a number of measures have been implemented to mitigate risk related to large participants in FMIs, this risk still exists, as removing it in its entirety would involve excessive costs. Norges Bank seeks to ensure that this risk remains at a satisfactory level through its supervision and oversight of FMIs.

the exercises are conducted by the international systems CLS and SWIFT, but the majority are internal or are conducted in collaboration with participants and other stakeholders in the Norwegian payment system. A total of 26 exercises were conducted in 2013.

Norges Bank welcomes the establishment of new contingency solutions both for NBO functions and for communication between NBO and banks and the extensive testing of NBO functions in 2013.

1.2.3 PRIVATE SETTLEMENT BANK SYSTEMS

There were four private settlement banks at the end of 2013. DNB is the settlement bank for 97 small banks, SpareBank 1 SMN for 11 small banks and Danske Bank and Skandinaviska Enskilda Banken are settlement banks for one bank each. The private settlement banks participate directly in the NBO settlements (first-tier banks) and settle their own positions and those of any indirect participants (second-tier banks) (see section on NICS). The use of private settlement banks reduces the number of settlement participants and thus reduces the risk of delays in the settlement process.

To mitigate the risk associated with the role of settlement bank, settlement limits (caps) were introduced for second-tier banks in September 2012. When these caps were introduced, Norges Bank required an evaluation to be carried out when the banks had had some experience of the system. Norges Bank was concerned that settlement banks should set an appropriate level for the caps that balanced the interest of mitigating risk exposure for settlement banks with that of avoiding settlement disruptions. The evaluation conducted in autumn 2013 showed that the system functions as intended.

DNB

The DNB settlement system was stable in 2013. The number of disruptions was reduced from 12 in 2012 to four in 2013. None of the disruptions was severe and there were no direct consequences for participant banks.

Norges Bank conducts semi-annual supervisory meetings about settlement bank operations with DNB. In addition, a meeting was held concerning Norges Bank's assessment of the DNB settlement system against the CPSS-IOSCO principles and contingency plans.

SpareBank 1 SMN

Norges Bank does not supervise the SpareBank 1 SMN interbank settlement system, but conducts an annual oversight meeting and evaluates the system against the CPSS-IOSCO principles. There were no disruptions or operational failures in the SpareBank 1 SMN system in 2013.

1.2.4 CONTINUOUS LINKED SETTLEMENT

CLS Bank International (CLS) is a settlement bank for foreign exchange transactions, settling trades in 17 different currencies.⁶ CLS is located in New York and is subject to supervision by the Federal Reserve.

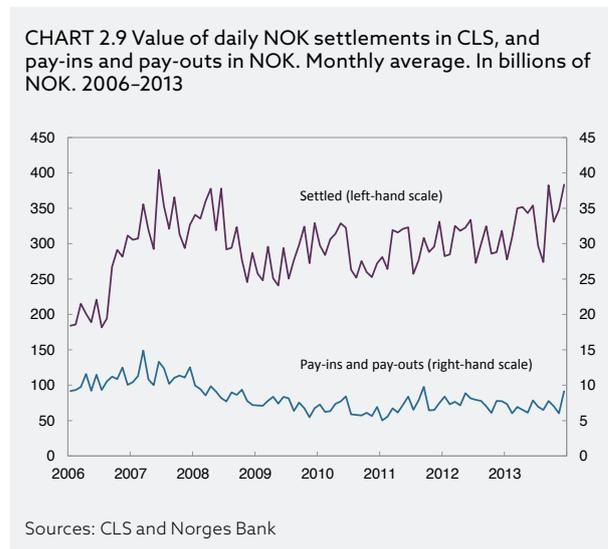
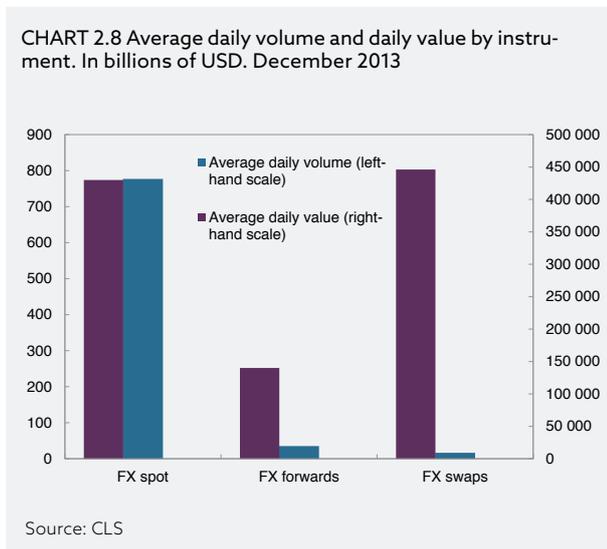
The central banks for the 16 currencies apart from the US dollar, including Norges Bank, participate in a cooperative oversight arrangement headed by the Federal Reserve.⁷ Regular oversight meetings are normally held three times a year, in addition to telephone meetings on specific issues.

Participation can be either direct (as a settlement member) or indirect (as a third party). Settlement members handle all of their own payments, while third parties make and receive payments via settlement members. All ingoing and outgoing payments in CLS are made via a central bank account in the relevant currency.

Settlement members that do not have an account at a central bank must use a bank that does have such an account (correspondent bank). There are four correspondent banks for payments in NOK: DNB, Nordea, SEB and Danske Bank. The correspondent banks pay in and receive NOK in NBO on their own behalf and on behalf of their participant banks. Handelsbanken does not participate on behalf of any other bank in NOK. There are 65 settlement members in CLS. All ingoing and outgoing payments in NOK to and from the CLS account in Norges Bank are transacted through the four correspondent banks and Handelsbanken.

6 The US dollar, euro, pound sterling, Canadian dollar, Swiss franc, Hong Kong dollar, Australian dollar, New Zealand dollar, Mexican peso, Israeli shekel, Korean won, Singapore dollar, Japanese yen, South African rand, Danish krone, Swedish krona and Norwegian krone.

7 In the US, CLS has been designated by the US Financial Stability Oversight Council as one of eight systemically important financial market institutions pursuant to the Dodd-Frank Act.



The 17 currencies covered by CLS account for 90% of all foreign exchange trading. However, only about 60% of foreign exchange trades are settled in CLS. The remaining 40% are settled bilaterally. The reason that not all trades are settled in CLS may be that the parties find bilateral settlement more suitable or that the currency or instrument is not eligible in CLS. CLS currently settles payment instructions related to foreign exchange spot trades, foreign exchange swaps and foreign exchange forwards (see Chart 2.8).

In order to increase turnover and reduce settlement risk on a global basis, CLS is actively seeking to expand their range of eligible currencies and instruments to include the Chinese yuan renminbi, the Thai baht, Brazilian real and Russian rouble (RUB). Work has progressed furthest on including the rouble, and CLS hopes to begin offering settlement in RUB from November 2014. It takes considerable time to include new currencies, particularly because a number of legal conditions must be in place before a currency can be settled in CLS. In September 2013, CLS launched same-day settlement between USD and CAD.

1.3 SECURITIES SETTLEMENT SYSTEM

Payments for trades in equities, equity capital instruments, listed funds, notes and bonds are settled in the securities settlement system (VPO). An efficient and secure infrastructure for the execution and settlement of trades is essential for the smooth functioning of securities markets. The securities market

infrastructure must meet strict requirements. VPS has a key role both as operator of VPO and as a central securities depository (CSD). Other key elements are Oslo Clearing, LCH and Norges Bank (which performs the cash leg of the securities settlement in VPO).

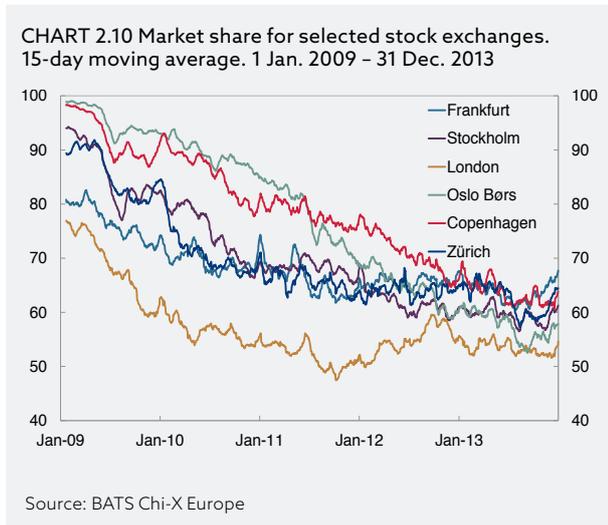
1.3.1 TRADING ON OSLO BØRS AND OTHER EXCHANGES

Activity in the settlement of trades will depend on market developments. Like exchanges in other countries, Oslo Børs has lost market share in recent years (Chart 2.10). While Oslo Børs had a market share of nearly 100% at the beginning of 2009, the share had fallen to 55% at the end of 2013. BATS CHI-X, Nasdaq OMX Nordic Stockholm and Turquoise in particular have taken market share from Oslo Børs.⁸

Equity trades on Oslo Børs declined in 2013 in terms of both volume and value. The number of equity trades per day decreased from about 85 500 in 2012 to 72 600 in 2013, while annual turnover was reduced from around NOK 1000bn in 2012 to around NOK 820bn in 2013.

In contrast to equity trades, turnover in fixed income instruments and equity derivatives on Oslo Børs increased in 2013. Fixed income trades per day increased from 82 in 2012 to 121 in 2013, and the value of annual turnover rose from about NOK 2800bn

⁸ BATS CHI-X and Turquoise are multilateral trading facilities (MTFs). An MTF is an organised marketplace controlled by banks or similar institutions cf. Chapter 11 of the Securities Trading Act.



in 2012 to NOK 3600bn in 2013. Turnover in equity derivatives listed on Oslo Børs increased from about 43 000 contracts traded per day in 2012 to about 47 000 contracts per day in 2013.

1.3.2 THE CENTRAL SECURITIES DEPOSITORY (VPS)

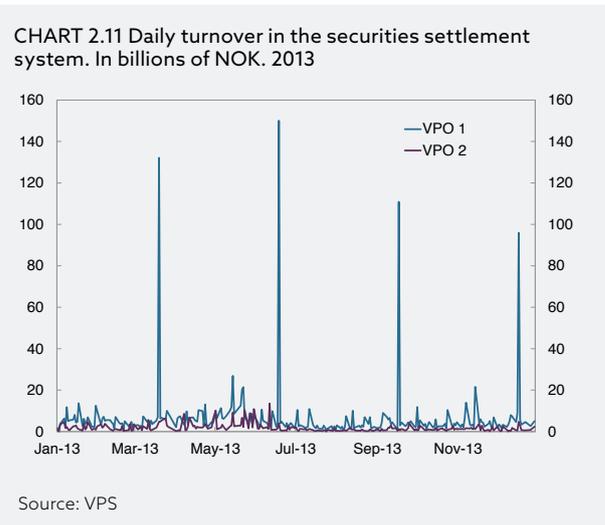
Transactions in financial instruments normally consist of a payment (the cash leg of the settlement) and a transfer of financial instruments (the securities leg of the settlement).

VPS can be said to have two functions: a static function in that owners of and holders of rights to registered financial instruments are recorded and a dynamic function when a transfer of a financial instrument is initiated and entered in the VPS accounts.

VPS and VPO are supervised by Finanstilsynet, and VPO is subject to oversight by Norges Bank. Norges Bank has two annual oversight meetings with VPS concerning VPO, with Finanstilsynet participating as observer. Several additional meetings have also been held to discuss specific issues, primarily concerning the assessment of VPS against the CPSS-IOSCO principles.

The cash leg of securities settlement takes place at Norges Bank through two daily net settlements involving 19 banks and Oslo Clearing.⁹ The settlements take place at about 6 am and about 12 noon.

⁹ LCH participates indirectly via a private bank in the settlement of the cash leg at Norges Bank.



In 2013, 79% of the daily volume of transactions was settled in the morning settlement. On average, net settlements totalled NOK 8.4bn per day in 2013, compared with NOK 7.8bn in 2012. The gross value is considerably higher. According to VPS, the total value of settlements between banks and their customers averaged more than NOK 100bn per day in 2013.

Net settlements can vary considerably in size (Chart 2.11). On rollover dates for Treasury bills in the swap arrangement¹⁰, which occur four times a year, net settlement has totalled more than NOK 150bn. The last agreements under the swap arrangement expire in 2014.

System availability for VPS was 99.94% in 2013, compared with 99.80% in 2012. There were no delays or disruptions in VPO in 2013 or 2014 Q1.

A key measure of the efficiency of a securities settlement is the percentage of trades settled on the agreed day, referred to as the settlement ratio.¹¹ Settlement of trades can fail for several reasons. For example, the parties may be unable to deliver securities or cash, or the transaction may be unmatched.

¹⁰ Under this arrangement, government securities were exchanged for covered bonds (OMF). The arrangement was introduced in 2008.

¹¹ When measuring the settlement ratio, a trade is considered settled when all the securities and the entire cash amount have been delivered. Partial deliveries, i.e. settlements where only part of the trade has been completed, are excluded from the calculation. Trades for which there is insufficient cover or that cannot be matched are postponed (placed in a queue) for up to 10 days.

REGULATORY FRAMEWORK FOR CENTRAL SECURITIES DEPOSITORIES

The T2S project and plans for the participation of VPS

To promote a single securities market in Europe, the ECB/Eurosystem¹ has established the TARGET2-Securities (T2S) project. T2S is a common IT solution that central securities depositories (CSDs) and central banks can use for settling securities trades in EUR and other European currencies. There are now 24 CSDs participating in the project, all of which, with the exception of Danish VP Securities, settle trades in EUR. The T2S is scheduled to go live in June 2015. CSDs will migrate to T2S in four waves from June 2015 to February 2017. Danish VP Securities and the Danish central bank will join T2S with settlement in DKK in 2018.

In 2012, VPS announced its intention to join T2S in 2018/2019. VPS is planning to introduce a new system for securities registration and settlement at Easter 2016 that will make VPS technically capable of participating in T2S. Like the other CSDs that will be participating in T2S, VPS intends to participate in T2S using settlement accounts, but not investor accounts.

New EU regulation for CSDs

On 24 February 2014, the European Commission published its proposal for the regulation of CSDs and measures to improve securities settlement (Central Securities Depository Regulation (CSDR)).² CSDs are not regulated at EU level today. Under this regulation, a CSD authorised in its home country will also be authorised for the EU/EEA area, referred to as the single passport. The regulation also includes rules for the imposition of cash penalties on participants that cause settlement fails with a view to improving settlement discipline. Rules concerning CSD links³ are also included

in the CSDR. CSD links allow investors and issuers to choose freely between CSDs. The aim is to stimulate competition between CSDs in different countries. T2S is based on the CSDR and provides the technical basis for satisfying the requirements in the CSDR.

The regulation also includes requirements for the maximum settlement cycle for all securities traded on exchanges and other regulated markets to be T (trade date) +2. Settlement of equities and bonds traded on Oslo Børs currently takes place three days after the trade has been executed (T+3).⁴ T+3 means that investors receive the securities in their securities settlement account three business days after the trade is executed and the sellers of the securities receive payment after three days. Oslo Børs VPS has decided to introduce T+2 on 6 October 2014, i.e. the settlement cycle will be one day shorter than today.

With few exceptions, all European countries currently offer a settlement cycle of T+3. With coordination through the T2S project, most European countries, including the Nordic countries and the UK, will be introducing T+2 on 6 October 2014 while the remaining countries will move to T+2 no later than 1 January 2015.

The CSDR is scheduled to enter into force in the EU in June 2014, after which the European Securities and Markets Authority (ESMA) is required to draft technical standards⁵ in the course of the following nine months for the EU bodies to adopt by the beginning of T2S implementation in June 2015. CSDs must then apply for authorisation to the competent authorities in their home country within six months. The authorities will then have six months to process the applications.

1 The Eurosystem includes the European Central Bank (ECB) and the central banks of states where the euro is the national means of payment.

2 This is a revised version of the first proposal, which was published in March 2012.

3 A link is a set of contact and operational arrangements linking two of more FMI's together directly or via an intermediary.

4 With the exception of short-term paper, where the settlement period is currently T+2.

5 The standards are required to be as far as possible in line with CPSS-IOSCO (2012).

According to VPS data, the settlement ratio in the Norwegian securities settlement system was 96.59% in 2013, compared with 96.13% in 2012. According to VPS, this is on a par with the settlement ratios of markets in other countries.

Contingency testing

As operator of VPO, VPS conducts regular contingency testing vis-à-vis Norges Bank and Oslo Clearing. Norges Bank and VPS test procedures for contingencies in VPO three times a year.

1.3.3 CENTRAL COUNTERPARTIES

A central counterparty (CCP) is an institution that interposes itself between counterparties to a trade, becoming the buyer to the seller and the seller to the buyer. The original contract between the two parties is replaced with two new ones: one contract between the buyer and the CCP and one between the seller and the CCP. The CCP thus assumes the counterparty risk in the trade. The role of the CCP is to enter the trade as a party or in some other way guarantee that obligations relating to trades in and borrowing of financial instruments are fulfilled. This is referred to as clearing.

As collateral for the risk it assumes, the CCP requires the participants to post margins (bank deposits and pledged securities). Margins posted are required to cover losses at a confidence level of at least 99%. The participants are also required to pay in contributions to a default fund, which covers losses that cannot be covered by the defaulter's margins.

A number of mergers and alliances have been implemented among CCPs in Norway and internationally in recent years. In Norway, all three previously Norwegian-registered CCPs were acquired by foreign companies. UK-based LCH also established itself as a CCP on Oslo Børs in March 2014. LCH is operated from the UK.

Acquisitions and mergers can result in lower costs, for example as a result of economies of scale. When several CCPs offer services in the same exchange, the market is less vulnerable to the failure of one CCP. On the other hand, competition and the establishment of links between CCPs lead to increased risk in some areas.¹² Cooperation between relevant govern-

ment authorities on supervision and oversight is therefore important.

Oslo Clearing

Oslo Clearing is a CCP on Oslo Børs for trading in equity capital instruments and derivatives with equities and equity indices as the underlying instrument. Oslo Clearing is also a CCP for some OTC derivatives¹³ and securities lending products. Oslo Clearing participates in both of the securities settlements at Norges Bank, in the derivatives settlement (at 6.40 am) and the settlement of lending products (at 12.15 am).

In 2013, Norges Bank conducted one regular supervisory meeting with Oslo Clearing, where Finanstilsynet took part as observer. In addition, the institutions have held a number of meetings to discuss specific issues, primarily to evaluate Oslo Clearing against the CPSS-IOSCO principles.

Oslo Clearing currently has 17 clearing members; 7 of the members also take part on behalf of others. Direct members of Oslo Clearing are usually large banks with an important role in the financial infrastructure. System availability for derivatives clearing was 99.91% in 2013, compared with 99.85% in 2012. System availability for clearing of equity capital instruments was 99.96% in 2013, compared with 100% in 2012.

Oslo Clearing conducts regular crisis management exercises involving VPS, Norges Bank and Oslo Børs. The exercises conducted in 2013 have resulted in some minor adjustments to Oslo Clearing's default procedures.

In the period 2011–2014, Oslo Clearing has implemented changes in the clearing system to coordinate clearing of equity capital instruments and derivatives. Oslo Clearing has also adjusted its rules as a result of changes in the regulatory framework for CCPs in Europe.

Swiss SIX x-clear has bought Oslo Clearing

On 2 May 2014, Oslo Børs VPS Holding sold Oslo Clearing to Swiss SIX x-clear, an international CCP with around 70 members. SIX x-clear provides services to

12 See for example Principle 20 in CPSS-IOSCO (2012).

13 OTC stands for Over The Counter, i.e. trading not conducted on an exchange.

the London Stock Exchange, BATS CHI-X and several other exchanges in Europe. Oslo Clearing will be a subsidiary of SIX x-clear, but is expected to become a branch later in 2014. SIX x-clear is subject to supervisions and oversight by the Swiss financial supervisory authority (FINMA) and the Swiss central bank (SNB). As long as Oslo Clearing is a subsidiary, the company will operate under its existing licence from the Ministry of Finance. Before Oslo Clearing can be converted into a branch of SIX x-clear, SIX x-clear is required to have a licence from the Ministry of Finance to operate as a CCP in Norway. The Norwegian and Swiss authorities will cooperate on the supervision and oversight of the branch.

LCH is a new CCP on Oslo Børs

From March 2014, members of Oslo Børs have been able to choose between two CCPs: UK-based LCH and Oslo Clearing. LCH is an international CCP with over 170 members. Like SIX x-clear, LCH provides services to the London Stock Exchange, BATS CHI-X and several other exchanges in Europe as well as exchanges all over the world (including the US, Switzerland, Canada, Japan, Australia and Hong Kong).

Many of the indirect members of Oslo Clearing are international banks that are LCH members. LCH's provision of services may make Oslo Børs more attractive to foreign investors.

The buyer and seller in a trade can choose different CCPs. LCH and Oslo Clearing have therefore established a link between them (see footnote 3 on page 17).

LCH has a licence from the Ministry of Finance to conduct cross-border activities in Norway. The Bank of England is responsible for supervision and oversight of LCH. Norwegian and UK authorities will cooperate on the supervision and oversight of LCH's clearing activities on Oslo Børs.

Other CCPs

Swedish Nasdaq OMX Clearing¹⁴ is a CCP for secondary listed Norwegian equity derivatives on the Stockholm stock exchange (Nasdaq OMX Stockholm). The company also holds a licence from the Ministry of Finance to operate as a CCP in Norway through its

branch Nasdaq OMX Oslo. The branch is now a CCP for energy, freight, iron ore, seafood and quota derivatives and electricity certificates. Transactions are primarily settled in EUR and USD. On 7 April 2014, NOS Clearing was merged into Nasdaq OMX Clearing. NOS operations will be conducted through Nasdaq's Norwegian branch, which is under the supervision of Finanstilsynet. Nasdaq OMX Clearing was authorised by Finanstilsynet under the Payment Systems Act in September 2013 for that portion of the company that is subject to Norwegian law. Norges Bank notified the ESA¹⁵ in October 2013, in accordance with the Payment Systems Act.

Dutch Euro CCP is a CCP for secondary listed Norwegian equities on the Stockholm stock exchange. Euro CCP also provides clearing for Burgundy, a multilateral trading facility (MTF)¹⁶ under Oslo Børs.

Norwegian banks' trades in interest rate derivatives are cleared through UK SwapClear. SwapClear is part of LCH. More than half of global transactions in interest rate derivatives are cleared by SwapClear. Interest rates derivatives are by far the largest category of OTC derivatives and are primarily used to hedge interest rate risk between a fixed and a floating interest rate. As small Norwegian banks largely obtain funding in NOK, with floating rates on both borrowing and lending, only the largest banks and mortgage companies in Norway trade in interest rate derivatives to any great extent. With the exception of the largest Norwegian banks, Norwegian banks and mortgage companies participate indirectly in SwapClear.

14 Nasdaq OMX Clearing was until 3 September 2013 part of Nasdaq OMX Stockholm.

15 EFTA Surveillance Authority.

16 See footnote 8.

TRADE REPOSITORIES

In the light of experience gained during the financial crisis, the G20 leaders agreed on measures to mitigate risk and increase transparency in OTC derivatives markets in 2009. In response to this and other measures, the EU adopted the EMIR Regulation on 4 July 2012.¹ The Regulation requires derivatives transactions to be reported to a trade repository. The reporting requirement applies to all derivatives irrespective of whether they are traded on a regulated market or not. Both financial and non-financial counterparties must report all derivatives contracts entered into and any changes in and maturities of the contracts on the following business day at the latest.

Trade repositories shall regularly publish aggregate positions by class of derivatives and give supervisory bodies and central banks access to the information they need to fulfil their supervisory and oversight responsibilities.

Trade repositories must apply for registration by ESMA, which will also be responsible for supervision. ESMA approved six applications for registration in November 2013. The six trade repositories registered are: ICE TVEL (ICE Trade Vault Europe Ltd), CME TR (CME Trade Repository Ltd), DDRL and UnaVista (all established in the UK), KDPW (Poland) and Regis-TR (Luxembourg).

The reporting requirements apply to all new contracts and contracts entered into on or after 16 August 2012 and that were still outstanding on 12 February 2014.

Trade repositories for derivatives have a different role from central securities depositories. The latter supports a legal framework for securities transactions to protect the interest of the parties, while a trade repository for

derivatives is "only" for information and statistical purposes. The aim is to increase the transparency of derivative markets for the benefit of the general public and the authorities. On the other hand, the registration requirement and other requirements in EMIR may make it more expensive to enter into derivatives contracts. The repositories will charge for their services and market participants will have to adapt their IT systems and expend resources on reporting or paying a third party to report on their behalf.

Although Norwegian market participants are not required to report derivative transactions to a repository until EMIR has been incorporated into Norwegian law, they will nonetheless experience indirect effects of EMIR. All derivatives transactions Norwegian market participants enter into with counterparties from EU countries will be reported to trade repositories by the counterparties. Information about the derivative positions of Norwegian market participants will thus be registered in trade repositories when they enter into contracts with counterparties in the EU. Norwegian financial institutions can offer to report transactions to a trade repository on behalf of their EU clients.

EU counterparties must receive the information they need from their Norwegian counterparts in order to be able to report in the correct manner.² If Norwegian market participants wish to follow the same practices as their counterparts in the EU, they can report voluntarily. Norges Bank has been informed that some Norwegian market participants report to trade repositories at the request of their EU counterparties.

¹ Regulation (EU) 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories. (See Norges Bank (2013a) p. 39 for more details).

² Including a requirement to report an identifying code for legal entities, called a "Legal Entity Identifier" (LEI). This is regulated in Commission Implementing Regulation (EU) No. 1247/2012.

2 ASSESSMENT OF NORWEGIAN SYSTEMS AGAINST INTERNATIONAL PRINCIPLES

2.1 PRINCIPLES FOR INFRASTRUCTURE OVERSIGHT

The Committee on Payment and Settlement Systems and the Technical Committee of the International Organization of Securities Commissions (CPSS-IOSCO (2012)) have developed 24 principles for financial market infrastructures (FMIs).¹⁷ The principles are briefly explained in the box on page 23. The objective of the principles is to ensure that FMIs are robust and efficient, and promote financial stability. If FMIs are not robust and efficient, risk may spread among market participants. In the worst-case scenario, the market may collapse.

Certain principles, such as the principles of legal risk, operational risk and governance, apply to all types of FMIs. Others apply only to certain types of FMIs. For example, the principle of credit risk only applies to FMIs that assume credit risk. Each principle includes several key considerations. Generally speaking, FMIs must fulfil all of the key considerations under the principles applicable to them (see Table 2.1).

In spring 2012, Norges Bank asked the operators of NBO, NICS, Oslo Clearing and VPO, as well as the operators of the interbank systems of DNB and SpareBank 1 SMN, to conduct a self-assessment against the CPSS-IOSCO principles by the end of 2013. The systems assessed below are systemically important payment systems, securities registers, securities settlement systems and systems owned by central counterparties (FMIs). The Norwegian Central Securities Depository (VPS) is both the operator of VPO and a securities register, and its response therefore covers the principles applicable to two types of FMI. Norges Bank has assessed the securities register function separately. All of the FMIs submitted assessments to Norges Bank.

Based on the self-assessments and other information, Norges Bank conducted its own assessments, which are included in this *Report*. The assessments of the VPS and Oslo Clearing systems were prepared in cooperation with Finanstilsynet (Financial Supervisory Authority of Norway). The systems were assessed as

at February 2014.¹⁸ Norges Bank published a similar assessment of three of the systems in 2007.¹⁹

The settlement systems of DNB and SpareBank 1 SMN are so-called "quasi-systems"²⁰. They resemble FMIs, but operate accounts for other banks. Nevertheless, given their role in the settlement system, Norges Bank has chosen to assess them against the FMI principles. In these quasi-system assessments, account has been taken of the fact that not all principles are fully applicable to quasi-systems.

Norges Bank's own settlement system has also been assessed. The unit responsible for oversight is organisationally separate from the unit that manages NBO (Norges Bank's settlement system).

Rating scale

The assessment of the systems results in a rating reflecting how well a given system observes each principle. The ratings are based on the criteria defined by CPSS-IOSCO:

- Observed: the FMI observes the principle. Any shortcomings are minor and not issues of concern.
- Broadly observed: the FMI broadly observes the principle. The system has one or more deficiencies that give reason for concern. The FMI should follow up and rectify the shortcomings by a specified date.
- Partly observed: the FMI partially observes the principle. The system has one or more deficiencies that could become serious if not addressed in a timely manner. The FMI must give high priority to addressing the issue.
- Not observed: the FMI does not observe the principle. The system has one or more serious deficiencies that warrant immediate action.
- Not applicable: the principle is not applicable.

17 See also Norges Bank (2013a).

18 An exception is that no deduction is made from an FMI's score for a deficient emergency and wind-down plan, even though the principles require such a plan. However, this is conditional upon the FMI having committed to developing such a plan in accordance with the CPSS-IOSCO guidelines by a specified deadline.

19 Norges Bank (2007).

20 A commercial institution that is responsible for clearing and settlement of payments on behalf of other institutions and accounts for a material proportion of such payments. (See CPSS (2005), page 20.)

CRITERIA APPLICABLE TO SYSTEMS SUBJECT TO OVERSIGHT

CPPS-IOSCO (2012) provides that the relevant authorities should define and publish the criteria used to identify FMIs subject to regulation, supervision and oversight.

In accordance with the principles, Norges Bank has emphasised system function when identifying FMIs that should be subject to oversight.

In Norges Bank's view, financial market infrastructures that can contribute to maintaining and promoting financial stability should operate in accordance with the principles. These FMIs facilitate services that are vital to a well-functioning financial system.

In order to select which FMIs should be subject to oversight, Norges Bank has given emphasis to:

- the number of completed transactions, and the value of the FMI's transactions
- type of participant
- markets impacted by the system
- market share
- interconnectedness with other FMIs and financial institutions
- available alternatives to using the FMI at short notice.

PRINCIPLES FROM CPSS-IOSCO

CPSS-IOSCO has published 24 principles for financial market infrastructures (FMIs). FMIs are systemically important payment systems, securities settlement systems, central securities depositories, central counterparties and trade repositories. Some of the principles are applicable to all types of FMIs, while most of the principles are only relevant for some FMIs. Table 2.1 shows the applicability of principles to the specific types of FMIs that have been assessed.

Issues covered by the principles include financial risk, participant default rules and organisation. Each principle contains several key considerations. In order to observe one principle, these key considerations should normally be fulfilled. An overview of the principles is listed below:¹

- 1 Legal basis:** An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.
- 2 Governance:** An FMI should have governance arrangements that are clear and transparent and promote the safety and efficiency of the FMI. The governance arrangements should support financial stability, other relevant public interest considerations, and the objectives of relevant stakeholders.
- 3 Framework for the comprehensive management of risks:** An FMI should have a sound risk management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.
- 4 Credit risk:** An FMI should measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes.
- 5 Collateral:** An FMI that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.
- 6 Margin:** A CCP should cover its credit exposures to its participants for all products through an effective margin system that is risk-based and regularly reviewed.
- 7 Liquidity risk:** An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios. The scenarios should include, but not be limited to, the default of the participant that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.
- 8 Settlement finality:** An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.
- 9 Money settlement:** An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.
- 10 Physical deliveries:** An FMI should clearly state its obligations with respect to the physical deliveries and should identify, monitor, and manage the associated risks.

¹ Cf Bakke, Husevåg and Igland (2013) and CPSS-IOSCO (2012).

- 11 **Central securities depositories (CSDs):** A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues. Legal rights to securities should be posted electronically on CSD accounts. Alternatively, securities in paper form may be deposited for safekeeping. CSD should minimise and manage the associated risks.
- 12 **Exchange-of-value settlement systems:** FMIs sometimes settle transactions that involve the settlement of two linked obligations. Settlement of one obligation should take place if, and only if, the associated liability is settled. This is called "delivery versus delivery" in foreign exchange settlement and "delivery versus payment" in securities settlement.
- 13 **Participant-default rules and procedures:** An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.
- 14 **Segregation and portability:** This principle concerns the protection of CCP members' customers. In the case of a member default, the member's customers should be able to move their positions and the relevant collateral to an account in another institution.
- 15 **General business risk:** An FMI should identify, monitor, and manage its general business risk. The FMI should hold sufficient liquid assets to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise.
- 16 **Custody and investment risks:** An FMI should safeguard its own and its participants' assets and minimise the risk of loss on and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.
- 17 **Operational risk:** An FMI should identify the plausible sources of operational risk and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Contingency arrangements should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.
- 18 **Access and participation requirements:** An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.
- 19 **Tiered participation arrangements:** An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.
- 20 **FMI links:** An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.
- 21 **Efficiency and effectiveness:** An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.
- 22 **Communication procedures and standards:** An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards for communication.

23 Disclosure of rules, key procedures, and market data: An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other costs. All relevant rules and key procedures should be publicly disclosed.

24 Disclosure of market data by trade repositories: A trade repository should provide timely and accurate data to relevant authorities and the public in line with their respective needs.

TABLE 2.1. OVERVIEW OF THE SYSTEMS AGAINST THE PRINCIPLES¹

Principle / type of FMI	NBO	NICS	Oslo Clearing settlement system	VPO	VPS registry function
1. Legal basis	Observed	Observed	Observed	Broadly observed	Observed
2. Governance	Observed	Broadly observed	Broadly observed	Observed	Observed
3. Framework for the comprehensive management of risks	Observed	Partly observed	Observed	Observed	Observed
4. Credit risk	Observed	Not applicable	Broadly observed	Observed	Not applicable
5. Collateral	Observed	Not applicable	Observed	Not applicable	Not applicable
6. Margin	Not applicable	Not applicable	Observed	Not applicable	Not applicable
7. Liquidity risk	Observed	Observed	Observed	Observed	Not applicable
8. Settlement finality	Observed	Observed	Observed	Observed	Not applicable
9. Money settlement	Observed	Observed	Observed	Observed	Not applicable
10. Physical deliveries	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
11. Central securities depositories	Not applicable	Not applicable	Not applicable	Not applicable	Observed
12. EoV settlement systems	Observed	Not applicable	Not applicable	Observed	Not applicable
13. Default procedures	Broadly observed	Observed	Observed	Broadly observed	Observed
14. Segregation and portability	Not applicable	Not applicable	Observed	Not applicable	Not applicable
15. General business risk	Observed	Observed	Observed	Observed	Observed
16. Custody and investment risk	Not applicable	Not applicable	Observed	Observed	Observed
17. Operational risk	Broadly observed	Broadly observed	Observed	Observed	Observed
18. Access requirements	Observed	Observed	Observed	Observed	Observed
19. Tiered participation	Observed	Not applicable	Broadly observed	Broadly observed	Observed
20. FMI links	Not applicable	Not applicable	Observed	Observed	Broadly observed
21. Efficiency and effectiveness	Observed	Observed	Observed	Observed	Observed
22. Communication	Observed	Observed	Observed	Observed	Observed
23. Disclosure of information	Observed	Observed	Observed	Observed	Observed
24. Trade repositories	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Observed Broadly observed Partly observed Not observed Not applicable

¹ CPSS – IOSCO (2012) page 14 depicts the applicability of the principles to each type of FMI. Although NICS is defined as a clearing system, it is not exposed to financial risk and is therefore not assessed against the principles concerning credit risk and collateral.

Norges Bank's findings indicate that Norwegian FMIs observe the principles either fully or largely (see Table 2.1). This shows that the FMIs can generally be considered safe and efficient, even though some improvements are required.

The *Report* discusses below principles that are either not fully observed or are observed subject to certain shortcomings. In some cases, the reasons why certain principles are not applicable are also specified.

Since positive features are not discussed here, the assessments may create the impression that the FMIs are less robust than is in fact the case. Norges Bank has not identified any issues in the operations of the FMIs assessed to suggest that risk levels are too high.

Norges Bank (and Finanstilsynet in the assessments concerning the VPO, VPS's register function and Oslo Clearing's settlement system) has in some cases assigned a different rating from the one the FMI has assigned itself. In these cases, both the FMI's own rating and the rating assigned by Norges Bank are specified.

2.2 THE NORWEGIAN INTERBANK CLEARING SYSTEM

NICS was assessed against 13 of the 24 principles. Norges Bank found 10 of the principles to be observed. Two principles were deemed broadly observed and one principle was concluded to be partly observed.

Norges Bank considers NICS a well-run, robust system.

Principle 2: Governance

An FMI should have governance arrangements that are clear and transparent and promote the robustness and efficiency of the FMI. Although the NICS Operations Office has a sound, robust governance framework in place, it does not, in Norges Bank's view, meet all of the considerations in the principle. NICS does not have independent board members, since all members of the board are employed in the banking sector. The NICS Operations Office has procedures in place relating to the composition of the board, but these do not fulfil all of the requirements contained in Principle 2. Further, the NICS Operations Office has

not adopted procedures for assessing the work of each individual board member. **The NICS Operations Office considers the principle observed. Norges Bank considers the principle broadly observed.**

Principle 3: Framework for the comprehensive management of risks

An FMI should have a sound framework for managing legal, financial and operational risk. Norges Bank considers that the operator Nets Norge Infrastruktur has a satisfactory risk management framework, but that this framework does not document the role of the NICS Operations Office in risk management. The NICS Operations Office's risk management framework does not clarify who is responsible for the various processes, who performs which risk management tasks, and how often reports are submitted to the board and management of the NICS Operations Office. The fact that the operator has introduced a more satisfactory risk management framework does not compensate for these shortcomings. The NICS Operations Centre is responsible for the system, and must therefore establish an overarching risk framework for the entire NICS system. **The NICS Operations Office considers the principle broadly observed. Norges Bank considers the principle partly observed.**

Principle 7: Liquidity risk

An FMI should measure, monitor and manage its liquidity risk. Since the NICS system does not incur liquidity risk through its activities, most of the key considerations in the principle are not applicable to NICS. One exception is key consideration 10, which states that an FMI must aim to avoid unwinding²¹, revoking or delaying the same-day settlement of payment obligations. The NICS Operations Office has adopted rules that permit a clearing transaction to be unwound if a participant fails to meet its obligations. The NICS Operations Office has also drafted rules and procedures that facilitate settlement on the correct day and with all participants. Until now, there have been very few disruptions to the settlement of transactions cleared via NICS. **Norges Bank considers the principle observed.**

Principle 13: Participant-default rules and procedures

An FMI should have effective and clearly defined rules and procedures to manage a participant default.

²¹ Unwinding means recalculating the positions in a net settlement until all participants can cover their positions.

Norges Bank finds that the NICS system has such rules and procedures and that these have been publicly disclosed as required by the principle. Accordingly, NICS fulfils the most important objective of the principle. However, one of the key considerations in Principle 13 is that FMIs must also conduct tests of the default procedures in which the participants are involved. Norges Bank does not find that the NICS Operations Office has sufficiently involved the participants in such tests as required by the principle. Nevertheless, Norges Bank does not find that this deficiency gives grounds for concern as NICS does not hold positions against participants who have defaulted on their obligations. **Norges Bank considers the principle observed.**

Principle 17: Operational risk

An FMI should identify plausible internal and external sources of operational risk and mitigate their impact through the use of appropriate systems, procedures and controls. The NICS Operations Office's operating agreement with Nets Norge Infrastruktur is an important instrument in the Operations Office's management and control of operational risk in NICS. The operator Nets Norge Infrastruktur fulfils the key considerations that apply in connection with the management of operational risk. The NICS Operations Office's risk management framework does not clarify who is responsible for the various processes, who performs which risk management tasks, and how often reports are submitted to the board and management of the NICS Operations Office. It is not clear how NICS Operations Office manages operational risk. This is a deficiency, since NICS Operations Office is responsible for the operation of the NICS system. This deficiency is related to the shortcoming in the risk framework commented on under Principle 3. **Norges Bank considers the principle broadly observed.**

2.3 NORGES BANK'S SETTLEMENT SYSTEM

NBO was assessed against 17 of the 24 principles. The CPSS and IOSCO emphasise that, for legislative, regulatory and policy reasons, some principles must be applied in a specific way to FMIs operated by central banks. This applies to Principle 2 on governance, Principle 4 on credit risk, Principle 5 on collateral, Principle 15 on general business risk and Principle 18 on access and participation requirements.

Norges Bank considers 15 of the principles to be observed. Two of the principles are considered broadly observed. Efforts to remedy shortcomings on these points are underway.

Norges Bank considers NBO a well-run, robust system.

Principle 13: Participant-default rules and procedures

An FMI should have effective and clearly defined rules and procedures to manage a participant default. Norges Bank considers that NBO has such rules and procedures, and that these have been publicly disclosed as required by the principle. The most important objective of the principle is thus met. However, two key considerations are not fully observed. First, no formal procedures have been adopted to ensure that Finanstilsynet notifies Norges Bank when a bank is placed under public administration. Second, Norges Bank has not sufficiently involved the participants in the testing of the default procedures. **Norges Bank considers the principle broadly observed.**

Principle 17: Operational risk

An FMI should identify plausible internal and external sources of operational risk and mitigate their impact through the use of appropriate systems, procedures and controls. NBO's operations are stable, and a sound framework has been established for the management of systemic risk. Norges Bank should continue to increase its knowledge of the operation of critical NBO functions to reduce the system's vulnerability. **Norges Bank considers the principle broadly observed.**

2.4 THE DNB AND SPAREBANK 1 SMN SETTLEMENT SYSTEMS

In assessing the private settlement systems of DNB and SpareBank 1 SMN, Norges Bank has taken into account that not all of the principles are applicable to such "quasi-systems" and that only parts of some principles are applicable. Norges Bank has therefore assessed these systems against 14 of the 24 principles. In assessing the systems, Norges Bank has emphasised that they fulfil the intentions of the principles, not that each individual key consideration must be observed. Some principles (such as numbers 1, 3, 13 and 17), are also highly applicable to quasi-systems, and in these cases Norges Bank has verified that all key considerations are observed.

The evaluations show that the design and operation of DNB and SpareBank 1 SMN's systems are robust and efficient. The agreements relating to the two systems have primarily been drafted by the NICS Operations Office,²² and are clearly and appropriately formulated. Both DNB and SpareBank 1 SMN have a clear understanding of these agreements and their obligations and rights under them. Further, both DNB and SpareBank 1 SMN have sound frameworks in place for managing risk in connection with the settlement services they offer, and have implemented effective measures to limit their operational risk.

Norges Bank considers that the settlement systems of DNB and SpareBank 1 SMN observe the principles.

2.5 THE SECURITIES SETTLEMENT SYSTEM

VPO was assessed against 18 of the 24 principles. The assessment of VPO was conducted in cooperation with Finanstilsynet. In the opinion of Norges Bank and Finanstilsynet, VPO observes 15 of the principles. VPS has implemented measures expected to remedy the shortcomings before the end of 2014. Norges Bank and Finanstilsynet consider VPO a well-run, robust system.

Principle 1: Legal basis

An FMI should have a well-founded, clear, transparent, and enforceable legal basis for all of its activities in all jurisdictions in which it operates. VPS's legal basis renders the institution's activities highly secure, and VPS has adopted rules and procedures that can be implemented in relevant jurisdictions. VPS has also made relevant agreements and regulations publicly available. VPS thus generally observes Principle 1 in a manner that fosters confidence.

However, there is one unclear item in VPS's regulations, relating to the handling of participants under public administration. VPS's regulations state that a transaction involving a participant under public administration may be rejected. The cash leg of the transaction is settled by Norges Bank, and Norges Bank will reject a transaction from a bank under administration. Accordingly, VPS's agreements must be read in conjunction with the agreements employed by Norges Bank in order to understand how a transaction involving a bank under public administration will be

handled. As the operator of VPO, VPS is responsible for ensuring that the regulatory framework is consistent. **Norges Bank and Finanstilsynet consider the principle broadly observed.**

Principle 8: Settlement finality

An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time. VPS provides final settlement twice a day, and its regulations clearly define when settlement has been completed. VPS thus ensures that the most important considerations in Principle 8 are fulfilled. The principle also states that FMIs should consider gross settlement or multiple net settlements on a daily basis, but does not require these. Since VPS participants have not requested such solutions, and since such solutions are not required to reduce risk in VPS, Norges Bank and Finanstilsynet have concluded that VPS does not need to offer such services. **Norges Bank and Finanstilsynet consider the principle observed.**

Principle 12: Exchange-of-value (EoV) settlement systems

If an FMI settles transactions that involve the settlement of two linked obligations, it should do so in a manner that ensures delivery upon payment. In other words, the securities should only change hands if the purchaser can pay, and vice versa (Delivery versus Payment (DvP)). VPO employs DvP in the settlement of trades in the secondary market. Transactions in the primary market are not settled in VPO, and are thus not fully secured by means of DvP. In the view of Norges Bank and Finanstilsynet, this shortcoming does not give grounds for concern. **Norges Bank and Finanstilsynet consider Principle 12 observed.**

Principle 13: Participant-default rules and procedures

An FMI should have effective and clearly defined rules and procedures to manage a participant default. VPS has sound procedures and agreements in place for managing participant defaults, and generally fulfils the most important considerations in Principle 13 in a satisfactory manner. However, Norges Bank and Finanstilsynet do have one comment on the rules and procedures followed by VPS when managing a participant default. VPS's agreements must be read in conjunction with the agreements used by Norges Bank in order for the rules on public administration to be clear (see the discussion under Principle 1

²² See the Avtale for banker som tilbyr oppgjør på nivå to [Agreement for banks offering second-tier settlement] on the website of Finance Norway.

above). **Norges Bank and Finanstilsynet consider the principle broadly observed.**

Principle 19: Tiered participation arrangements

An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements. VPS has access to data on different types of indirect participant. In addition, VPS has set limits for the size of an indirect participant before it is deemed a risk. VPS thus fulfils the most important considerations in Principle 19, and Norges Bank and Finanstilsynet do not consider tiered participation arrangements to present a specific risk to VPS. Nevertheless, one shortcoming with respect to observance of the principle is that VPS has not arranged for quantitative analyses of tiered participation arrangements in the system, which could provide a more systematic approach to risk assessment. **Norges Bank and Finanstilsynet consider the principle broadly observed.**

2.6 VPS'S REGISTER FUNCTION

VPS's register function was assessed against 14 of the 24 principles. Norges Bank and Finanstilsynet consider 13 of the principles observed. Norges Bank and Finanstilsynet consider VPS's register function both well-run and robust.

Principle 20: FMI links

An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks. VPS has three types of links with other CSDs:

1. When part of an ISIN issued in VPS (issuer CSD) is also registered by a foreign investor CSD, i.e. when the investor CSD, either directly or through an intermediary, keeps a separate register for its customers.
2. When a foreign CSD participates directly in settlement in VPS or has its transactions settled by another participant. Since no other securities registers are participants in VPS, these links are indirect.
3. When securities issued in a foreign CSD are also partly registered²³ in VPS or through one or more intermediaries.

VPS conducts its own assessments of links falling into the first two categories, as required by the principle. Links in the third category are assessed and established by a registrar (in this case a large bank), not by VPS. VPS follows up on procedures and measures with the registrar to limit risk, and pursues recourse claims against registrars if losses arise. Such measures limit VPS's risk, but VPS does not assess the links itself as required by the principle. **Norges Bank and Finanstilsynet consider the principle broadly observed.**

2.7 OSLO CLEARING'S SETTLEMENT SYSTEM

Oslo Clearing's system was assessed against 20 of the 24 principles. Norges Bank and Finanstilsynet consider 17 of the principles observed, and three broadly observed.

Norges Bank and Finanstilsynet consider Oslo Clearing's system well-run and robust.

Principle 2: Governance

An FMI should have a governance framework that is clear and transparent and supports the stability of the financial system. Oslo Clearing has not included the consideration of financial stability or the consideration of public information in its formal objectives as required by the principle. The principle also requires an FMI to have a board composed of qualified, independent members. In the view of Norges Bank and Finanstilsynet, Oslo Clearing lacks both board members that can be regarded as independent and a published definition of what constitutes an independent board member. Oslo Clearing also lacks a risk committee, which is particularly advisable in the case of central counterparties. **Norges Bank and Finanstilsynet consider the principle broadly observed.**

²³ Involves freezing parts of an issue in a CSD and registering them in a new CSD (secondary CSD). One objective of the principle is to prevent the same security from being used multiple times.

Principle 4: Credit risk

An FMI should measure, monitor and manage its credit exposures. Central counterparties should have financial resources sufficient to cover potential losses in extreme but plausible market conditions. To calculate the necessary size of these financial resources, central counterparties must conduct stress tests covering many different scenarios. Oslo Clearing carries out such stress tests and sets aside sufficient financial resources to cover the outcomes of the tests. Nevertheless, Norges Bank and Finanstilsynet consider that Oslo Clearing could expand its stress tests to include additional scenarios. Oslo Clearing considers the principle observed. **Norges Bank and Finanstilsynet consider the principle broadly observed.**

Principle 13: Participant-default rules and procedures

An FMI should have effective and clearly defined rules and procedures to manage a participant default. Oslo Clearing fulfils the most important considerations in the principle. The principle recommends that such procedures be tested with participants at least once a year. Oslo Clearing only includes VPS and Oslo Børs in its tests, not its participants. In the opinion of Norges Bank and Finanstilsynet, this deficiency does not give grounds for concern. Oslo Clearing has been able to test its procedures in connection with actual participant defaults. Oslo Clearing also has sound procedures in place for calling for additional margins quickly when required. This reduces the risk of losses if Oslo Clearing has to close out positions as a result of a crisis or participant default. **Norges Bank and Finanstilsynet consider the principle observed.**

Principle 19: Tiered participation arrangements

An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements. In the view of Norges Bank and Finanstilsynet, Oslo Clearing has sound procedures in place for identifying large indirect participants and direct participants participating on behalf of a very large number of indirect members. To fully observe the principle, Oslo Clearing should adopt an objective threshold for the permitted size of an indirect participant. If an indirect participant exceeds this threshold, Oslo Clearing should request direct participation. **Norges Bank and Finanstilsynet consider the principle broadly observed.**

3 THE EFFICIENCY OF RETAIL PAYMENT SERVICES

Section 1 of the Norges Bank Act tasks Norges Bank with promoting an efficient payment system domestically and vis-à-vis other countries. This section discusses three topical themes that have a bearing on the efficiency of the payment system.

3.1 EU REGULATION ON CARD PAYMENTS

In autumn 2013, the Ministry of Finance initiated a consultation on a card payment regulation proposed by the European Commission. Once the regulation is adopted, it will also be introduced in Norway. In its consultation comments²⁴, Norges Bank emphasised two matters with potential consequences for the efficiency of the payment system: maximum limits on interchange fees and rules specifying what types of cards may be used. An explanation of how the card system functions is provided below as background information.

The card system

When the cardholder (the customer) pays with a card, the total amount to be paid is either debited the customer's account (debit card), or the card issuer

invoices the customer in arrears (credit and charge cards). The card issuer transfers the amount to the acquirer. The card issuer is typically a bank, while the point of sale may be a shop, for example. The acquirer is a financial institution or a bank that administers payments on behalf of the point of sale, and provides settlement to the point of sale.

The acquirer pays an interchange fee to the card issuer, and receives a point-of-sale fee from the point of sale. The point-of-sale fee must be higher than the interchange fee in order for the acquirer to cover its costs.

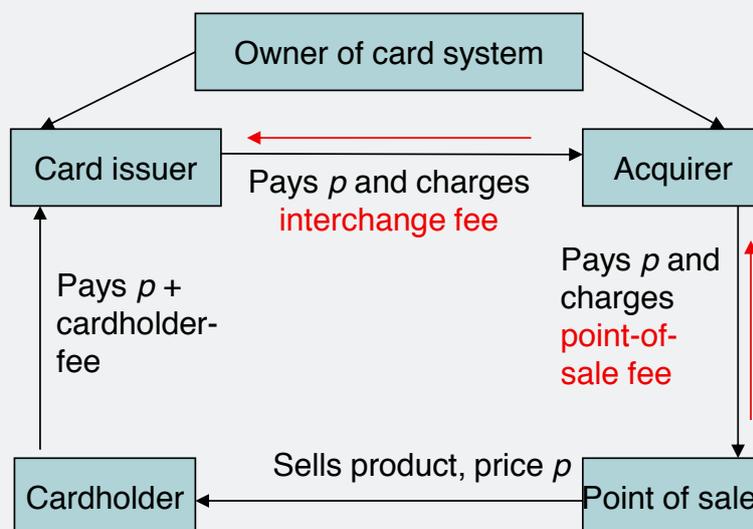
Four parties are involved in the card system: the cardholder, the point of sale, the card issuer and the acquirer. When the card issuer and the acquirer are one and the same, the system is referred to as a tripartite system. The owner of the card system is a further stakeholder (see Chart 3.1).

Caps on interchange fees

The proposed EU regulation caps the permitted interchange fees on debit cards and credit cards, respectively, in four-party systems. Visa and MasterCard are examples of four-party credit card systems.

24 Norges Bank (2013b).

CHART3.1 Fees and payment flow in card transactions



Source: Norges Bank

European regulations do not currently contain any such caps. According to the European Commission, the proposed rates have been set on the basis of the "Merchant Indifference Test" (MIT). The MIT is based on the principle that the cost to the point of sale should be the same irrespective of the type of card used.

An important condition for efficient resource utilisation is that users are charged prices that reflect the costs of using the services. Norges Bank has conducted several surveys of the social costs of payment services in Norway, most recently based on data from 2007. The surveys show that payments with international credit cards carry higher social costs than, for example, payments made using the domestic BankAxept debit card. While it is true that the different types of cards have slightly different properties, suggesting some cost differences, this cannot explain the differences in the payment costs.

Points of sale are charged low fees (typically 10–20 øre), on payments with BankAxept cards, while cardholders pay low or no fees. When customers choose to pay with international credit cards, points of sale are charged relatively large fees (typically 1%–2% of the value of the payment). Points of sale are permitted to pass on the fees to their customers. Until now, they have not done so on any significant scale, presumably on competition grounds. In other words, the cardholder, who decides which solution will be used, has no incentive to choose the payment card with the lowest total cost. The best solution for the individual is probably not the best solution for society. Points of sale may recover the point-of-sale fee by means of a general mark-up on their goods and services, to the detriment of all customers.

Average interchange fees have fallen over time (see for example the project group report (2012)). International credit card fees remain so high that social costs associated with their use are considerably higher than for BankAxept payments. Reducing interchange fees will cut the fee an acquirer has to charge the point of sale to cover its costs. Lower interchange fees will therefore likely reduce the payment costs at the point of sale and the total social costs associated with payment services. Accordingly, Norges Bank supports common European regulation of interchange fees.

It is demanding to set a fee level that ensures that payment systems are economically efficient. Norges Bank agrees that capping interchange fees based on the MIT principle is the most relevant approach. It has been proposed that the maximum interchange fees for debit and credit cards should be 0.2% and 0.3% of the transaction amount, respectively. In the case of credit cards, credit risk rises as the amount increases. This suggests that the fee should be a percentage of the amount. No credit risk arises in connection with debit cards, and other transaction costs are probably fairly independent of the transaction amount. Another possible model for debit cards is therefore an annual fee combined with a fixed amount per transaction. This model reflects the cost structure: large fixed costs and low marginal costs. Since no credit is granted on debit card transactions, it is natural for the fee on such a transaction to be lower than that charged on a credit card transaction.

Steering rules

BankAxept is used for eight out of 10 card payments in Norway. Most BankAxept cards also offer a second payment solution, often Visa. Currently, the general steering rule in Norway is that BankAxept is chosen automatically by most payment terminals, provided that the payer does not actively select a different payment solution. Under the proposed regulation, the payer will have to select the preferred solution for each individual transaction at the point of sale.

Norges Bank generally supports the principle that the customer should be free to choose. Surveys conducted in connection with Norges Bank's cost surveys reveal that many card users believe that they are using a Visa card when making ordinary point-of-sale payments, even though BankAxept is actually used. This is probably because the Visa logo is printed on the front of all Norwegian combined cards, while the BankAxept logo is displayed on the back. It seems likely that revoking the current steering rule will increase the number of payments made with international credit cards in Norway, and thus potentially increase the social costs of payment services. The current credit-card pricing strategy supports this development. If steering rules are no longer to be permitted, the logos of all payment solutions offered by combined cards should be displayed on the same side of each card. Cardholders should also be informed of the fees charged for the different card

solutions, so that they can make an informed decision.

3.2 BITCOIN AND VIRTUAL CURRENCIES

Various virtual currencies have been established in recent years. A virtual currency is a type of unregulated, digital money that is not issued or guaranteed by a central bank. It is important for the payer and payee to be familiar with the properties of the payment instrument, including the risk of losses. Central banks have a particular interest in ensuring that the payment system is robust and efficient and that the currency issued by the central bank is used to ensure that monetary policy functions as intended.

Bitcoin has no known issuer. New bitcoins are generated by a system governed by a set algorithm. Under the algorithm, the pace of new issues will slow gradually, and the ceiling on the number of coins issued will be reached around the year 2140.

In principle, transactions involving bitcoins are anonymous, since all information is transferred in the form of encrypted numeric codes. The value of bitcoins is determined by supply and demand, and prices have fluctuated widely. This implies high risk levels. Bitcoins can be used as a means of payment in various online stores. There are also some examples of bitcoins being used in restaurants and ordinary businesses in a number of countries. As yet, there are few points of sale.

Since autumn 2013, various European central banks and the European Banking Authority (EBA) have warned of the risks associated with using bitcoins. The EBA is currently considering whether virtual currencies can and should be regulated.

In the 2013, Finanstilsynet (Financial Supervisory Authority of Norway), issued a warning to consumers based on the warnings issued by the EBA:²⁵

- You can lose your money on exchange platforms.
- Your money can be stolen from your digital wallet.
- You are not protected when using bitcoins as a means of payment.
- The value of bitcoins can change rapidly, and may even drop to zero.

A problem with the anonymous nature of bitcoins is that they can be used to avoid the payment of tax and to hide/laundry the proceeds of crime. The Norwegian Directorate of Taxes²⁶ has concluded that profits on bitcoins are taxable in full and that losses are deductible. The Directorate of Taxes is of the opinion that bitcoin trading is an electronic service. This means that businesses must charge 25% value added tax on bitcoin transactions.

Under Section 14 of the Norges Bank Act, notes and coins issued by Norges Bank are the only legal tender in Norway. The use of any other means of payment is a private-law matter between the creditor and debtor. Norges Bank is of the view that any regulation of virtual currencies should be agreed internationally. Norges Bank agrees with Finanstilsynet that bitcoins and similar virtual currencies can present a high risk to their users. Norway has well-functioning payment systems, with efficient, secure and sound payment solutions for buyers and sellers of goods and services. The price of bitcoins has fluctuated considerably, and there are examples of money being stolen from digital wallets. These factors may limit the growth of bitcoins as a means of payment in Norway.

3.3 E-INVOICING - SOCIAL SAVINGS

Invoicing is not a payment service, but is closely related to debit and credit transfers. Most invoices are paid via an online banking service, for example by online transfer or direct debit. Many invoices and transfer forms are still sent to the payer on paper as the basis for manual entry via an online banking service.

Estimates indicate that society can make substantial savings by transitioning from paper invoices to fully electronic despatch and receipt of invoices. Norges Bank therefore views the increased use of e-invoices positively. The fact that public-sector bodies are requiring their suppliers to submit e-invoices is likely to boost e-invoicing among other parties.

What is an e-invoice?

When an e-invoice is issued, the invoice is presented as a payment claim in the payer's online banking service. In order for a payment to be made, the payer

25 Finanstilsynet (2013) and Finanstilsynet (2014)

26 The Directorate of Taxes (2013)

must approve it, unless the e-invoice is combined with a direct debit such that any payment claim from the issuer is automatically scheduled for payment on the due date, subject to a predefined cap on payment size.

E-invoices are currently sent to retail customers both via banks and directly by invoice issuers. E-invoices are processed electronically all along the chain of payment, from the invoice issuer to the payer and back to the invoice issuer and payee.

The working group on e-invoicing (2008) defined the term "e-invoice" as "... an invoice in an agreed form that is transported electronically from the invoice issuer to the invoice recipient, and that can be processed electronically by the invoice recipient. It is insufficient for the invoice to be 'electronic' or available electronically. Data must also be structured in such a manner that the document can 'flow' between different systems."

What costs arise in connection with the processing and payment of invoices?

The invoice issuer

Apart from the pure labour cost of issuing an invoice, the invoice issuer incurs costs connected to the actual invoice form, the printout, transportation and postage. The manner of dispatch to the payer also impacts the costs associated with receiving payment. If a payment is not registered electronically, additional costs arise in connection with payment follow-up and timely entry in the accounts. The situation is different if the payee receives the invoice via an online banking service and a KID identification number is used; manual processing and control procedures are then reduced significantly.

The invoice recipient

If e-invoicing is combined with a direct debit, the payer spends minimal time on payment operations other than checking the movements on his or her bank account. Alternative solutions require the payer to spend time on the payment operation.²⁷ Savings are smaller for households than for private businesses or public enterprises, which often have more detailed processing procedures.

²⁷ The Ministry of Finance (2005) recommends that time costs should be estimated based on wages. Leisure time also has value.

What does invoice processing cost, and what is the scope for savings?

Certain assumptions have to be made to calculate the costs of invoice processing in Norway. The calculations are therefore uncertain. The assumptions and calculations are described in Haare (2014).

We estimate the annual cost of invoice processing to total around NOK 45bn, split between the cost of issuing invoices (NOK 25bn), and the cost of receiving invoices (NOK 20bn).

The scope for savings has been calculated by estimating the costs in a situation where all invoicing and payment occurs electronically, and then deducting the resulting figure from the cost of the current solution as described above.

Norges Bank has calculated that the scope for annual saving is around NOK 25bn – NOK 13bn linked to the issue of invoices and NOK 12bn to the receipt of invoices.

Similar calculations from other countries

Calculations from other countries show similar potential annual savings. We can apply these figures to Norwegian volumes to provide a comparison with our estimate.

The UK E-Invoicing Advocacy Group (2010) estimated the potential annual saving in the United Kingdom to be on the scale of GBP 22–28bn. Applied to Norwegian volumes, this would mean savings of NOK 18–23bn per year.

The European Association of Corporate Treasurers (2007) estimated the scope for annual savings in the EU area at EUR 243bn. Applied to Norwegian volumes, this would mean savings of some NOK 20bn per year.

Since our estimate is more recent, additional account has been taken of previously realised benefits in Norway than in the foreign studies. There may also be other differences between the studies.

Although the figures vary, both Norges Bank's estimates and those of foreign studies show that society can save substantial amounts every year by wider use of e-invoicing.

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DEFINITIONS AND ABBREVIATIONS

Only definitions and abbreviations that are specific to the Norwegian system are included. The international reader is assumed to find definitions of general concepts in material released by the BIS, EU, etc.

Autogiro: A form of direct debit allowing an enterprise to draw funds from a payer's bank account for outstanding receivables on the due date.

Avtalegiro: A form of direct debit whereby funds to cover recurring payments are automatically drawn from the payer's bank account on the due date.

BankAxept card: Debit card issued by Norwegian banks and linked to the customer's bank account for use in Norway. It is the dominant card system for transactions in Norway.

BankAxxess: Payment solution for online payments from bank accounts using BankID.

BankID: A PKI-based (public key infrastructure) form of electronic identification which can be used for online payments or payments via mobile device.

Bedriftsterminalgiro (company terminal giro systems): Payment solutions for enterprises. The solutions require installation of software in the user's/enterprise's computer system. Used for both individual payments and retail payments to payees with or without bank accounts.

Combined payment card: Payment card with more than one of the following three functions: BankAxept card, domestic credit card and/or payment card issued by an international card company.

Electronisk handelsformat (EHF): A data interchange format for electronic invoicing used in Norway and based on the CEN BII standard.

EVRY: Formerly EDB ErgoGroup. IT company established through the merger of Ergo Group AS and EDB Business Partner ASA. The company is a key provider of IT services to DNB, the Sparebank 1-group and Norges Bank.

Finance Norway: the trade organisation for banks, insurance companies and other financial institutions in Norway.

Nasdaq OMX Oslo NUF (branch of Nasdaq OMX Stockholm): Central counterparty for energy derivatives.

NBO: Norges Bank's settlement system in which banks can settle claims and liabilities with other banks through their accounts in Norges Bank. NBO comprises both gross and net settlement facilities.

NICS: Norwegian Interbank Clearing System is the banks' joint clearing system for transactions denominated in NOK. It is used by all banks that are part of the industry's common payment services infrastructure. Cleared positions in NICS are settled in NBO.

Oslo Clearing: central counterparty for trading in equity capital instruments and derivatives with securities as the underlying instrument. Owned by SIX x-clear from 2 May 2014.

Postal giro: The payer sends a paper-based credit transfer through the post to Nets, instead of paying a giro over the counter at a bank.

VPO: Norwegian securities settlement system.

VPS: Norwegian Central Securities Depository.

ANNEX¹

TABLE 1: AVERAGE DAILY TURNOVER IN CLEARING AND SETTLEMENT SYSTEMS (TRANSACTIONS)

	2001	2002	2003	2004	2005	2006	2007	2008	2009 ³	2010	2011	2012	2013
NICS													
NICS Gross	303	300	596	611	532	547	593	605	524	568	548	594	659
NICS SWIFT Net ¹	4 719	4 925	5 155	4 480	4 744	5 301	5 908	6 390	6 269	-	-	-	-
NICS Net (million) ²	3.4	3.7	4.0	4.3	4.7	5.1	5.5	5.9	6.5	6.8	7.2	7.8	8.2
NBO													
Total number of transactions									1 165	1 146	1 138	1 274	1 406
RTGS Gross transactions excl. NICS									463	477	479	549	595

1 Phased out in June 2010.

2 Previous NICS Retail and NICS SWIFT Net payments below NOK 25m included as from June 2010 in NICS Net.

3 For NBO the figures for 2009 are calculated for the period 17 April to 31 December. There is a break in the series this year.

Sources: The numbers under NICS are from the NICS Operations Office. The numbers under NBO are from Norges Bank

TABLE 2: AVERAGE DAILY TURNOVER IN CLEARING AND SETTLEMENT SYSTEMS (IN BILLIONS OF NOK)

	2001	2002	2003	2004	2005	2006	2007	2008	2009 ³	2010	2011	2012	2013
NICS	211.4	212.5	248.7	195.7	200.8	224.8	254.5	246.6	213.1	196.5	221.4	247.8	253.5
NICS Gross	151.2	149.5	187.8	129.4	135.5	155.3	176.8	165.9 ¹	124.1	107.2	119.1	138.6 ⁴	136.0
NICS SWIFT Net ²	16.1	16.2	12.6	5.2	5.7	6.7	7.6	7.3	6.1	-	-	-	-
NICS Net ³	44.1	46.8	48.3	61.1	59.6	62.8	70.1	73.4	82.9	89.3	102.3	109.2	117.5
NBO	172.1	169.2	206.8	152.3	160.8	185.2	226.1	224.9	168.4	162.2	172.1	201.9	188.3
NICS Gross	150.7	149.5	187.7	128.9	135.5	155.3	180.2	163.9 ¹	113.2	106.3	119.0	137.7	135.2
RTGS Gross transactions excl. NICS	6.9	4.8	7.2	11.1	12.1	16.1	31.1	45.6	40.2	42.5	42.4	51.1	38.5
NICS SWIFT Net ²	5.3	5.5	2.1	1.0	0.9	1.0	1.2	1.1	0.9	1.1	-	-	-
NICS Net ³	6.8	6.9	6.7	7.6	8.5	8.1	8.1	9.2	9.6	7.1	6.3	8.7	10.3
VPO and Oslo Clearing	2.3	2.5	3.1	3.7	3.8	4.7	5.5	5.1	4.5	5.3	4.5	4.4	4.2
VPO						4.4	5.1	4.9	4.4	5.2	4.5	4.4	4.2
Oslo Clearing						0.3	0.4	0.3	0.1	0.1	0.1	0.0	0.0

1 Gross transactions through NICS: The difference in value under NICS and NBO is partly due to the use of a backup solution in October 2008.

2 Phased out in June 2010.

3 Previous NICS Retail and NICS SWIFT Net payments below NOK 25m included as from June 2010 in NICS Net.

4 For NBO the figures for 2009 are calculated for the period 17 April to 31 December. There is a break in the series this year.

Sources: The numbers under NICS are from the NICS Operations Office. The numbers under NBO are from Norges Bank

1 For tables showing developments in retail payment services, see *Norges Bank Papers* 1/2014.

TABLE 3: NUMBER OF PARTICIPANTS IN CLEARING AND SETTLEMENT SYSTEMS (AT YEAR-END)

	2006	2007	2008	2009	2010	2011	2012	2013
Norges Bank's settlement system (NBO): Banks with account in Norges Bank	145	142	143	140	134	129	130	128
Norges Bank's settlement system (NBO): Banks with retail net settlement in Norges Bank	23	23	22	21	21	21	22	22
DNB	104	103	103	106	105	103	98	98
Sparebank 1 Midt-Norge	17	18	16	16	13	12	11	11
Norwegian Interbank Clearing System (NICS)	146	146	143	145	142	138	132	131

Source: Norges Bank

