NORGES BANK

2017

FINANCIAL INFRASTRUCTURE REPORT

Norges Bank
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Address: Bankplassen 2
Postal address: P.O. Box 1179 Sentrum, N-0107 Oslo
Phone: 22 31 60 00
Fax: 22 41 31 05
E-mail: central.bank@norges-bank.no
Website: http://www.norges-bank.no

Editor: Øystein Olsen
Design: Brandlab
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Contents

Executive Board's assessment

The *Financial Infrastructure Report* is part of Norges Bank's work to promote financial stability and an efficient payment system in Norway. Norges Bank's Executive Board discussed the *Report* at its meeting on 3 May 2017.

Norges Bank monitors the activities of interbank and securities settlement systems through ongoing supervisory and oversight work. Over the past year, there have been few system disruptions, and these systems comply to a large extent with international principles.

The Executive Board considers the financial infrastructure in Norway to be generally efficient. This means that payments can be carried out swiftly, safely, at low cost and tailored to users' needs. At the same time, there is room for improvement.

Fast payments are transactions where funds are made available in the payee's account only seconds after payment is initiated. The public's demand for such payment services will likely grow in the period ahead. Existing Norwegian fast payment solutions are not designed to meet this increased demand. These solutions cannot be used for certain types of payments, and payments are subject to transaction limits. In addition, banks incur credit risk when retail customers of different banks make fast payments to one another. It is the Executive Board's view that a new underlying infrastructure should be put in place for fast payments without the drawbacks of current solutions. This new infrastructure may facilitate increased usage and enable fast payment solutions to handle higher amounts. Together with Finance Norway, Norges Bank has launched a project to develop and implement such an infrastructure for fast payments. The aim is for all banks to utilise a common provisional solution in 2017, with the rollout of the permanent common solution by the end of 2019.

Cyber crime can pose a threat to financial stability. The payment system's dependence on IT exposes it to cyber attacks. Norges Bank ensures that the lines of defence of the interbank systems under the supervision of Norges Bank are adequate. An important element is that financial market infrastructure (FMI) owners ensure that critical IT service providers have in place resilient contingency arrangements and that these are tested regularly. Norges Bank will also continue to strengthen contingency arrangements for protecting settlement at Norges Bank.

The technical operation of the payment system is largely outsourced. FMI owners' responsibility does not change because all or part of operations are carried out externally. FMI owners are required to have resources and expertise to monitor service providers. In the 2015 *Report*, Norges Bank expressed the view that risk management of outsourced operation of systemically important payment systems needed to be improved. FMI owners have taken steps in this regard. Norges Bank will monitor FMI owners' control of outsourced operations, in line with recommendations from the International Monetary Fund (IMF).

Electronic contingency solutions are in place to ensure rapid resumption of operations in the event of a disruption. However, no electronic contingency solution exists that is sufficiently independent of the ordinary payment system. Ultimately, therefore, back-up arrangements involving cash are an important part of overall contingency planning for the payment system. Norges Bank and Finanstilsynet (Financial Supervisory Authority of Norway) are of the view that banks have a responsibility to supply cash to customers in a contingency, and have proposed a regulation clarifying banks' responsibility in this regard.

Norges Bank's responsibility

The financial infrastructure comprises the payment system and securities settlement system. The purpose of the financial infrastructure is to ensure that payments and financial instrument transactions are recorded, cleared and settled.

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 carries out payment transactions swiftly, safely, at low cost and tailored to users' needs.

Norges Bank promotes an efficient payment system by:

- **monitoring developments in the financial infrastructure and inducing change that can improve its efficiency;**

- **overseeing and supervising individual participants;**

  Norges Bank licenses and supervises systems for clearing and settlement of interbank money transfers (interbank systems). This supervisory responsibility is set out in Chapter 2 of the Payment Systems Act. Norges Bank ensures that interbank systems comply with the provisions of the Payment Systems Act.

  Norges Bank's oversight activities are based on Section 1 of the Norges Bank Act and international principles.

- **providing secure and efficient settlement of interbank payments in banks' accounts with Norges Bank; and**

- **issuing banknotes and coins.**

In the *Financial Infrastructure Report,* Norges Bank provides an account of its supervisory and oversight work, and recommends changes in and improvements to the financial infrastructure where, in the Bank's judgement, they are needed. The *Report* also contains discussions of relevant topics and challenges facing the financial infrastructure.

1 Challenges facing the financial infrastructure

An efficient payment system enables payments to be carried out swiftly, safely, at low cost and tailored to users' needs. While digitalisation increases the efficiency of the payment system, it also poses challenges such as those related to cyber crime and outsourcing.

Electronic contingency solutions that are sufficiently independent of the ordinary payment system do not currently exist. For that reason, cash is ultimately an important component of the payment system's overall contingency arrangements.

1.1 CYBER CRIME

The number of cyber attacks is rising, and the methods employed are becoming increasingly sophisticated. This requires an intensified effort by both the authorities and private owners of financial market infrastructures (FMIs). FMI owners and authorities should cooperate on both a national and international level to combat cyber crime.

At an international level, the Financial Stability Board (FSB), the Bank for International Settlements (BIS) and the International Organization of Securities Commissions (IOSCO) consider cyber crime to be one of the most significant threats to financial stability.[1] Cyber security was on the agenda of a meeting of G20 Finance Ministers in March 2017, since successful cyber attacks can seriously damage the global financial infrastructure owing to its close interconnectedness.

Payment systems are highly centralised, making them vulnerable to cyber attacks. A successful cyber attack may result in heavy financial losses and prevent customers from completing their payments. A successful attack may also result in sensitive information ending up in the wrong hands.

Unlike other causes of operational disruptions, cyber attacks are deliberate. The motives for cyber attacks may include financial gain, obtaining information or disrupting service. The parties behind these attacks can be organised criminals, activist hackers or insiders. Some of these may enjoy the support of foreign governments.[2] Cyber attacks are becoming increasingly sophisticated, making it necessary to adapt contingency arrangements. This requires that FMI owners work diligently and systematically to reduce the likelihood of a successful attack.

1 IMF (2016).

2 Office of Financial Research (2017).

Central banks are also vulnerable to cyber crime. In 2016, a cyber attack resulted in the disappearance of USD 81m from the Bangladesh central bank's account with the Federal Reserve. Stolen identification was used to obtain access to the account. Norges Bank will continue to strengthen its contingency planning to protect Norges Bank's interbank settlement system.

Payment system participants have largely outsourced IT operations, and a number use the same IT service provider. Professional IT service providers may be better qualified and have more resources available to develop effective lines of defence against cyber attacks. Use of external service providers may thus reduce the risk of a successful cyber attack. On the other hand, key service providers that serve several FMIs at the same time may be at a higher risk of cyber attacks because the impact of a successful attack against them is potentially more serious. Attacks can take various forms. First, criminals can attempt to gain access to information on an FMI by attacking an IT service provider directly. An attack can also be directed at the IT service provider's other clients in order to obtain access to information about the FMI. Service providers' arrangements for securing their operations to prevent criminals from gaining access to information – either directly or indirectly via other clients – must be included in risk assessments of outsourced operations. FMI owners are responsible for their operations as a whole and must ensure that both service providers and subcontractors, if any, have put in place effective measures to reduce the likelihood of a successful cyber attack.

CPMI-IOSCO has issued guidance on cyber resilience for FMIs.[3] This guidance supplements the international principles from CPMI-IOSCO, against which Norges Bank assesses FMIs (see box on page 24). One important purpose of the guidance is to ensure consistent cross-border application. The financial infrastructure

3 CMPI-IOSCO (2016)

is global, with interconnected participants in different countries. Measures to combat cyber crime therefore require cooperation at both a national and international level. Participants in the Nordic financial sector plan to establish Nordic Financial CERT, a collaborative effort intended to identify and combat cyber attacks. Norges Bank will continue to give weight to the guidelines from CPMI-IOSCO in its oversight and supervision of FMIs ahead.

1.2 OUTSOURCING

Outsourcing involves transferring the performance of tasks to an outside contractor rather than performing them internally. As mentioned above, in the payment system, IT system development and operations are largely outsourced.[4] FMI owners' responsibility for outsourced operations will make considerable monitoring demands on owners. FMI owners need to have sufficient resources and qualified personnel to monitor the performance of service providers effectively.

Outsourcing enables users to benefit from economies of scale, because several users are served by the same service provider. Professional IT service providers may have the resources and expertise to develop more resilient solutions than individual payment system participants are able to do on their own. This may reduce the likelihood of an operational disruption. At the same time, the fact that a large number of payment system participants have outsourced IT system operations to the same service provider entails concentration risk. The failure of a key IT service provider can have an impact on a sizeable portion of the payment system.

In 2016, a task force headed by Finanstilsynet (Financial Supervisory Authority of Norway) issued recommendations on the outsourcing of IT tasks by FMIs. The Ministry of Finance and Norges Bank were also represented. The task force recommended risk-reduction measures for outsourced operations, and also considered whether some tasks are so vital to the payment system that IT operations should take place in Norway. Norges Bank will follow up on the recommendations that are relevant to Norges Bank's settlement system and the interbank systems under the supervision of Norges Bank.

In its assessments of system owners' outsourcing of IT tasks, Norges Bank gives weight among other matters to:

- ensuring that the ability to manage and monitor the activity is not impaired;
- determining whether the service provider to which the operations are outsourced is subject to supervision;
- deciding whether for security reasons some tasks should be performed in Norway; and
- assessing risk in the relevant country when operations are outsourced abroad.

1.3 RESPONSIBILITY FOR CONTINGENCY ARRANGEMENTS FOR CASH DISTRIBUTION TO THE PUBLIC

In its oversight of the payment system in recent years, Norges Bank has given considerable weight to ensuring robust contingency arrangements in the payment system and satisfactory management and control of operations by system owners.

Since the payment system is intended to meet society's needs for facilitating and settling payments for goods and services, disruptions in the payment system may have serious consequences for society. The authorities therefore give weight to ensuring that the payment system's contingency arrangements are satisfactory.

In the 2016 *Financial Infrastructure Report*, Norges Bank pointed out that banks' contingency arrangements for cash distribution may prove inadequate in a crisis situation.[5] In a letter to the Ministry of Finance in autumn 2016, Finanstilsynet and Norges Bank stated that banks' responsibility for cash distribution to the public also applies in a contingency and proposed a regulation to clarify banks' obligations in this regard. At the beginning of 2017, the Ministry of

4 Norges Bank discussed challenges related to outsourcing in Norges Bank (2015).

5 See Norges Bank (2016).

Finance circulated a draft regulation for public consultation, with a closing date of 2 May 2017.

Norges Bank's and banks' responsibilities in the area of cash distribution

Norges Bank supplies cash to banks on the basis of banks' deposits in the central bank. Banks supply cash to their customers on the basis of customers' bank deposits. When bank customers want to convert between bank deposit money (claims on banks) and cash (claims on the central bank), they make cash withdrawals and deposits. Such customer preferences drive banks' demand for cash from Norges Bank.

Banks are required to accept cash from customers and make deposits available to customers in the form of cash in accordance with their customers' expectations and needs.[6] The preparatory works for the Financial Undertakings Act specify that banks are free to make their own arrangements to meet this requirement. The provision does not bar banks from charging fees for deposits or withdrawals. Nor is there a requirement for banks to perform cash handling services themselves.[7]

Banks have largely outsourced their cash services. This does not change banks' obligations and responsibilities to customers.[8]

Responsibility for contingency arrangements for cash

It is conceivable that in the future, a number of alternative and technologically independent payment systems will exist that will be able to function as contingency solutions if disruptions occur in the ordinary electronic payment system. Electronic payment solutions do not currently exist that are sufficiently independent of the ordinary payment solutions and that are able to fill such a contingency role. Cash is therefore needed as a back-up.

The responsibilities in a contingency of the various participants should be clarified. The extent of banks' obligations under the Financial Undertakings Act may be perceived as unclear. Therefore in autumn 2016, Finanstilsynet and Norges Bank proposed in a letter to the Ministry of Finance that a regulation be laid down specifying that banks have a responsibility to distribute cash to customers in a contingency.

6 Cf Section 16-4 of the Financial Undertakings Act.
7 Cf Section 13.16 of Prop. 125 L (2013–2014).
8 Cf Section 13-4 of the Financial Undertakings Act.

In its draft regulation, Finanstilsynet and Norges Bank propose that:

- Banks establish solutions and routines for cash distribution in the event of a disruption in the electronic payment system. Customers shall be able to withdraw cash within a reasonable travel distance and within a reasonable period of time.
- If banks have outsourced cash services, banks must issue guidelines and enter into agreements with cash handling companies and other service providers to establish clear routines for meeting increased demand for cash at short notice.
- Banks must have contingency arrangements for cash handling in instances when the cash handling company is incapable of meeting its contractual obligations.

2 Developments in the payment system

The payment system is evolving rapidly. Advances and innovations in payment services are being driven by new technology, new providers and new rules.

Consumers and firms are increasingly using cards, online banking and mobile phones to make payments. Underlying these payment services is an extensive infrastructure which includes settlement between banks. Together with Finance Norway and Bits, Norges Bank has launched a project to develop and implement a new infrastructure for fast payments. The aim is for funds to be available in the payee's account within a few seconds of a payment being initiated, with minimal risk to banks.

2.1 NEW PAYMENT SERVICES TECHNOLOGY AND PROVIDERS

Payments are increasingly being made using mobile technology. Banks have developed payment apps for mobile phones that have been widely adopted in Norway. New technology and new rules are paving the way for operators other than banks to provide payment services. New technology and new operators could lead to users being offered cheaper, more secure and more user-friendly payment services. At the same time, there are aspects that constitute a number of challenges for the efficiency of the payment system.

Payment apps have been around for a number of years now. For example, it has long been possible to use a web browser to make payments online. Mobile apps offer a more mobile-friendly interface for payments. Mobile phone technology can also be used for secure authentication of payments. The largest providers in the Norwegian market for mobile payment apps are Vipps, developed by DNB, and MobilePay, developed by Danske Bank. Both are now being turned into separate companies associated with more banks through broader ownership.

Large international technology companies have developed their own mobile payment apps. These companies are not currently major operators in the Norwegian market for payment services, but already have large customer bases in other areas which may provide a platform for rapid growth in the provision of payment services.

Proprietary solutions

An effective means of payment is one that can be used everywhere. One challenge is that different banks and bank alliances each have their own payment solutions, and these solutions can only be used at specific merchants. Payment services from large international technology companies may accentuate this trend. These companies may find it profitable to develop proprietary solutions tied to their other services. For example, payment services may be integrated into other apps, such as a messaging app, and then only be used by users of that service. Mobile technology producers may also prevent others from offering payment services on their platforms through the design of hardware and intellectual property rights.

Proprietary solutions in the market for mobile payment services may hamper economies of scale, and complicate payments across banks and apps. Competition for customers should be based on open, shared solutions that realise economies of scale. Competition between service providers to control infrastructure or standards by means of proprietary solutions and exclusivity agreements with merchants can undermine efficiency.

Together with Finance Norway and Bits, Norges Bank has launched a project in which banks will develop a common infrastructure for fast payments (see Section 2.2). This would enable payments to be made quickly across apps based on a common underlying infrastructure.

The existence of numerous different payment apps can also create difficulties for merchants, who have to choose which of these apps to offer their customers as a payment solution. A number of producers are developing terminals that can handle a wide range of apps. This could increase efficiency and user-friendliness, but there are also some challenges here. If standardised terminals act as a gatekeeper for providers wishing to offer payment services, this could restrict market access for new developers of payment services.

Cost-effective solutions and new rules

To date, payment apps have largely been based on international payment cards as the underlying payment instrument. These cards have traditionally been expensive to use and are not necessarily the most cost-effective solutions. The consumer also runs the risk of paying for ancillary services more than once: both providers of payment apps and the underlying payment cards often offer additional services such as fraud protection.

The costs associated with payment apps may change. First, BankAxept has been working on a solution where it can be used as the underlying payment instrument for payment apps, which could make payments cheaper.

Second, new rules may cut the cost of using international payment cards. The new Regulation on Interchange Fees, which is part of the package of measures associated with the EU's revised Payment Services Directive (PSD2), imposes limits on card schemes' fees, which could lead to lower costs for using cards covered by the regulation.

In the slightly longer term, PSD2 will enable new payment service providers to initiate account-to-account payments on behalf of the customers outside card schemes. Although PSD2 will make it easier for new operators to enter into payment services, banks will still play an important role in the payment system by offering means of payment and an account infrastructure. PSD2 and the Regulation on Interchange Fees are discussed further in the box on page 9.

Pricing and contractual terms

In principle, the price of a service should be equal to its marginal cost. Prices will then contribute to efficient allocation of resources, as the customer's valuation of the service reflects the cost of producing it. Additional costs relating to a payment service should therefore be passed on to the customer.

Banks price payment services as part of their overall range of services. Technology companies will also take into account how payment services affect sales of other services. It should be easy for the customer to compare prices and quality when choosing a payment service. A multitude of payment apps from providers with complex business models can make it difficult for customers to compare prices, ancillary services and data protection. This may mean that price is an ambiguous indicator of underlying costs, and that customers may not choose the right solutions for their needs.

PSD2 contains rules for passing on costs to payers. In principle, a merchant may charge the customer extra for the use of a payment service. On the other hand, the merchant may not charge more than the extra cost associated with that payment service. Thus the directive provides for more efficient use of payment services by ensuring that the price of a service cannot be set higher than its cost.

However, a merchant may not charge a customer extra for using a card covered by the caps in the Interchange Fee Regulation. These caps have been set at a level that corresponds to the merchant's costs where the customer pays in cash. If the merchant's pricing takes account of the customer using cash, it will necessarily also take account of the use of cards covered by the caps.

Security in the payment system

New operators and new technology are impacting on security in the payment system. New technology is paving the way for more secure payments, for example through secure authentication. PSD2 contains strict requirements for payment service providers when it comes to procedures for the authentication of payments and the provision of collateral to cover losses.

New operators can also present challenges for security in the payment system. More operators need to be supervised and overseen. If payment services are offered by large international companies, the consequences of technical failures at individual companies may be greater. Norges Bank is assessing the degree to which new operators and new technology could affect security in the payment system and financial stability. One key element in this assessment is cyber crime (see Section 1.1).

Reliance on banks' account infrastructure

These new services and regulations are largely based on banks' account infrastructure.

However, there are also mobile payment services that operate outside banks' account infrastructure. E-money companies offer solutions where a customer can preload an app with money by transferring funds to the e-money company. The app can then be used for payments and other transfers. One example of such a solution is PayPal. E-money solutions are nevertheless linked to banks' account infrastructure. Customers will normally pay money from a bank account to load the e-money app with money, and

PSD2 AND THE REGULATION ON INTERCHANGE FEES

The EU Payment Services Directive entered into force in 2007 and has been incorporated into the EEA Agreement. The main aim of the directive is to promote secure and efficient payment services in the EU/EEA.

In 2013, the European Commission presented proposals for a revised version of the directive, PSD2, referring to a need for a more harmonised approach across member states and new services that could help achieve the objectives of the directive:

- A more integrated and efficient market for payments in the EU
- A more level playing field for payment service providers
- Making payments safer and more secure
- Protecting consumers
- Lower prices for payments

PSD2 facilitates two new types of services: payment initiation and account information. Through regulated access to the account system, a provider of payment initiation services will be able to effect payments from one account to another, typically between a customer and a merchant. In practice, this is an alternative to card services. Account information services will make it possible for customers to obtain information on their accounts across different banks and countries.

Providers of payment initiation and account information services will be subject to supervision, regulation and oversight by relevant authorities.

On 28 April 2017, the Ministry of Finance circulated for comment draft rules for implementing portions of PSD2, with a consultation closing date of 18 August 2017. The directive also affects areas under the Ministry of Justice and Public Security. The Ministry of Justice and Public Security will prepare a separate consultation document for its areas of responsibility.

The Regulation on Interchange Fees is part of the package of measures associated with PSD2. It was issued on 27 June 2016 and implements the EU's Interchange Fee Regulation in Norway. The aim is to increase competition in the payment market and reduce payment costs for consumers. The regulation caps the fees that card issuers may charge acquirers (typically the merchant's bank) at 0.2% of the transaction value for debit cards and 0.3% for credit cards. For a more detailed presentation of the structure and fees for payment cards, see Norges Bank (2016).

payments from an e-money account will often go to the payee's bank account.

There are also payment apps where private digital currencies such as Bitcoin can be used to make payments. Such currencies are not a widely used means of payment in Norway for now.

Norges Bank is investigating whether there is a need to offer electronic central bank money in addition to cash (see box on page 11). It is too early to predict the outcome of this work. Similar projects have been started up by other central banks.

Norges Bank's work on electronic central bank money for the public

In an efficient payment system, payments take place quickly and securely, at the lowest possible cost to society and tailored to users' needs. Norges Bank is investigating how the efficiency of the Norwegian payment system will be affected by a decrease in the use of cash, and whether electronic central bank money can provide desired properties for the payment system of tomorrow.

The share of cash as a means of payment used by the public continues to decline, while the share of deposit money is rising. Deposit money consists of claims on private banks. Electronic central bank money could offer the public an alternative to cash. Like cash, electronic central bank money is a claim on the central bank.

If Norges Bank decides to supply electronic central bank money, this would not, in principle, be intended to replace or compete with cash but to complement it. The Bank will continue to supply banknotes and coins for as long as the public requires them.

Norges Bank will be looking into the possible technical solutions for implementing electronic central bank money. Both centralised and decentralised solutions will be considered. A centralised solution might, for example, mean that individuals can open an account at the central bank or in a system controlled by Norges Bank. Another possibility is for the central bank to issue a plastic card or develop an app with which people can make payments. Some solutions may require changes in the law and approval by the Storting (Norwegian parliament).

Norges Bank will also investigate what consequences new forms of central bank money might have for the banking system, financial stability, the implementation of monetary policy and other areas.

The matter of electronic central bank money raises a number of complex issues. The literature in the field is in its infancy. It is likely that this work will take a number of years. Norges Bank will attach importance to contact with other central banks, academia and other national and international participants in its work.

2.2 FAST PAYMENTS

As early as in the 1970s, a few countries launched real-time gross settlement (RTGS). Norges Bank's settlement system introduced real-time settlement in 1999. In these solutions, only a very short amount of time – often just seconds – elapses between a payment being initiated by the payer and being received in the payee's account. These solutions were developed for the settlement of payments between banks and other participants in financial markets, while payments that involve ordinary retail customers and companies are normally sent using solutions that take longer.

In recent years, however, solutions for fast payments between retail customers have also been introduced in a number of countries, including the UK in 2008, Sweden in 2012 and Denmark in 2014. The solutions in these countries share two important features: First, a payment reaches the payee a few seconds after the payment is made, 24 hours a day, 365 days a year. Second, banks are not exposed to credit risk even though payments are immediately available to customers.

Challenges posed by existing fast payment solutions in Norway

Solutions that enable retail customers at different banks to make fast payments to one another have also been introduced in Norway. The public's demand for such payment services will likely grow in the period ahead. Existing Norwegian fast payment solutions are not designed to meet this increased demand. These solutions cannot be used for certain types of payments, and payments are subject to transaction limits. In addition, banks incur credit risk when retail customers of different banks make fast payments to one another (see box on page 12). The higher the usage of fast payment solutions, the greater the need will be to control this credit risk.

Improved Norwegian solution for fast payments

In autumn 2016, Norges Bank and Finance Norway launched a project to develop and implement a new common infrastructure for banks without the drawbacks of current fast payment solutions and with the capacity to handle higher future use. A task force was appointed, which delivered a report in spring 2017 with proposals for the development of such an infrastructure. Rollout of the permanent common solution is planned for the end of 2019, with all banks using a provisional common solution in the meantime. The task force's report is to be considered by the governing bodies of Norges Bank, Finance Norway and Bits in summer 2017.

The key elements of the proposed solution are:

- The payee's bank credits the payee's account immediately.
- The solution is to be available to customers of all banks 24 hours a day, 365 days a year, and handle consumer-to-consumer, consumer-to-business and business-to-business payments.
- The solution must be able to handle bill payments with a CID (customer identification) number or other form of detailed information.
- Payments are exchanged and cleared as they are made and a position is calculated for each bank.
- To prevent credit risk arising, each bank deposits liquidity in a separate account at Norges Bank. The sum set aside in this account ensures that banks can cover the liabilities they incur.
- Balances between banks are settled in central bank money during Norges Bank's opening hours, thus avoiding banks building up positions against one another over longer periods.
- Banks will be able to place their own retail payment solutions, such as mobile banking apps, on top of the solution.

Banks will be able to participate both directly and indirectly in the new fast payments solution. Those that participate indirectly must piggyback on a direct participant. The direct participant must cover both its own position and the position of relevant indirect participants in the settlement at Norges Bank. Exposures will then arise between the indirect participants and the direct participant they use. Rules on how this exposure should be handled, including any limits on the size of this exposure, are to be agreed between the banks themselves.

CREDIT RISK IN CURRENT NORWEGIAN FAST PAYMENT SOLUTIONS

A large portion of interbank balances arise because customers of different banks make payments to one another. A payment between two retail customers of different banks can be handled in two ways:

1 The payee's bank credits the payee's account after the banks have settled. Currently, interbank settlements on the basis of banks' payment services take place five times a day on business days, but no settlements take place on weekend or on other public holidays.[1] A large share of payments are currently handled in this way.

2 The payee's bank credits the payee's account immediately, *before* the banks have settled. The payee's bank thus assumes credit risk until it has received funds from the payer's bank. In this context, credit risk means the risk that for various reasons the payee's bank does not receive – and loses – the amount it has credited the payee.

In 2012, banks launched a common infrastructure for fast payments.[2] In this solution, the payee's bank credits the payee's account before it receives funds from the payer's bank. To limit the size of potential losses for individual banks in the event that the payer's bank defaults, a loss-sharing agreement has been entered into between all of the participating banks. At the end of April 2017, however, several of the larger banks had still not taken this solution into use.

Banks can also offer customers fast payments without using the infrastructure put in place in 2012, but these payments will not be covered by the loss-sharing agreement. In such cases, where the payee's bank credits the payee's account before the amount is transferred from the payer's bank, the payee's bank assumes credit risk until it has received the amount.

1 Settlements take place on business days at 5.30 a.m., 9.30 a.m., 11.30 a.m., 1.30 p.m. and 3.30 p.m.
2 The solution is known as *straksbetalinger* (instant payments).

3 Developments in financial market infrastructures – supervision and oversight

Norges Bank monitors the operation of the interbank systems and the securities settlement system through ongoing supervision and oversight. There were few disruptions in these systems during the year, and they largely comply with international principles.

3.1 NORGES BANK'S SUPERVISORY AND OVERSIGHT WORK

Supervision

Norges Bank supervises the clearing and settlement systems for transfers of funds between banks (interbank systems). The Bank's responsibility for supervising interbank systems is set out in Chapter 2 of the Payment Systems Act. The Bank awards licences and supervises the interbank systems' compliance with the Payment Systems Act and licence terms. Should Norges Bank uncover any non-compliance with the Act or licence terms, it will instruct the operator of the system to rectify the matter. As a last resort, the Bank may revoke its licence.

Norges Bank supervises:
- the Norwegian Interbank Clearing System (NICS)
- DNB's settlement bank system

Norges Bank may grant exemptions from the licensing requirement for interbank systems considered to have no significant effect on financial stability. SpareBank 1 SMN's settlement bank system has been granted such an exemption.

Oversight

Norges Bank oversees financial market infrastructures (FMIs). Norges Bank's oversight is based on Section 1 of the Norges Bank Act and international principles for FMIs.[9] If in the course of its oversight activities, Norges Bank identifies any issues, Norges Bank will urge the FMI owners to rectify the deficiencies and, if necessary, take the matter up with the relevant supervisory authority.

Norges Bank oversees:
- Norges Bank's settlement system (NBO)
- SpareBank 1 SMN's settlement bank system
- The central securities depository Verdipapirsentralen's (VPS) register function and the Norwegian securities settlement system (VPO)
- The two central counterparties LCH and SIX x-clear

Norges Bank also participates in a committee of representatives of relevant central banks that oversee CLS Bank International (CLS), an international settlement bank for currency transactions. The oversight of CLS is led by the Federal Reserve.

The Payment Systems Act's provisions on interbank systems do not apply to Norges Bank's settlement system (NBO). The Bank oversees NBO. In accordance with international recommendations, the oversight and operation of NBO are handled by separate organisational units within the Bank. Following a decision in 2017, it has been clarified that the lines of defence in risk management do not form part of the oversight presented in this *Report* (see further discussion on page 24).

As Finanstilsynet's supervisory activities and Norges Bank's supervisory and oversight work overlap to a degree, the Bank liaises closely with Finanstilsynet. Table 3.1 provides an overview of the various FMIs. Retail systems for payment services are monitored by Finanstilsynet.

9 See CPMI-IOSCO (2012).

TABLE 3.1 Financial market infrastructures subject to supervision and oversight

System	Instrument	Operator	Supervision/ oversight	Administrative body
Norges Bank's settlement system (NBO)	Payments	Norges Bank	Oversight	Norges Bank
Norwegian Interbank Clearing System (NICS)	Payments	NICS Operations Office	Supervision and 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
Norwegian securities settlement system (VPO)	Securities	Verdipapirsentralen ASA (VPS)	Supervision and oversight	Supervision of VPS and VPO: Finanstilsynet Oversight of VPO: Norges Bank
VPS's central securities depository (CSD) function	Securities	VPS	Supervision and oversight	Supervision of CSD function: Finanstilsynet Oversight of CSD function: Norges Bank
SIX x-clear's central counterparty system	Financial instruments	SIX x-clear AG (SIX)	Supervision and oversight	Supervision of SIX: The Swiss and Norwegian financial supervisory authorities Oversight of SIX: Swiss National Bank and Norges Bank
LCH. Clearnet 's central counterparty system	Financial instruments	LCH	Supervision and oversight	Supervision of LCH: Bank of England Oversight of LCH: Global College (including Norges Bank) and EMIR College
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

The Payment Systems Act defines **payment systems** as interbank systems and systems for payment services. **Interbank systems** are systems for the transfer of funds between banks 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 that are authorised to provide payment services (cf. Section 1 of the Payment Systems Act).

Securities settlement systems are defined in the Payments Systems Act as systems based on common rules for clearing, settlement or transfer of financial instruments.

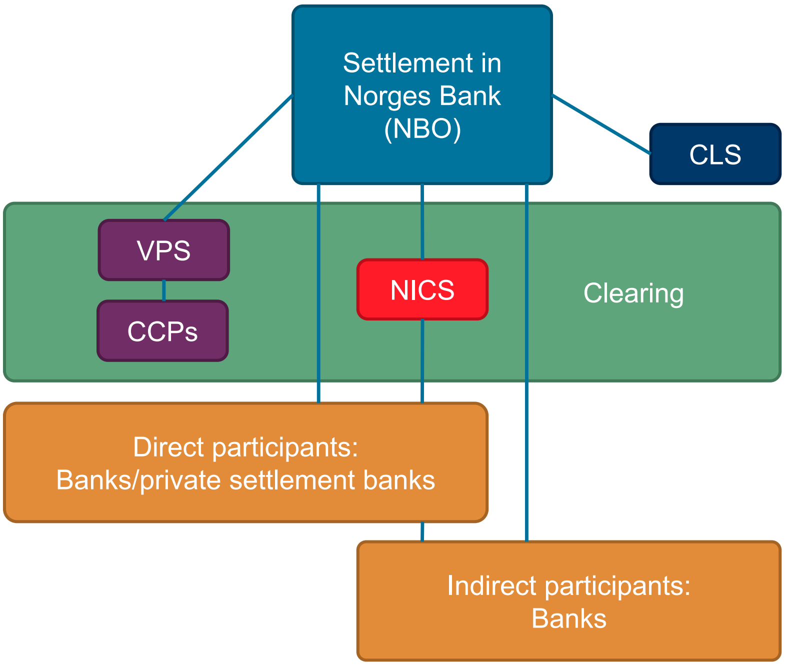
The IMF assessed Norway's FMIs and their supervision and oversight by Norges Bank and other authorities in 2015, and the Bank worked on following up the IMF's recommendations in 2016. For example, the Bank has communicated to some FMI owners that risk management in respect of outsourced operations needs to be improved.

Assessments according to international principles

Norges Bank evaluates the systems subject to supervision and oversight in accordance with international principles (see box on page 24).

The international principles have been drawn up by the Committee on Payments and Market Infrastructures (CPMI), which comprises representatives of central banks, and the International Organization of Securities Commissions (IOSCO).

CHART 3.1 Interbank and securities settlement systems in Norway1[1]



1 The chart has been simplified for reasons of clarity.

Source: Norges Bank

3.2 INTERBANK SYSTEMS

Interbank systems are systems for the transfer of funds between banks with common rules for clearing and settlement.

NORGES BANK'S SETTLEMENT SYSTEM

The system in brief

Norges Bank is the ultimate settlement bank in the Norwegian payment system. Settlement between banks and other institutions with an account at Norges Bank takes place in Norges Bank's settlement system (NBO). All payments in NOK are ultimately settled in NBO (Chart 3.1).

A bank must have an account with Norges Bank to participate directly in settlement in NBO. Around 130 banks, most of them Norwegian, have such an account.

Payments can be settled both gross and net in NBO. Gross settlement is the settlement of individual payments. These payments can be submitted for settlement throughout NBO's opening hours and are settled immediately. Net settlement is the settlement of positions cleared by NICS or VPS. In these clearings, large numbers of transactions are accumulated, and the net amount each individual bank owes to, or is owed by, other banks is calculated. Net settlements take place at set times during the day.

All banks with an account at Norges Bank may participate directly in gross settlements. At the end of 2016, 21 banks participated directly in the settlement of clearings from NICS and VPS. Other banks participated indirectly in net settlements via one of those 21 banks.

Norges Bank has purchased software for NBO from the Italian company SIA S.p.A. (SIA). The software was developed by the South African company Perago, a wholly-owned subsidiary of SIA. IT operations for the settlement system have been outsourced to EVRY Norge AS since 2003.

Oversight

During the year, oversight focused on areas previously identified as having room for improvement, namely the management and control of outsourced operations, regulatory compliance, internal division of responsibilities, and work on risk analyses.

Developments in the system

NBO's operation was stable during the year, without serious incidents.

There were no major changes to NBO during the year.

NORWEGIAN INTERBANK CLEARING SYSTEM

The system in brief

The Norwegian Interbank Clearing System (NICS) is the banks' joint system for clearing payment transactions. Nearly all payment transactions in Norway, including card transactions, are sent to NICS. Most of the transactions received by NICS are included in a multilateral clearing in which each bank's net position against all other banks is calculated. The clearing result is sent to Norges Bank's settlement system (NBO), where the net positions are settled. Clearings are settled five times daily each working day at 5.30 a.m., 9.30 a.m., 11.30 a.m., 1.30 p.m. and 3.30 p.m.

Banks also send transactions via NICS that are not included in a multilateral clearing. These transactions are settled one by one (gross) in NBO. Payments can be settled individually throughout NBO's opening hours, from 5.30 a.m. to 4.35 p.m. These are generally payments of more than NOK 25m.

The NICS Operations Office has outsourced the technical operation of NICS to Nets Norge Infrastruktur (NNI). NNI also uses other companies in the Nets group to carry out operational tasks.

Supervision

Norges Bank has received an application for the transfer of responsibility for operating NICS from the NICS Operations Office to Bits AS (Bits). The Bank has announced that it will probably agree to such a transfer, and that the terms of the licence will be revised at the same time. Bits is an infrastructure company formed by Finance Norway in 2016. The transfer of responsibility for operating NICS is intended to result in increased capacity and expertise enhancements for performing duties as system owner of NICS.

The transfer of responsibility for operating NICS has been among the topics discussed at recent supervisory meetings with the NICS Operations Office. The NICS Operations Office has also provided information on its work on risk and contingency planning, including the technical operator's opening of a new data centre which may help make the contingency solutions for NICS more robust.

Developments in the system

The technical operation of NICS was stable during the year. There were few disruptions, none of which were serious.

The number of daily clearings in NICS was increased from four to five from 13 October 2016. The new clearing takes place at 9.30 a.m. The clearing previously carried out at 11 a.m. has been pushed back to 11.30 a.m.

PRIVATE SETTLEMENT BANK SYSTEMS

The systems in brief

There are three private settlement banks in Norway that settle other banks' payments in NBO. DNB is the settlement bank for 94 banks, SpareBank 1 SMN for 11 banks and Danske Bank for one bank.

A private settlement bank takes over the positions of other banks after they are cleared in NICS and settles on their behalf in NBO. Following settlement at Norges Bank, the participant banks' settlement accounts are credited or debited at the private settlement bank. Direct participants in NBO are referred to as first-tier banks, while those participating through private settlement banks are referred to as second-tier banks.

These settlement bank systems are not separate technical systems, but are based on settlement banks' systems and procedures for exchanging other transactions.

The contractual framework for second-tier settlement has been laid down by the NICS Operations Office and forms part of the banks' joint rules for payment services. Some areas, such as commercial terms, are nevertheless agreed directly between the settlement bank and the second-tier banks.

Supervision and oversight

DNB has a licence from Norges Bank for its settlement system. The Bank holds regular semi-annual supervisory meetings with DNB concerning its settlement system. Additional meetings on specific issues are conducted as necessary. Topics at supervisory meetings during the year included testing contingency solutions, work on developing new operating solutions, and assessing critical service providers against international principles.

CPMI-IOSCO has drawn up five expectations for FMIs' critical service providers. DNB has conducted an assessment of whether its critical service providers – EVRY, Tata Consultancy Services and HCL Technologies – meet these expectations, and found that they do.

As SpareBank 1 SMN does not require a licence for its settlement system, the system is not subject to supervision by Norges Bank. The Bank nevertheless oversees its operation and holds regular meetings with SpareBank 1 SMN. Topics at these meetings include the operating situation, exercises carried out and any system changes.

Danske Bank's settlement system is too small to require oversight by Norges Bank.

Developments in the system

Operation of the DNB and SpareBank 1 SMN settlement bank systems was stable during the year, and there were no disruptions affecting the systems.

DNB and SpareBank 1 SMN test their settlement systems regularly. The most extensive test in 2016 involved DNB transferring the whole of its production to the backup site for one week. The transfer took place without any problems, and there was no disruption to production during the test.

Neither SpareBank 1 SMN nor DNB made any major changes to their settlement bank systems during the last year.

CONTINUOUS LINKED SETTLEMENT

The system in brief

CLS Bank International operates the world's largest multicurrency cash settlement system, settling payment instructions related to foreign exchange (FX) transactions in 18 currencies, including the Norwegian krone (NOK). Payment instructions are settled on a gross basis across settlement members' accounts on the books of CLS. CLS calculates funding as a net position for each settlement member in each currency. Ingoing and outgoing currency payments are transacted through CLS and members' accounts with the various central banks. A settlement member may use another bank (a nostro agent) to make and receive CLS-related payments.[10]

At year-end 2016, 66 banks were settlement members of CLS. DNB was the only Norwegian settlement member. Institutions that are not settlement members may use a settlement member to settle foreign exchange transactions in CLS on their behalf. At year-end 2016, 242 Norwegian institutions participated in this manner.

IBM provides CLS with operational services, as well as service management and support functions

Supervision and oversight

CLS is subject to both supervision and oversight. CLS is supervised by the Federal Reserve, while 23 central banks, including Norges Bank, cooperate on oversight of CLS via the CLS Oversight Committee (OC). The Federal Reserve chairs the OC. This cooperative oversight arrangement is based on recommendations in "Principles for Financial Market Infrastructures (PFMI)" (CPMI-IOSCO (2012) and "Central bank oversight of payment and settlement systems" (CPMI, 2005).[11]

CLS Bank has published a description of its approach to observing the PFMI in a disclosure framework.[12] The central banks participating in the oversight of CLS have been given the opportunity to comment on this. CLS updates this document every other year.

Developments in the system

There have been no incidents that affected settlement of NOK in CLS the last year.

CLS plans to reduce its intraday credit limits for those institutions that use correspondent banks to submit payments to CLS, in order to mitigate the risk of a liquidity shortfall.

10 See box on page 27 of Norges Bank (2015).
11 An oversight protocol consented to by the participating central banks describes how the OC is organised. See Federal Reserve (2015)
12 See CLS (2016)

3.3 SECURITIES SETTLEMENT

Verdipapirsentralen ASA (VPS) holds a licence as the Norwegian central securities depository (CSD). VPS is also operator of the Norwegian securities settlement system (VPO). In VPO, rights to securities are registered to VPS accounts, while the cash leg takes place at Norges Bank.

Equity transactions sent to VPO for settlement come from a number of trading venues and pass through several central counterparties (CCPs) (Chart 3.2). CCPs participate in VPO because they enter into equity trades on regulated trading venues, becoming the counterparty to both the buyer and the seller of the equities, a process known as clearing.

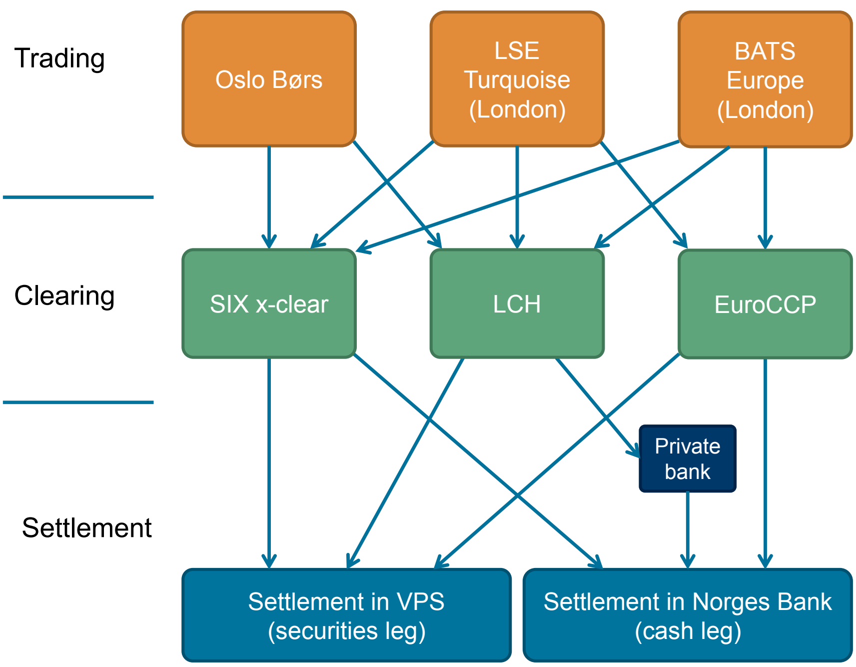
VPS SETTLEMENT SYSTEM

The system in brief

VPO performs settlement of equities, equity certificates and fixed income securities denominated in NOK. A total of 36 market participants (investment firms, banks and CCPs) participate directly in VPS. Of these, 20 also participate directly in the cash leg of settlement at Norges Bank. Participants in settlement at Norges Bank are banks and CCPs. There are also a number of indirect participants.

The CCPs calculate a net equity position and a net cash position for each participant and send these positions to VPS. As a result of this netting, fewer transactions are sent for settlement. Trades in NOK

CHART 3.2 Trading, clearing and settlement of equities in NOK



Source: Norges Bank

bonds are not cleared by CCPs but sent directly to VPS by investment firms.

VPO settlement takes place twice a day, at 6 a.m. and 12 noon. In 2016, 72% of transactions by volume were settled in the early morning settlement. VPO settlement is a multilateral net settlement. Before each settlement, VPS calculates a cash position for each of the 20 participants in the cash leg. These cash positions are settled through the participants' VPO settlement accounts at Norges Bank. Since there are two settlements daily, a maximum of 40 cash transactions take place each day. Once the cash leg is complete, the rights to the securities are registered to VPS accounts. These rights are registered individually (gross). In 2016, there was an average of 48 000 such transactions in VPS per day. There were around 1.2m VPS accounts at the end of the year.

VPS does not outsource the operation of its systems.[13]

Oversight

Norges Bank oversees VPO and VPS, while Finanstilsynet supervises VPS, including VPS's settlement operation. The Bank holds semi-annual oversight meetings with VPS, with Finanstilsynet invited as observer. Additional meetings on specific issues are conducted as necessary. In 2016, Norges Bank's oversight activities focused on VPS's preparations for the EU's new Central Securities Depositories Regulation (CSDR) (see box on page 20).

Developments in the system

There were few disruptions during the year, and none were serious.

The standard procedure for securities trades on registered trading venues is settlement after two days. Some trades are not settled on the agreed date, generally because one party has insufficient funds. In 2016, 96.4% of transactions and 91.5% of the value of settlements in VPO were settled on the agreed date. Most transactions not settled on the agreed date are settled a day or two later. Only a couple of tenths of a percent are cancelled. VPS offers participants a number of services to help improve this ratio.

VPS launched a modernisation programme in 2015, covering IT systems, organisation, skills and market practices. This programme is to be carried out over the period 2016–2018 and involves, among other issues, adjustment to new EU rules (the Central Securities Depositories Regulation (CSDR)). To comply with the CSDR, VPS must apply to the Norwegian authorities for a new authorisation for its activities and make major changes to its services and operations. Among other things, VPS intends to increase the number of settlements per day from two to three. The plan is to introduce the third daily settlement by 2018 Q2.

VPS is looking into whether new decentralised technology could simplify cross-border collateral transfer. Together with three other CSDs and Deutsche Börse, VPS developed a prototype solution in spring 2017.

13 This has to do with the conditions set by the Ministry of Finance 8 November 2007 when approving the merger of Oslo Børs Holding ASA and Verdipapirsentralen Holding ASA.

New rules for securities settlement and central securities depositories

The EU adopted the Central Securities Depositories Regulation (CSDR) in 2014. Central securities depositories (CSDs) play a key role in the issuance, settlement, safekeeping and collateral management of financial instruments. They are therefore critical institutions for securities markets. The aim of the regulation is to promote secure and efficient CSDs and securities settlement systems in the EU.

Under the CSDR, European CSDs must apply to the competent authority in their home country for a new authorisation, which then entitles the CSD to offer services throughout the EU. This opens the door to competition between CSDs.

In parallel with the development of the CSDR, the European Central Bank developed a technical platform for securities settlement called TARGET2-Securities (T2S). T2S is a joint IT platform that CSDs and central banks can use for settling securities. It is now used by 18 CSDs.

Implementation in Norway

On behalf of the Ministry of Finance, Finanstilsynet assembled a task force in autumn 2015 to prepare for the implementation of the CSDR in Norway. The task force was led by Finanstilsynet and included participants from Norges Bank, VPS, Finance Norway, the Norwegian Securities Dealers Association, the Ministry of Finance and the Ministry of Trade, Industry and Fisheries. The task force proposed a new Central Securities Depositories Act. Securities settlement is little regulated by Norwegian law at present. The implementation of the CSDR in Norwegian law requires changes to the Norwegian securities settlement system (VPO). The CSDR will also entail more extensive regulation of Verdipapirsentralen ASA (VPS), which is the only authorised CSD in Norway.[1]

The Ministry of Finance circulated the task force's report for consultation with a closing date of 8 February 2017. In its response, Norges Bank argued that the law should not permit financial instruments to be registered in foreign CSDs to a greater extent than set out in the CSDR, such that the current Norwegian legal protection can be retained as far as possible. The Bank also called for retention of the current rules that Norwegian shareholders in Norwegian companies must register their shares in CSD accounts in the name of the investor.[2]

New roles for Norges Bank

Under the task force's proposals, the Ministry of Finance will decide on the application from VPS for CSDR authorisation and any applications to offer ancillary

1 The EU introduced additional rules supplementing the CSDR on 30 March 2017 (see *Official Journal of the European Union*, L65, 10 March 2017).

2 Norges Bank's letter to the Ministry of Finance of 30 January 2017.

banking services or perform certain types of outsourcing. Finanstilsynet will be tasked with considering the applications and conducting supervision. When assessing such applications from VPS, Finanstilsynet must consult Norges Bank. To obtain CSDR authorisation, a number of requirements must be met in relation to organisational arrangements, conduct of business, design of services, prudential operation and resolution planning.

Finanstilsynet will be required to conduct an assessment of risk at VPS at least once a year, reviewing the strategies, arrangements, processes and mechanisms that VPS has introduced to comply with the CSDR. Norges Bank must be consulted in this review. So that the requirements in the CSDR are consistent with the principles in CPMI-IOSCO (2012), consideration will be given to whether the annual CSDR review can replace the current assessment of VPS against the CPMI-IOSCO principles.

Norges Bank will also work with Finanstilsynet on ensuring that the Norwegian securities settlement system (VPO) complies with the CSDR's rules on settlement discipline. These rules are intended to encourage participants in settlement to have sufficient funds so that more trades are settled on the agreed date. Under the CSDR, participants with insufficient funds will be subject to penalties or other actions.

Norges Bank does not currently oversee any CSDs other than VPS, but this may change under the CSDR:

- New operators may apply to the Norwegian authorities for CSDR authorisation to set up a CSD in Norway. The same procedures as described above for VPS will apply to any such new Norwegian CSDs. Norges Bank will thus oversee them in the same way as it oversees VPS.

- If foreign CSDs with CSDR authorisation wish to settle in NOK above certain thresholds, Norges Bank must collaborate with the relevant foreign authorities on oversight.

CENTRAL COUNTERPARTY SYSTEMS

The systems in brief

Central counterparties (CCPs) enter into transactions between buyers and sellers of financial instruments and guarantee that the contracts are fulfilled (clearing). The original parties to the trade are then no longer exposed to counterparty risk. CCPs can make an important contribution to financial stability in periods of market turmoil.

Norwegian market participants' trades in financial instruments are cleared through various CCPs. Equity trades on Oslo Børs are cleared by the Swiss CCP SIX x-clear and the UK CCP LCH. Trading in OTC interest rate derivatives is cleared by LCH.

A number of trading venues, including Oslo Børs, have made the use of CCPs mandatory for trading in equities. The European Market Infrastructure Regulation (EMIR), which makes clearing mandatory for some OTC derivatives, is planned to be implemented in Norwegian law in 2017 Q2. Norwegian market participants must then settle certain OTC interest rate derivatives through CCPs (see box on page 22).

Supervision and oversight

No CCPs are headquartered in Norway. Norges Bank does not therefore have lead responsibility for overseeing any CCPs but participates in various collaborative arrangements with authorities in other countries (see box on page 23).

The collaborative arrangements for the oversight and supervision of CCPs aim to ensure that CCPs comply with the CPMI-IOSCO principles and EMIR.

CLEARING OBLIGATION FOR NORWEGIAN INTEREST RATE DERIVATIVES

EMIR (2012) requires trading in suitable OTC derivatives to be cleared by a central counterparty. Which OTC derivatives are considered suitable is set out in supplementary regulations. A regulation dated 10 June 2016 introduced a clearing obligation for certain types of interest rate derivatives in NOK:

- Interest rate swaps (IRSs) from a fixed to a floating rate, with NIBOR as reference rate, NOK as settlement currency, maturity between 28 days and 10 years, constant or variable principal
- Forward rate agreements (FRAs) with NIBOR as reference rate, NOK as settlement currency, maturity between three days and two years, constant or variable principal

EMIR was incorporated into the EEA Agreement on 30 September 2016, and the Ministry of Finance has announced that the rules implementing EMIR in Norwegian law will enter into force in 2017 Q2.

The clearing obligation will apply to Norwegian market participants once EMIR has been implemented in Norwegian law. The obligation will initially apply only to the largest participants, giving smaller participants more time to adjust to the change.

The CPMI-IOSCO principles require FMIs to have recovery plans. In 2014, CPMI-IOSCO published a report with more detailed recommendations on the design of such plans. CCPs' recovery plans must, for example, show how they will continue to provide services even during major crises. CCPs take on financial risk and can be exposed to heavy losses and they are required to prepare plans showing, among other things, how they can continue operating in the event of such losses.

Should the actions in these recovery plans not be sufficient to ensure continued operation of a CCP, the resolution authority will take over the management of the CCP. On 28 November 2016, the European Commission published a draft regulation on the recovery and resolution of CCPs. It proposes giving the CCP's home state authority responsibility for preparing recovery and resolution plans in conjunction with the authorities in other countries in which the CCP has operations. The Financial Stability Board (FSB) has also sent its proposed new guidance on CCP resolution and resolution planning out for consultation.[14] Norges Bank submitted its response on 20 March 2017.

Developments in the systems

CCPs make constant adjustments to reduce the risk in their systems, increase efficiency and offer new services. For example, SIX x-clear began clearing equity trades on the NASDAQ exchanges in Sweden, Denmark and Finland in February 2017.

14 Financial Stability Board (2017).

CENTRAL COUNTERPARTIES – NORGES BANK'S COLLABORATION WITH AUTHORITIES IN OTHER COUNTRIES

Norges Bank and Finanstilsynet participate in the colleges set up by the Dutch and UK authorities to monitor and supervise EuroCCP and LCH, respectively. In the case of SIX x-clear, Norges Bank and Finanstilsynet have signed a collaboration agreement with the Swiss authorities on oversight and supervision. These arrangements give the Bank access to information on LCH, EuroCCP and SIX x-clear, and the Bank regularly takes part in meetings where issues relating to oversight and supervision are discussed.

Equity trades on a particular trading venue will often be cleared by more than one CCP. Solutions have been developed so that two parties can trade with one another even if they participate through different CCPs. The disadvantage of this is that large exposures can accumulate between CCPs. Finanstilsynet and Norges Bank are members of a task force alongside representatives of the Swiss, Dutch and UK authorities that is discussing issues relating to links between CCPs. The task force is focusing on whether the three CCPs (LCH, SIX x-clear and EuroCCP) have adequate solutions for handling such exposures.

Norges Bank is also participating in a task force on CCPs under the European Systemic Risk Board (ESRB). This task force is focusing on analysing the risk associated with CCPs. It is participating in the assessment of EMIR, working on issues relating to contingency plans for CCPs, and analysing and monitoring risks at CCPs using indicators. In addition, Norges Bank is participating in subcommittees performing quantitative analyses of the network of OTC derivatives in Europe using trade repository data. Through this work, the Bank can help analyse the risk associated with OTC derivatives and also contribute to regulation in this area.

Assessment of Norwegian financial market infrastructures against international principles

Norges Bank assesses Norwegian financial market infrastructures (FMIs) against international principles (see Table 1).[1] These principles have been drawn up by the Committee on Payments and Market Infrastructures (CPMI), a committee comprising representatives of central banks, and the International Organization of Securities Commissions (IOSCO). The aim of the principles is to ensure a robust financial infrastructure that promotes financial stability. The principles provide a comprehensive standard for financial infrastructure across borders and system types.

The owners of Norwegian FMIs carried out a self-assessment against the principles in 2014. On the basis of this self-assessment and other information, Norges Bank assessed the systems in 2014. Since that time, Norges Bank has performed annual reassessments of FMIs against principles not assessed as "observed", as well as against a number of other principles as needed. The assessments of the securities settlement system (VPO) and VPS's CSD function were carried out in conjunction with Finanstilsynet. The main conclusion of the assessments by Norges Bank and Finanstilsynet is that Norwegian FMIs largely comply with the CPMI-IOSCO principles.

FMIs are assessed against the principles that are relevant to them. The degree of compliance is based on the following criteria:

- Observed: The FMI observes the principle. Any shortcomings are minor.
- Broadly observed: The FMI broadly observes the principle. The system has one or more shortcomings that give cause for concern. The FMI should follow up on these shortcomings by a specified date.
- Partly observed: The FMI partly observes the principle. The system has one or more shortcomings that could become serious if not addressed promptly. The FMI must give high priority to addressing these shortcomings.
- Not observed: The FMI does not observe the principle. The system has one or more serious shortcomings that warrant immediate action.
- Not applicable. The principle does not apply to the FMI.

Norges Bank urges the owner of the FMI to rectify uncovered shortcomings. With regard to VPS, Norges Bank follows up compliance together with Finanstilsynet. Norges Bank may require that FMIs subject to supervision comply with the principles, but for the time being has not required compliance with these principles under FMIs' licence terms.

1 See CPMI-IOSCO (2012).

TABLE 1 Assessment of Norwegian FMIs against international principles. Years denote most recent assessment

Principle/type of FMI	NBO	NICS	VPO	VPS's CSD function	DNB (private settlement bank)	SMN (private settlement bank)
1. Legal basis	2014	2014	2017	2014	2014	2014
2. Governance		2017[1]	2014	2014	2014	2014
3. Framework for the comprehensive management of risks		2015	2017	2017	2014	2014
4. Credit risk	2014		2014		2014	2014
5. Collateral	2014					
6. Margin						
7. Liquidity risk	2014	2014	2014		2014	2014
8. Settlement finality	2014	2014	2014		2014	2014
9. Money settlements	2014	2014	2014		2014	2014
10. Physical deliveries						
11. Central securities depositories				2014		
12. Exchange-of-value settlement systems	2014		2014			
13. Participant-default rules and procedures	2014	2014	2017	2014	2014	2014
14. Segregation and portability						
15. General business risk	2014	2014	2017	2017	2014	2014
16. Custody and investment risks			2014	2014	2014	2014
17. Operational risk	2017[2]	2017	2014	2014	2014	2014
18. Access and participation requirements	2014	2014	2014	2014	2014	2014
19. Tiered participation arrangements	2014		2017	2014		
20. FMI links			2014	2017		
21. Efficiency and effectiveness	2014	2014	2014	2014	2014	2014
22. Communication procedures and standards	2014	2014	2014	2014		
23. Disclosure of rules, key procedures and market data	2014	2014	2014	2014	2014	2014
24. Disclosure of market data by trade repositories						

Explanation:
Observed · Broadly observed · Partly observed · Not observed · Not applicable · Outside scope of oversight[3]

1 Assuming the transfer of operational responsibility from the NICS Operations Office to Bits AS (see discussion on page 26).
2 Some of the main requirements of the principle have not been assessed (see discussion of Norges Bank's oversight of NBO on page 26).
3 See discussion of Norges Bank's oversight of NBO on page 26.

Details of the assessments performed in 2017

NBO

Norges Bank has an integrated and comprehensive risk management structure set out in principles, guidelines and frameworks. Risk management in NBO is included in its entirety in general risk management at Norges Bank Central Banking Operations. Following a decision in 2017, it has been clarified that the lines of defence in risk management[2] do not form part of the oversight presented in this report. One consequence of this is that Principle 2 (governance), Principle 3 (risk management framework) and some of the key considerations in Principle 17 (operational risk) are no longer assessed by the unit at Norges Bank that oversees NBO.[3]

Principle 17 (operational risk) was considered broadly observed in 2016 on account of weaknesses in the follow-up of critical service providers. NBO received risk analyses from its service providers in 2016. These are integrated into Norges Bank's own risk analyses. This principle is now considered to be observed.

NICS

Principle 2 (governance) was considered broadly observed in 2015. Norges Bank found that the NICS Operations Office should appoint a board member who is neither employed by, nor in some other way closely linked to, the financial sector. Norges Bank has received an application for the transfer of responsibility for operating NICS from the NICS Operations Office to Bits AS (Bits). The Bank has announced that it will probably agree to such a transfer, and that the terms of the licence will be revised. The board of Bits includes an independent member. Assuming that operational responsibility is transferred to Bits, Norges Bank considers Principle 2 to be observed.

2 Norges Bank's overarching risk and compliance function and internal control (so-called second and third lines).

3 The system owner for NBO has published a self-assessment against the principles from CPMI-IOSCO, see Norges Bank (2017).

Principle 17 (operational risk) was considered broadly observed in 2016. The shortcomings, which related to contingency solutions, are now being followed up by the FMI owner and the technical operator. For the time being, Norges Bank considers the principle to be broadly observed.

VPO

Principle 1 (legal basis) and Principle 13 (participant default rules and procedures) are considered broadly observed because VPS's rules for handling a participant's bankruptcy are unclear. VPS agreements must be read in conjunction with the agreements used by Norges Bank in order for the rules to be clear. Together with Norges Bank, VPS has begun work on clarifying the rules in line with a new regulation from the Ministry of Finance.

Principle 3 (risk management framework) and Principle 15 (general business risk) contain requirements for a recovery plan in the event of financial problems. VPS will complete such a plan before it applies for CSDR authorisation. Until the plan is completed, these two principles are still considered broadly observed.

Principle 19 (tiered participation arrangements) is still considered broadly observed. There are shortcomings in quantitative analyses and systematic risk assessment of indirect participants.

VPS's CSD function

Principle 3 (risk management framework) and Principle 15 (general business risk) apply to both VPO and VPS. For the same reason as cited for VPO above, VPS broadly observes these principles.

In addition, VPS does not fully comply with Principle 20 (FMI links), because VPS does not conduct its own assessment of links where securities registered in a foreign CSD are partly registered in VPS. VPS will meet this requirement before applying for CSDR authorisation.

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Annex[1]

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	2014	2015	2016
NICS																
NICS Gross	303	300	596	611	532	547	593	605	524	568	548	594	659	624	772	980
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	8.7	9.1	9.5
NBO																
Total number of transactions									1 165	1 146	1 138	1 274	1 406	1 367	1 565	1 835
RTGS Gross transactions excl. NICS									463	477	479	549	595	592	658	700

1 Phased out in June 2010.
2 Previous NICS Retail and NICS SWIFT Net payments below NOK 25m are 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 figures under NICS are from the NICS Operations Office. The figures under NBO are from Norges Bank

1 For tables showing developments in retail payment services, see *Norges Bank Papers* 2/2017.

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	2014	2015	2016
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	262.8	285.9	284.1
NICS Gross	151.2	149.5	187.8	129.4	135.5	155.3	176.8	165.9	124.1	107.2	119.1	138.6	136.0	140.9	160.1	158.7
NICS SWIFT Net[1]	16.1	16.2	12.6	5.2	5.7	6.7	7.6	7.3	6.1	-	-	-	-	-	-	-
NICS Net[2]	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	121.9	125.8	125.4
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**	**198.0**	**219.3**	**221.2**
NICS Gross	150.7	149.5	187.7	128.9	135.5	155.3	180.2	163.9	113.2	106.3	119.0	137.7	135.2	140.8	157.5	156.1
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	42.5	46.0	49.0
NICS SWIFT Net[1]	5.3	5.5	2.1	1.0	0.9	1.0	1.2	1.1	0.9	1.1	-	-	-	-	-	-
NICS Net[2]	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	10.8	11.9	12.4
VPO and Oslo Clearing[4]	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	3.9	3.8	3.7
VPO						4.4	5.1	4.9	4.4	5.2	4.5	4.4	4.2	3.9	3.8	3.6
Oslo Clearing						0.3	0.4	0.3	0.1	0.1	0.1	0.0	0.0	0.1	-	0.0

1 Phased out in June 2010.
2 Previous NICS Retail and NICS SWIFT Net payments below NOK 25m are 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.
4 From May 2015, legally integrated with SIX x-clear.
5 See note 4.

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

Table 3: Number of participants in clearing and settlement systems (at year-end)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Norges Bank's settlement system (NBO): Banks with account in Norges Bank	**145**	**142**	**143**	**140**	**134**	**129**	**130**	**128**	**131**	**129**	**130**
Norges Bank's settlement system (NBO): Banks with retail net settlement in Norges Bank	23	23	22	21	21	21	22	22	21	22	22
DNB	104	103	103	106	105	103	98	98	97	94	94
SpareBank 1 Midt-Norge	17	18	16	16	13	12	11	11	11	11	11
Norwegian Interbank Clearing System (NICS)	146	146	143	145	142	138	132	131	130	128	128

Source: Norges Bank

NORGES BANK
Bankplassen 2, P.O. Box 1179 Sentrum, N-0107 Oslo
www.norges-bank.no