

# Payment systems – a potential source of risk. The need for oversight and supervision

Harald Haare, senior adviser, and Inger-Johanne Sletner, director, Payment Systems Department, Norges Bank

Since the early 1990s, there has been increased attention on the risk banks incur through their role in the payment system. The primary focus has not been on the individual bank's risk exposure but on the possibility of problems spreading from one bank to another through the payment system. This type of domino effect is called systemic risk and can at worst threaten financial stability. Central banks oversee the payment system in order to limit this risk. This article explains the concepts oversight and supervision as well as the performance of Norges Bank's tasks in this area.

## 1. Introduction

On an ordinary day, the Norwegian payment system processes more than three million payment transactions. On some days, for example the last days before Christmas, the number of transactions can be far higher. The average value of all transactions is approximately NOK 300 billion per day. This means that in less than one week, turnover in the Norwegian payment system is comparable to mainland GDP.

Most payment transactions are between individuals and public or private enterprises. For example, when an individual pays rent by credit transfer or purchases goods by payment card, the transaction will result in an obligation for the payer's bank to withdraw the amount from the payer's account and transfer it to the payee's bank, which in turn must credit the same amount to the payee's bank account. Therefore, an ordinary payment transaction results in a settlement between the payer's and payee's banks. This is accomplished by debiting and crediting the two banks' accounts in a settlement bank.

Most retail payments involve small amounts and it is not efficient to send these transactions individually to settlement. Instead, they are totalled and netted in a clearing house. The clearing house calculates the result of all payments to and from customers in the participating banks. The result is a sum per bank either a net obligation or a net receivable from all the other banks. The individual banks or their data processing centres send payment information to the Norwegian Interbank Clearing System (NICS) which is responsible for netting. NICS has subcontracted this operation to the processing centre BBS (Banking and Business Solutions). The netting result is then sent to the settlement bank. In Norway, retail payments of this kind are settled twice daily, in the morning and in the afternoon.

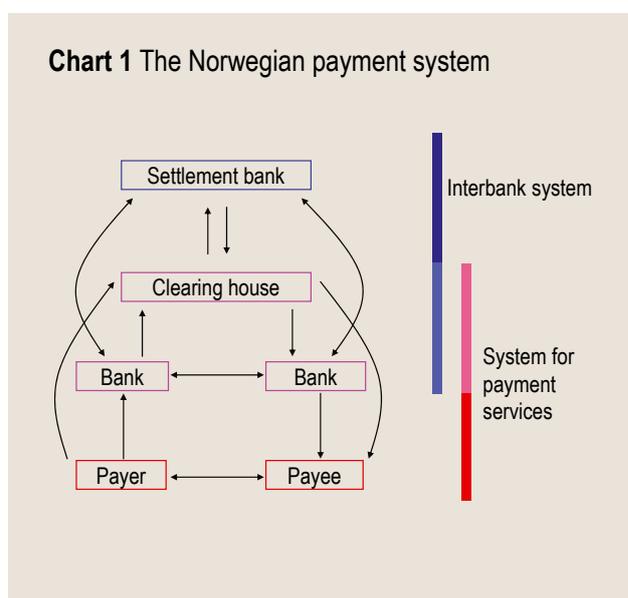
If netting results are to be settled, all participating banks must have cover in their accounts at the settlement bank, either in the form of deposits or drawing rights. The settlement will not be completed as expected

if there is insufficient cover. Because the settlement comprises many individual transactions between many banks, insufficient cover at one bank will have consequences for all other participating banks. If a bank expects to receive a substantial amount in the settlement, and it fails to be settled, the impact on the bank's liquidity could be considerable. This liquidity shortage can also spill over to other banks, which in turn expected to receive liquidity from the bank that did not receive settlement.

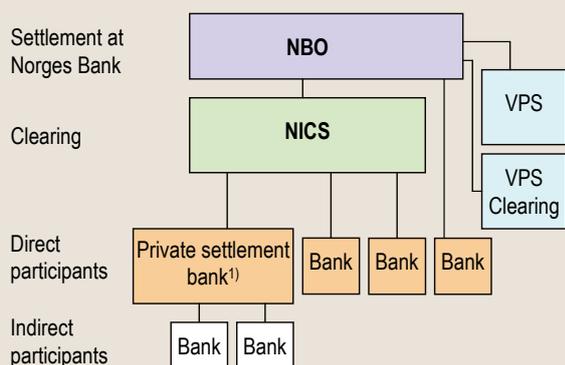
In order to reduce the risk of such spillover effects due to a failure to settle, the largest transactions will not be included in this type of netting but will be sent individually to settlement. The large-value transactions may for example relate to securities or foreign exchange transactions between financial institutions.

Norges Bank is the most important settlement bank in terms of the total amount settled. The majority of banks do not settle their transactions directly at Norges Bank but use private settlement banks. The most important of these is DnB NOR Bank ASA, which operates an authorised system and acts as the settlement bank

Chart 1 The Norwegian payment system



**Chart 2** Interbank systems in Norge



<sup>1)</sup> Private settlement banks are banks that settle transactions on behalf of indirect participants.

for more than 100 small and medium-sized banks. Sparebank 1 Midt-Norge provides settlement services for almost 20 savings banks. Total obligations and receivables from each of these settlement banks and from the banks whose transactions they settle are sent to NICS for netting and subsequent settlement at Norges Bank. The participating banks receive settlement from the private settlement bank after final settlement at Norges Bank.

Systems for clearing and settlement of interbank payment transactions are called interbank systems. The customer-oriented part of the payment system is called the system for payment services (see Chart 1).

In addition to the transactions from NICS, Norges Bank receives netted transactions from the securities settlement at the Norwegian Central Securities Depository (VPS) and from the financial derivatives settlement at VPS Clearing ASA (see Chart 2). Banks can send individual transactions to Norges Bank directly or via NICS.

In their quest for customers, banks have strong incentives to offer safe, swift and user-friendly payment solutions at a reasonable price. Such solutions also benefit the economy as a whole. Problems at one bank can spill over to other banks through the payment system. Individual banks do not have the same incentives to cover the costs of limiting systemic risk. This is an important reason for central bank oversight of the payment systems. Because the payment system plays a very important role in the economy, it is essential that interbank systems are operative even if one or more participating banks encounter problems. Central bank oversight will place emphasis on identifying and containing systemic risk in the interbank systems.

## 2. Norges Bank and payment systems in Norway

Norges Bank has played a key role in the payment system since the Bank was established in 1816. In the early years, Norges Bank provided ordinary banking services such as payment services in addition to its primary function of issuing banknotes and coins. The number of private banks increased sharply in the course of the 1800s. On the one hand, this meant that it became less relevant for Norges Bank to offer banking services to the corporate and household sectors, while on the other hand there was a need for clearing and settlement of interbank balances. Kristiania Bankavregningskontor (a clearing house) was established in 1898 to clear outstanding balances of cheques and money orders. The amount to be cleared was settled over an account held at Norges Bank. The main features of this solution survived for many years, but since the 1960s these processes have been automated to a large extent and have gradually replaced the old solutions. The current system for central bank settlement was established in the 1990s.

The Norges Bank Act of 1985 states that the Bank shall "...promote an efficient payment system domestically as well as vis-à-vis other countries..." On the basis of this, Norges Bank has worked to promote efficiency both in the interbank system and in the customer-oriented parts of the payment system. The systems have been designed under the auspices of the banking industry. Norges Bank has supported the banks' work on implementing a common infrastructure that facilitates the settlement of payment transactions between customers of all banks. As part of its work on promoting efficiency in the Norwegian payment system, Norges Bank has gathered statistics and other information on developments in the payment system since 1987. The results and assessments have been published in *Annual Report on Payment Systems* (Norges Bank 2006, Norges Bank 2007).

Under the Payment Systems Act of 1999, Norges Bank has responsibility for authorising and supervising banks' clearing and settlement systems, i.e. Norwegian interbank systems. The object of the Act is "to ensure that interbank systems are organised in such a way as to ensure financial stability." Norges Bank defines financial stability as follows:

"Financial stability implies that the financial system is robust to disturbances in the economy and is capable of channelling capital, executing payments and redistributing risk in a satisfactory manner."

An interbank system cannot be established or operated without authorisation from Norges Bank. However, interbank systems may be exempted from the authorisation requirement if Norges Bank finds that their opera-

tions are so limited in scope that they have no significant effect on financial stability. The general background material for the Payment Systems Act makes it clear that the Act is a supplement to and not a replacement of the industry's own regulation of the systems.

### 3. Oversight and supervisory activities<sup>1</sup>

The Payment Systems Act states that an interbank system shall have an operator that is responsible for its establishment and operation. Norges Bank may stipulate more detailed requirements for the systems. The application for system authorisation must contain information on ownership, participants, criteria for participation, measures to safeguard technical operations and measures to limit systemic risk resulting from liquidity and solvency problems among system participants or members.

The Act uses the term "supervision" to describe Norges Bank's follow-up of authorised systems. According to the Act, Norges Bank may require that the system operator provides information. If the system is not organised or operated in accordance with the provisions set out in or pursuant to legislation, Norges Bank may instruct the operator to implement measures to remedy the situation. Supervision shall ensure that the systems fulfil the purpose of the Act. Therefore, Norges Bank has a statutory duty to supervise the systems and to require changes that are deemed necessary to fulfil the purpose of the Act. Thus, Norges Bank exercises supervision within defined limits and formal requirements.

Authorised operators shall notify Norges Bank before making changes with respect to ownership, organisation or operations. Changes may be implemented without further delay unless otherwise decided by Norges Bank within two months after notification has been received. Norges Bank may stipulate more detailed rules about which changes require notification.

"Oversight" is a term that usually refers to the activity performed by most central banks in relation to payment and settlement systems. Oversight is broader in scope than supervision and is less precise than the Payment Systems Act's concept of supervision. Oversight has no legal basis in the Payment Systems Act and is based on cooperation with the system proprietors.

Oversight varies from one central bank to another. The report "Central bank oversight of payment and settlement systems" (BIS 2005) recommends that central banks base their oversight on the "Core Principles for Systemically Important Payment Systems" (BIS 2001) (see Box 1). The report was prepared by the Committee on Payment and Settlement Systems (CPSS). The committee comprises representatives from G10 central banks. The Bank for International Settlements (BIS) serves as secretariat to the committee and is respon-

sible for publishing the committee's reports. In cooperation with the International Organization of Securities Commissions, the committee has also prepared recommendations for securities settlement and central counterparty settlements (BIS/IOSCO 2001, 2004).

NICS Operatørkontor<sup>2</sup> and DnB NOR Bank ASA have the only authorised systems that are subject to supervision pursuant to the Payment Systems Act. Norges Bank, however, oversees the entire Norwegian payment system. This includes authorised systems, systems that are exempted from the authorisation requirement and systems that fall outside the provisions of the Payment Systems Act. Knowledge of how the different systems function, both individually and in relation to other systems, and whether they can pose a threat to financial stability in a crisis situation is essential to oversight.

Norges Bank's own settlement system, NBO, is the largest and most important system that is subject to oversight.<sup>3</sup> This is in line with normal practice at other central banks. Norges Bank has established internal reporting routines to ensure that the department responsible for oversight of NBO has an independent position in relation to the department that is responsible for operating NBO.

Oversight also covers the cash leg of securities settlements at the Norwegian Central Securities Depository as well as the settlement of financial derivatives through VPS Clearing ASA. Sparebank 1 Midt-Norge and EDB Business Partner ASA<sup>4</sup> operate interbank systems according to the Payment Systems Act, but they are exempted from authorisation because the systems are limited in size. However, due to their link to the rest of the payment system they will be subject to Norges Bank's oversight.

Settlement of freight derivatives through NOS Clearing ASA and settlement of energy derivatives at Nord Pool ASA have a special position. While financial derivatives diversify risk in financial markets, freight and energy derivatives are aimed primarily at diversifying risk in commodity markets. Whereas financial derivatives are settled at Norges Bank, commodity derivatives are settled at private banks, partly outside Norway and in foreign currency. They are of limited importance to financial stability, but it is conceivable in certain situations that an individual bank's positions can have a spillover effect on the payment systems. Therefore, Norges Bank has established a dialog with these two institutions to keep abreast of their activities.

Continuous Linked Settlement (CLS) is a system for the settlement of foreign exchange transactions (Andersen and Bakke, 2004). CLS was established by the international banking industry. The purpose of CLS is to remove credit risk linked to foreign exchange transactions. Norges Bank, in cooperation with the Norwegian banking industry, has provided for the inclusion of NOK in CLS, which has an account at

<sup>1</sup> See *Economic Bulletin* 1/02: "Norges Bank's oversight and supervision of the payment system"

<sup>2</sup> NICS Operatørkontor was established by the Norwegian Financial Services Association and the Norwegian Savings Banks Association.

<sup>3</sup> Norges Bank's own operations in this area are exempted from the provisions of the Payment Systems Act.

<sup>4</sup> EDB Business Partner ASA provides system solutions for settlement banks.

Norges Bank and is thus a participant in the Norwegian payment system. Norges Bank, together with the other central banks whose currencies are included in the CLS system, participates in the oversight of CLS. CLS Bank headquarters are in New York. Hence, the Federal Reserve Bank of New York leads the central banks' coordinated oversight.

SWIFT (The Society for Worldwide Interbank Financial Telecommunication) provides messaging services to financial institutions worldwide and thus constitutes an important part of the financial infrastructure both nationally and internationally. SWIFT has its head office in Belgium and the Belgian central bank oversees the system together with the G10 group in the BIS. The oversight work focuses on safety, operational stability, vulnerability and contingency arrangements. Norges Bank does not exercise oversight of SWIFT's activities in Norway.

The BIS report of 2005 looks at three key activities of oversight (BIS 2005):

- Monitoring
- Assessment
- Inducing change

Norges Bank also uses these categories in its supervision activities.

### *Monitoring*

Norges Bank gathers information from authorised systems and from Norges Bank's Settlement System (NBO) through meetings with the operators and from operators' reports. Such reports are prepared four to five times yearly and describe among other things deviations, e.g. information about the reasons for and consequences of deviations. Information on the results of vulnerability analyses, system tests and contingency exercises and measures is an important aspect of the reporting.

Oversight of systems that are not authorised pursuant to the Payment Systems Act is also based on reports from and meetings with operators. The formal reporting requirements are not as strict, however, as the requirements pertaining to authorised systems.

### *Assessment*

Norges Bank will stay abreast of the functioning of the interbank systems by gathering information from the operators. On the basis of this information, the Bank will acquire an overview of risk and efficiency in the interbank system and decide which aspects should be followed up more closely. The information will also provide a basis for assessing whether the system satisfies relevant international recommendations, and – for systems that fall within the scope of supervi-

## Box 1: Core principles for systemically important payment systems (BIS 2001)

1. The system should have a well-founded legal basis under all relevant jurisdictions.
2. The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.
3. The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.
4. The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.
5. A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.
6. Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.
7. The system should ensure a high degree of security and operational reliability and should have contingency arrangements for the timely completion of daily processing.
8. The system should provide a means of making payments which is practical for its users and efficient for the economy.
9. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.
10. The system's governance arrangements should be effective, accountable and transparent.

sion – whether they comply with the provisions of the Payment Systems Act and the terms of authorisation.

A difficult question is how far Norges Bank should go in its efforts to gather information on system details. In general, this will depend on which issues are to be assessed. The scope of oversight must be adapted to the system's importance to financial stability. Oversight includes assessment of system design, system compliance with the legal framework, routines, operating procedures and operating environment. The purpose of the work will be to identify risk factors. It is the operator,

however, that is responsible for establishing the system and ensuring that it is operated in a manner that does not threaten financial stability. Norges Bank's task is to oversee that these conditions are safeguarded.

### *Inducing change*

The result of Norges Bank's assessment may in some cases be that it is desirable to make changes to the system. Norges Bank may also conclude that the system does not comply with statutory requirements or the terms of authorisation. As a rule, the operator and Norges Bank will agree on a solution after having discussed the matter. This assumes, of course, that the operator recognises the need for change and that the requests from Norges Bank are well founded.

The Payment Systems Act gives Norges Bank the statutory authority to instruct authorised system proprietors to make changes in their system or system routines. This authority has only been used once, in 2004. At that time, Norges Bank required authorised system proprietors to prepare an annual report on risk and vulnerability analyses, contingency testing and routines for dealing with deviations and changes.

Within the limits pursuant to the duty of confidentiality, Norges Bank places emphasis on full transparency with respect to goals and tools in the supervision and oversight work. The most important elements of this work are described on Norges Bank's website under "Payment Systems". Norges Bank's assessment of individual systems on the basis of international recommendations is published in *Annual Report on Payment Systems*.

## 4. Cooperation with Kredittilsynet (The Financial Supervisory Authority of Norway)

Pursuant to the Payment Systems Act, Kredittilsynet is responsible for ensuring that systems for payment services are organised and operated in a way that promotes secure and efficient payment and effective and coordinated execution of payment services. Norges Bank has been given responsibility for interbank systems. Kredittilsynet and Norges Bank have regular meetings and exchange information on incidents and developments in the two parts of the payment system.

In their follow-up of operational risk, Norges Bank and Kredittilsynet have agreed to exchange information concerning planned follow-up of systems for which both institutions are responsible as well as information (test reports and the like) of mutual interest. If one institution plans on-site IT supervision/supervisory meeting where IT contingency arrangements are discussed, the other institution will be informed and may also be invited to participate as an observer.

Kredittilsynet is responsible for the securities settle-

ment systems. Such systems comprise two elements: the transfer of ownership of the security from the seller to the buyer and the cash transfer from buyer to seller. Norges Bank is responsible for oversight of the cash leg of the security settlement in Norwegian Central Securities Depository (VPS) since this settlement is executed through accounts at the central bank. Therefore, Norges Bank and Kredittilsynet cooperate closely. The cooperative framework and the division of responsibility are based on an agreement between the two institutions providing for mutual exchange of information and consultation before making important decisions. Norges Bank and Kredittilsynet have monthly contact meetings where the agenda includes a discussion of the situation in financial institutions and securities markets. These meetings also cover current topics related to security settlement systems, including international recommendations, structural changes, risk assessment and contingency arrangements.

## 5. Future challenges

In 2005, the International Monetary Fund (IMF) assessed parts of the Norwegian payment system.

The IMF report (IMF 2005) stated, among other things:

"Norway fulfils all prerequisites for effective payment clearing and settlement systems. The private sector plays an important role both in the provision of payment instruments and in payment clearing services. Cooperation between banks is well established and the common infrastructure is the basis for the individual bank's supply of payment services to the market. The relationship between Norges Bank and the banking sector is well-structured and cooperative."

The IMF also suggested some improvements. Further details are available in *Annual Report on Payment Systems* (Norges Bank 2006).

At present, it appears therefore that the industry's self-regulation, central bank oversight and supervision and cooperation between the industry and the authorities have resulted in sound solutions.

The financial system, however, is undergoing continuous change. Payment and settlement systems are being internationalised. This affects all parts of the economy that use deposit money to settle accounts.

For a number of years the EU has been working to achieve a common agreement for financial services in Europe and build an infrastructure to support this. The background for this can be found in the Lisbon Agenda of 2000, which aims to make Europe, by 2010, the most competitive and the most dynamic knowledge-based economy in the world. One means of achieving this is to enhance the efficiency of the European financial indus-

try through the revision of infrastructures for payments and use of payment instruments in Europe. The EU Commission is of the opinion that such a revision will lead to substantial savings. One directive<sup>5</sup> has recently been adopted by the EU Parliament. The directive will probably be EEA relevant, which means that the regulations must be incorporated into Norwegian legislation. In tandem with this, the European banking industry is working on a new and single platform for the use of payment instruments in Europe.<sup>6</sup>

In financial markets cross-border securities trading is increasing. Stock exchanges are being acquired and merged. This is also the case for securities depositories, which register ownership of securities. Investors are demanding new financial products and the cross-border market for commodities derivatives is growing. Financial institutions are being internationalised and want to be able to move liquidity quickly and inexpensively between the countries in which they operate. The European Central Bank has recommended the development of a new system for securities settlement in euro - possibly other currencies as well. The operation of the IT systems that underpin financial transactions will be outsourced to data processing centres in other countries.

These developments will significantly affect the infrastructure for payment settlements. Central banks and supervisory authorities are now facing new challenges in their oversight and supervisory work. In its oversight work, Norges Bank's goal will be to continue to cooperate to ensure that tomorrow's payment systems remain efficient and contribute to financial stability.

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<sup>5</sup> Directive on Payment Services

<sup>6</sup> Single European Payments Area - SEPA