

## Jarle Berge: Efficiency in the Norwegian payment system

Speech by Mr Jarle Berge, Deputy Governor of Norges Bank (Central Bank of Norway), at the Conference on payment systems 2002, Oslo, 14 November 2002.

*The text below may differ slightly from the actual presentation.*

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Thank you for your invitation and for the opportunity to present Norges Bank's views on developments in the payment system at this important conference where payment system experts are gathered. In particular, I will discuss issues related to efficiency in the Norwegian payment system today.

This is an area in which our political authorities have delegated a responsibility to Norges Bank. Section 1 of the Norges Bank Act from 1985 states that "...Norges Bank shall promote an efficient payment system domestically as well as vis-à-vis other countries..."

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### 1. An efficient payment system

- Payments should be processed
    - Fast
    - At reasonable cost
    - Safely
  - These three features receive different emphasis in the retail payment system and the interbank payment system
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We have defined an efficient payment system as a system that settles payments quickly, safely and at reasonable cost. This definition applies to both interbank and retail payment systems. These three elements receive different emphasis depending on the type of payment involved. In connection with interbank systems, we place considerable emphasis on safety, because delays or failure of a payment settlement may lead to a liquidity shortage or loss in some banks. These problems may in turn spread to a number of banks and at worst threaten financial stability.

Retail payments consist of many transactions of limited size and retail settlement amounts are normally modest. Normally, problems in the retail payment system will not pose a threat to financial stability. Therefore, more emphasis can be placed on executing retail payments quickly and at reasonable cost.

The purpose of the provisions in Chapter 3 of the Act relating to Payment Systems, etc. from 1999 is to contribute to ensuring that systems for payment services are organised and operated in a way that promotes safe and efficient payments and effective and coordinated execution of payment services. This responsibility has been delegated to the Norwegian Banking, Insurance and Securities Commission. The Norwegian Banking, Insurance and Securities Commission and Norges Bank cooperate closely on issues of relevance to the retail payment systems. In accordance with the requirements of the Norges Bank Act, Norges Bank has focused on efficiency in the retail payment system as a whole.

In most western countries, the payment system lays claim to between 1 and 3 per cent of GDP. More efficient structures can therefore result in substantial savings and free up resources for other purposes. In Norway, banks use NOK 5.9 billion to produce payment services. Costs to the payer and payee in connection with payment transactions come in addition. Norges Bank considers it important, therefore, that payment services are organised in a way that enables the market to find efficient solutions for production and use of such services. In this presentation, I will focus on retail payment systems.

## Criteria for assessing efficiency

We place emphasis on four elements when assessing the efficiency of the retail payment system.

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### 2. Efficiency in retail payments depends on

- Access to appropriate payment instruments
  - Direct pricing of all payment services
  - Exploitation of economies of scale and network externalities
  - Competition in the supply of payment services
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It is important that both corporate and retail customers have access to payment instruments that cover their needs in all payment situations. Customers must feel confident that payments reach the correct payee at the correct time. This in turn requires a high level of operating reliability in the electronic payment systems and correct processing of paper-based payment instruments. The security experienced by customers in connection with different payment instruments has an impact on the use of the instruments and thus also on the public's perception of whether the service range is acceptable.

Prices tell customers something about the value of the product or service and the costs associated with procuring the product. This affects customer preferences. Prices which reflect the relative costs of producing different payments services provide important incentives for selecting the services that satisfy their needs at the lowest possible cost. Overall, this will provide solutions that reduce the use of resources and increase efficiency in the payment system. Cost coverage through high interest margins and float implies hidden costs for customers and makes it difficult to choose correctly on the basis of product costs and features. Therefore, there should be as much direct pricing as possible. The customer who chooses among various payment instruments should bear the cost of this choice.

The production of payment services is characterised by economies of scale. Development costs are high and the requirements as to operating reliability and back-up solutions for the computer systems are stringent, while the cost of producing one extra unit is low. This applies in particular to the electronic payment services. We then face a classic pricing problem that is described in economic theory. If the price is set equivalent to the cost of producing the last unit (marginal cost), which in a certain sense is "correct" pricing with regard to efficiency, the manufacturer will not fully cover his costs. The manufacturer must then cover the remaining costs with the profits from other services. Innovation and development of new products are important driving forces behind increased efficiency in the payment system. In order to finance development activities, banks and producers of payment services must have a certain profit. Both direct pricing of payment services and other income may generate this profit. If the profit is to come from direct pricing, the income must cover more than the production costs.

When new products are introduced, a price that is lower than the direct costs may, however, have a positive effect on efficiency. Since price affects demand, a low price can contribute to extensive use of the service at an early stage. This ensures that economies of scale and any positive network externalities are exploited at an early stage. By positive network externalities, we mean that the utility for each individual system user increases when additional users join the system. The system where the network externalities are probably strongest is the EFTPOS system (a system for card payments in electronic point-of-sale terminals). Here, increased card use leads to growth in the number of payment terminals which in turn provides the basis for increased card use. When the price is low, the indirect costs may be covered later by not reducing prices correspondingly when use increases and development costs have been repaid. As an alternative, the fixed costs must be covered by cross-subsidisation from other payment services or other types of services offered by banks.

Both economies of scale and positive network externalities suggest that the number of producers of payment services will be limited and that they will use common standards. A single producer will ensure full exploitation of economies of scale, but at the same time, this producer would be able to charge monopoly prices. A single producer also implies a concentration of risk which may be undesirable. In addition, a monopolist may have few incentives to engage in product development. In most cases, therefore, efficiency will be higher with several competing producers of payment services. A genuine possibility that new participants may enter the market may prevent monopolists from taking out a monopoly profit. This may also encourage the producer to maintain a high level of operating reliability and to further develop the services.

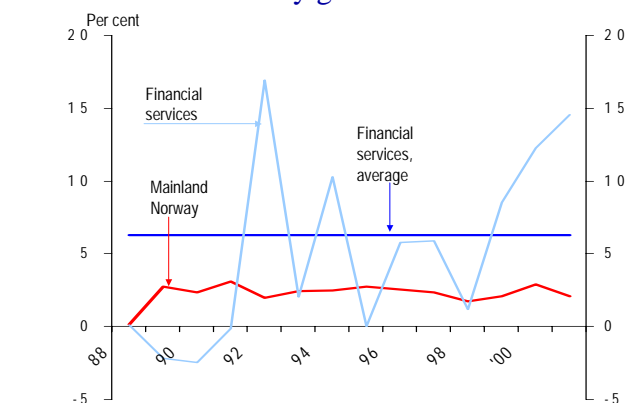
Strong customers may also contribute to reducing the power of the large producers. Customers' bargaining power normally depends on their size, and small banks can collaborate and form alliances to increase their bargaining power as buyers. However, the majority of the banks' customers will not have bargaining power vis-à-vis banks, so it is important that there are many banks competing to supply payment services to customers.

### Efficiency in the Norwegian system

Overall, the Norwegian system for retail payment services is fast, reasonably priced and safe.

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### 3. Productivity gains in the 1990s



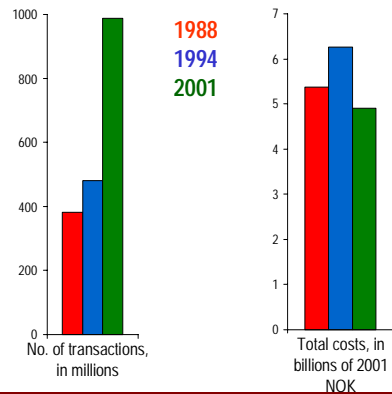
Retail payments are settled in Norges Bank twice a day. Depending on the time of day that the payment is made, the funds will be available in the payee's account on the same day that payment is made or the next working day. Direct pricing for payment services is much more widespread in Norwegian banks than in banks in most other countries. The price of the services is charged per transaction to the payer and the public may choose the services that cover their needs at the lowest possible price. Since the Act relating to Financial Agreements came into force on 1 July 2000, the float in the Norwegian payment system has been removed.

Prices that reflect the relative differences in production costs have had a positive affect on efficiency in the payment system. The economic impact is so substantial that it is visible in the national accounts. The revised national accounts show that GDP growth and productivity growth in the 1990s have been considerably stronger than assumed earlier. The new figures show that annual productivity growth for mainland Norway was 2.4 per cent in the 1990s. Financial services, with annual productivity growth of 6.3 per cent in the 1990s, is the sector that contributed most to this increase. This contributed 0.2 percentage point of the rise in productivity for mainland Norway. This is partly because of a general increase in efficiency after the banking crisis, but is also because of sharp productivity growth in the payment system. The productivity growth is a result of more cost-effective production of various services as well as increased use of payment services with low production costs. As a result of banks' direct pricing of payment services, the most cost-effective services have shown the strongest growth.

Norges Bank has recently completed a survey of banks' costs in connection with providing payment services. We have received detailed responses from seven banks, two large and five smaller banks, that account for 38 per cent of the volume in the payment system. We have examined banks' direct costs and indirect costs such as those connected with personnel, operation of computer systems,

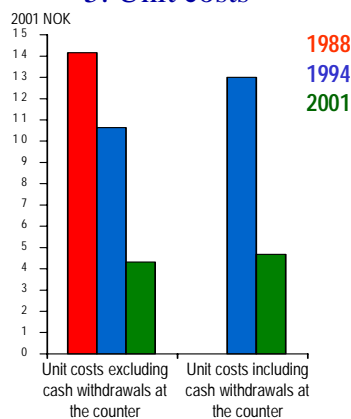
business premises, machinery, inventory, etc. Development costs related to new products have been included and spread over the economic life of the service. The survey is described in an article that will appear in the next issue of *Economic Bulletin* which will be published in December. It will also be available on our website in December.

#### 4. Transaction volume and total costs



In 2001, banks spent NOK 5.9 billion to produce one billion payment and cash transactions, compared with NOK 6.3 billion to produce less than half the number of transactions in 1994.

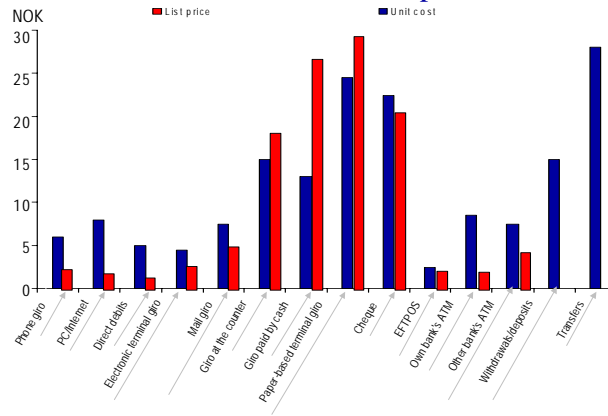
#### 5. Unit costs



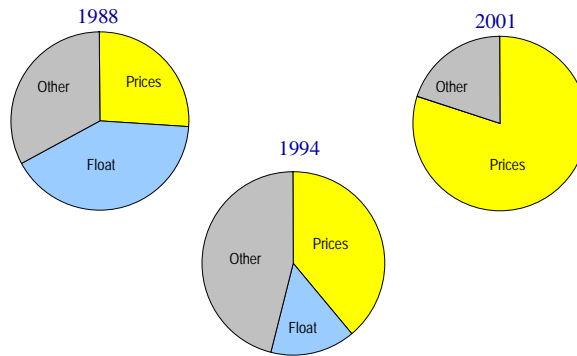
As you probably know, we also investigated the costs related to payment transactions in the largest banks and Norway Post in 1988 and 1994. At constant 2001 NOK, the cost per transaction fell from NOK 14.10 in 1988 to NOK 10.70 in 1994. In 2001, the average cost per transaction was NOK 5.30. Since 1988, the cost of an average transaction, at constant prices, has fallen by a good 60 per cent.

Banks have steadily increased the scope of direct pricing so that the degree of cost coverage by means of direct pricing has nearly doubled both from 1988 to 1994 and from 1994 to 2001. In 2001, 70 per cent of costs were covered by means of direct pricing.

### 6. Unit costs and list prices

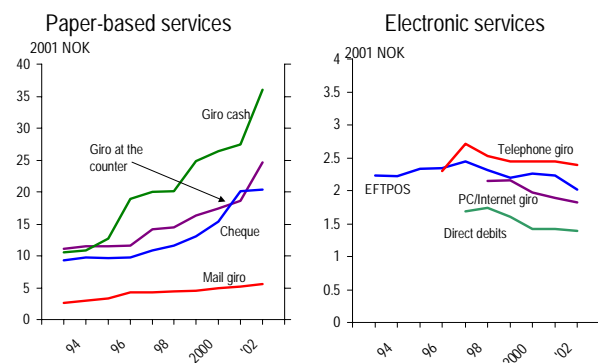


### 7. Cost coverage in 1988, 1994 and 2001



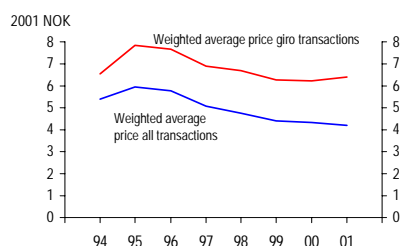
Due to changes in banks' service range, users participate more extensively in the production of payment services and cover some of the costs directly. This applies in particular to the use of terminals, PCs and telephones for bill payment and to cash withdrawals in connection with goods purchases. The survey does not cover customers' time and travel expenses and expenses related to telephone or PC. These costs would have had to be included in order to provide a complete overview of society's total costs related to the payment system. Users' participation in the production of payment services does not necessarily have a positive impact on society's overall efficiency in the production of payment services. Increased use of e-invoicing will, however, increase the efficiency of electronic bill payment. The survey does not cover the payees' costs related to invoicing.

## 8. Price developments 1993 - 2002



Both developments in the use of payment services and research show that prices affect customers' use of different payment services. Despite the price increase for most paper-based services, the weighted average price per transaction, at constant prices, has fallen since 1994.

## 9. Average prices (weighted by transaction)



For most services, customer prices are lower than banks' unit costs. The exception is giro services at the counter. The unit cost for EFTPOS has declined so that transaction prices nearly covered costs in 2001. Prices have fallen because the transaction volume has increased and costs related to developing and introducing the system have been repaid. The price for using a card in a POS terminal has not risen appreciably in recent years. The unit cost for paying bills over the Internet is still high. This is probably because development and introduction costs are still not repaid and because there is excess capacity in the banks' solutions. Customer prices cover less than one-fourth of the costs reported by banks in connection with this service. It appears that banks are pricing this service on the basis of a long-term strategy that low prices during the introduction phase will encourage customers to use new, more efficient payment instruments earlier. If the pricing strategy actually increases use, it may contribute to increasing efficiency in the payment system in the long term because economies of scale will be exploited at an early stage.

In Norway, the Banks' Standardisation Office establishes the standards for payment services. The Banks' Payment and Central Clearing House (BBS) and EDB Fellesdata produce most of the payment services in Norway. In some areas, the two companies produce different kinds of services, while in other areas, they compete in the same market. This solution exploits economies of scale in the development and production of payment services.

## Reduction of risk in the payment systems

Risks in payment systems have received increased attention in the 1990s, both internationally and here in Norway. An average of NOK 160-170 billion is settled in Norges Bank's Settlement System every day. In addition, a number of banks settle transactions in Union Bank of Norway and Den norske Bank. If a bank is incapable of timely settlement, the settlement systems may be a source of financial instability. The settlement systems may also contribute to spreading liquidity and solvency problems.

The Committee on Payment and Settlement Systems (CPSS) in the Bank for International Settlements (BIS) has established 10 core principles with which all systemically important settlement systems must comply in order to limit risk in the payment system. Norges Bank's assessments indicate that all the important bank-operated settlement systems in Norway that have been authorised, i.e. the systems operated by Union Bank of Norway, Den norske Bank, NICS (Norwegian Interbank Clearing System) satisfy these 10 core principles.

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### 10. Risks in the payment system

- **Legal risk**
    - Uncertainty in agreements and division of responsibility
  - **Settlement risk – credit and liquidity risk**
    - Credit risk is the risk of loss when the payer is unable to meet his obligations
    - Liquidity risk is the risk that the counterparty is unable to meet his obligations at the agreed time
  - **Operational risk**
    - Problems or interruptions in computer systems or communication lines or insufficient routines
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Risk in the payment system is often divided into four categories. Legal risk is related to uncertainty about agreements and the distribution of responsibility. The Payment Systems Act shall contribute to an organisation of the systems that promotes financial stability. The act also transposes the EU Directive on settlement finality into Norwegian law. The Directive protects approved payment and securities systems against legal risk associated with the insolvency of a participant. Norges Bank has notified all important settlement systems to the EFTA Surveillance Authority, ESA, thus providing them with legal protection. The legal risk as defined above should therefore be eliminated for these settlements.

Settlement risk consists of credit risk and liquidity risk. The banking industry's transition to crediting after settlement has eliminated most of the credit risk. Liquidity risk is also limited because Norges Bank offers liquidity through the day which is only limited by the collateral furnished by the banks. In gross settlement in Norges Bank, banks have coordinated their transaction exchange and there is a built-in anti-gridlock function which becomes operative if a transaction lacks cover. So far, queues have not been a problem in NBO. Settlement risk is therefore not considered a threat to financial stability.

The fourth type of risk is operational risk. Operational risk arises as a result of failure or downtime in computer systems or communication lines between systems or inadequate routines. After one of the major operators experienced a system breakdown that lasted several days in the summer of 2001, all the key operators in the settlement system have initiated measures to increase operational reliability and to have better back-up solutions in the event of any disturbances at the ordinary operations site. The problems during the summer of 2001 had no impact on financial stability, but reduced the efficiency of the Norwegian payment system until the operators had restored normal operations.

The operational reliability of Norges Bank's Settlement System has been very high the last year. In the period from 8 October 2001 to 5 June 2002, Norges Bank has not been responsible for any settlement errors, i.e. 239 days without errors. On 5 June 2002, an error that was classified as a small error by BBS gave us one error point. Since 5 June, operations have run smoothly, i.e. 162 days without errors.

Despite these positive results, Norges Bank has decided to modernise the current settlement system because the existing system is complicated and tightly interwoven with other systems. This makes the settlement system vulnerable. Operation and maintenance of the current system also require relatively extensive resources. Following discussions with the banking industry about the division of responsibility and organisation of the Norwegian clearing and settlement system, it has been decided that the current division of responsibility will remain virtually unchanged. Banks will be responsible for gathering transactions and for netting and Norges Bank will be responsible for settlement. Norges Bank has decided to outsource the operational activities of settlement. We are currently preparing an invitation to tender for prospective partners.

We will devote considerable attention to these issues in the future. We assume that we will have a definite plan for the site of our settlement operations by summer 2003, with implementation next autumn.

### **International recommendations and work**

The Committee on Payment and Settlement Systems (CPSS) in the Bank for International Settlements (BIS) has established a separate Working Group on Retail Payment Systems. In September this year, the working group submitted a report on "Policy issues for central banks in retail payments".

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## **11. BIS recommendations**

- **In the work on retail payments, central banks should focus on four important areas:**
    - Ensure that the legal and regulatory framework is not an obstacle to innovation and development
    - Monitor market structure, market developments and the market performance, and ensure that conditions are conducive to competition
    - Monitor the development of safety and operational standards and evaluate the effect of such standards on competition in the market
    - Provide settlement services in a way that contributes to efficient and safe solutions in the rest of payment system
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The report considers how central banks should work in order to achieve the goal of efficient retail payment systems and it identifies four areas in which central banks can become involved.

- Ensure that the legal and regulatory framework is no obstacle to innovation and development.
- Monitor the market structure, market developments and market performance and ensure that conditions are conducive to competition.
- Monitor the development of safety and operational standards and evaluate the impact of these standards on competition.
- Provide settlement services in a way that contributes to efficient and safe solutions in the rest of the payment system.

We will place emphasis on these recommendations in our future work on retail payment systems.

The ECB has recently reviewed a proposal that key retail payment systems should also comply with six of the core principles for systemically important payment systems established by the BIS/CPSS. It is up to each country's central bank to determine which retail payment systems are important and must therefore comply with the six recommendations.

The proposal implies that retail payment systems must have a well-founded legal basis. The individual participant should have a clear understanding of the financial risk connected with participation in the system. Further, the retail payment systems should ensure a high degree of safety and operational reliability and should have satisfactory contingency arrangements. The system should also provide efficient and practical payment solutions. The system should have objective and publicly disclosed



criteria for participation, which permit fair and open access, and the system's governance arrangements should be effective, accountable and transparent. The ECB suggests in addition that the four remaining core principles may be applied to retail payment systems. Of these, the ECB is of the view that the core principle concerning final settlement on the day of value should receive highest priority.

Norges Bank has not made a thorough evaluation of the Norwegian retail payment system in relation to the six recommended core principles. Nevertheless, I will present some preliminary assessments of where the Norwegian retail payment system stands in relation to these recommendations.

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## 12. ECB proposal for core principles for retail systems

- I. The system should have a well founded legal basis under all relevant jurisdictions.
- II. 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.
- VII. The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.
- VIII. The system should provide a means of making payments which is practical for its users and efficient for the economy.

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## 13. ECB proposal for core principles for retail systems

- IX. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.
- X. The system's governance arrangements should be effective, accountable and transparent.

In addition, this principle should also be fulfilled:

- IV. 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.

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The Act relating to Financial Agreements and the Payment Systems Act ensure that Norway has a modern, comprehensive legal framework for payment services. The Payment Systems Act has also contributed to removing banks' legal risk linked to participation in the payment system. Therefore, the Norwegian retail payment system should satisfy the principle of a well-founded legal basis. Earlier today, I concluded that settlement risk in the Norwegian payment systems was very limited. I believe we can also say that the financial risk has been publicly disclosed and is understood.

As I have already mentioned, all the key participants in the settlement system have initiated measures to reduce operational risk and improve contingency arrangements. Safety in the Norwegian retail payment system appears to be high. Therefore, I believe that the Norwegian retail payment system largely satisfies the principle of safety and operational reliability. As I have already said, Norway has a very efficient retail payment system. Therefore, the system complies with the core principle concerning efficient and practical payment solutions. Banks have clear rules about the criteria which new participants must satisfy in order to gain access to the common systems. The terms and conditions are publicly disclosed and the Norwegian Competition Authority has had no comments to them. The core principle concerning objective and publicly disclosed criteria for participation is therefore regarded as satisfied. The systems' organisation largely satisfies the core principle concerning effective,

accountable and transparent governance. The additional recommendation, i.e. compliance with the core principle concerning final settlement on the day of value, is also satisfied in Norway.

Internationally, central banks have also shown increasing interest in efficiency in retail payment systems.

### **Norges Bank's work with retail payment systems**

In the spring of 2002, we published a policy document that provides an account of our responsibilities in the payment system area. In this document, we discuss our earlier work in this area and premises and plans for future work.

Norges Bank monitors developments in the market and documents this in its *Annual Report on Payment Systems*. The report was the first of its kind and has received international recognition. The statistics in the report are based largely on voluntary reporting from the key participants in the Norwegian payment system, and we are very grateful for their cooperation.

It is the banking industry that makes decisions about the use of standards and about infrastructure development. Norges Bank will closely monitor the work and emphasise that standards and infrastructure be designed in a way that does not inhibit competition.

### **Which requirements should be satisfied by new payment systems?**

Innovation and development of new payment systems that satisfy new needs are important to maintaining efficiency in the Norwegian retail payment system over time. This requires that banks continue to develop their range of payment services.

When new payment services are developed, it is desirable to retain the common infrastructure. This implies that all systems are based on the same technology or that there is a common interface that allows the systems to communicate without any problems. To ensure efficiency in the market, open solutions which allow competition for production and delivery of services will be an advantage. Competition for production of services may conflict with exploitation of economies of scale. Norges Bank will place considerable emphasis on the existence of competition for delivery of these services to the users. We want new payment services to be priced according to the same principles as today. In other words, prices should reflect the expected unit costs in the long term.

The safety of new payment systems must also be satisfactory. This means that customers must feel confident that they will not be exposed to misuse when they use a payment instrument and that they can be sure that their payments reach the payees at the agreed time. This places stringent demands on the technical design of the services and on operational reliability and back-up solutions provided by those responsible for operations. Vis-à-vis customers, it is always the banks that are responsible for the payment services' compliance with safety and operational reliability requirements. Regardless of whether the services are purchased from a subcontractor, it is the banks that are responsible in relation to the customers. In other words, it is not possible to outsource the responsibility even though the operation has been outsourced.

### **Conclusion**

International fora are interested in the Norwegian payment system. We receive praise for the efficiency of the system. The banking industry must be given the credit for this because they have sought out efficient solutions and have cooperated on system development both within the industry and with the central bank. The cooperation between the central bank and the banks on gathering transaction, price and cost data is considered unique and extremely valuable.

We hope that Norway will continue to be a leader in developing the range of services and that the effective cooperation will continue in the pursuit of our common goal: An efficient payment system.

Thank you for your attention.