

Upgrading and outsourcing Norges Bank's settlement system

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In recent years, Norges Bank has focused more strongly on its core activities as a central bank, and this has also had a bearing on its activities related to the payment system. In this article, we will review recent years' efforts to evaluate Norges Bank's settlement system in light of the central bank's strategy and primary objectives. We will also provide information about the evaluation of possible models for organising the settlement system and about why Norges Bank has chosen to outsource. We will also comment on the risks inherent in such a solution and describe the implementation process.

1. Background

Norges Bank is responsible for promoting robust and efficient payment systems and financial markets, thus contributing to financial stability. Pursuant to Section 1 of the Norges Bank Act, Norges Bank shall promote an efficient payment system domestically as well as vis-à-vis other countries. The payment system is a key part of a country's economic and financial infrastructure. All cash flows – from large domestic and international financial transactions to private individuals' and households' daily purchases and bill payments – end up as transactions in a payment system. A well-functioning monetary economy depends on the availability, robustness and efficiency of this system.

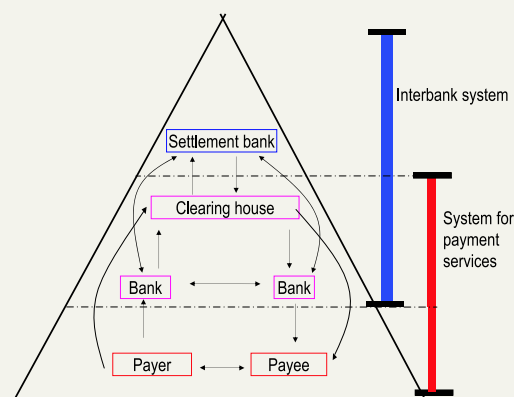
It is customary to divide the payment system into two levels: interbank systems and systems for payment services (see Chart 1). The systems for payment services include solutions for bank cards and electronic and paper-based systems for paying bills (Internet banking etc.). The interbank systems are systems for clearing and settling the cash flows between banks and with Norges Bank. In addition, there is cash, which continues to play an important role for smaller payments, although the volume of cash purchases is small relative to aggregate cash flows in the economy.

To ensure financial stability, the interbank systems must be designed in such a way that banks' settlement risk is manageable and that a bank's problems are limited to that bank. Norges Bank's main focus in the payment system area has therefore been on interbank systems. In recent years, priority has been given to reducing the risks in these systems in line with international recommendations. Pursuant to Act no. 95 of 17 December 1999 relating to Payment Systems etc., Norges Bank is responsible for the authorisation and supervision of interbank systems.

In many ways, Norges Bank functions as the bankers' bank in that banks can make deposits, receive loans and transfer funds to other banks. Norges Bank's Settlement System (NBO) gradually evolved during the 1990s, and an important milestone was the establishment of the current system in 1997. A primary central bank function of NBO is to offer banks settlement in risk-free payment instruments, i.e. claims on Norges Bank. Another key function is ensuring sufficient liquidity in the interbank market so that clearing and settlement do not come to a halt because a bank lacks sufficient liquidity. Liquidity is supplied primarily by allowing banks to borrow from Norges Bank, using securities as collateral. Other key functions are continuous checks for cover and instant posting of credits and debits. The system has a total average daily turnover of over NOK 200 million. The terms and conditions for participation in Norges Bank's settlement system provide an important framework for the payment system's mode of operation.

At the same time as Norges Bank developed NBO, the banking industry developed its own joint clearing and transaction system, the Norwegian Interbank Clearing System (NICS). Several million transactions based on bank card payments, giro payments or financial transactions pass through this clearing system every day. The system calculates the individual bank's total debt or claims vis-à-vis other participants. The total positions from NICS are sent to Norges Bank for settlement several times a day. The systems for clearing securities trades at the Norwegian Central Securities Depository (VPS)

Chart 1. The Norwegian payment system



Source: Norges Bank

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and derivatives trades at the Norwegian Futures and Options Clearing House (NOS) also send settlement orders to Norges Bank. The systems are closely interfaced, and during their development there was close collaboration between Norges Bank and the banking industry. The banks are free to choose either direct settlement in Norges Bank or indirect settlement via a private settlement bank. Most small and medium-sized banks handle their settlements via private settlement banks, but these banks represent a relatively small portion of the total settlements.

NBO consists of numerous subsystems that have been adapted regularly in order to meet changing needs. The heart of the system is an account maintenance system that was originally designed to handle a considerably larger number of account holders than exist today. Later, functionality was developed for the real-time transfers and settlement of payment orders. The system architecture has gradually become quite complex, and faults in one part of the system can easily have an impact on the entire system. Owing to the system architecture, changes relating to updates and maintenance have become high-risk areas, and the adaptations have involved relatively high costs and depended on the IT expertise of a few individuals.

Since this constitutes considerable operational risks and poses a risk of reduced operating stability, Norges Bank made preparations to upgrade the system and to consider more streamlined operating solutions. As the basic systems, especially those for keeping accounts, are approaching the end of their technological life, and system functionality has changed considerably since the system was adopted, it was natural to consider switching to new technology and moving in the direction of module-based systems.

2 Strategy and primary objectives for work on NBO

In recent years, Norges Bank has been working systematically to focus on its core activities: monetary policy, financial stability and investment management (Government Petroleum Fund). This has resulted in significant changes in the Bank's organisation: partly through spinning off activities into separate companies, partly through outsourcing and partly through downsizing. Although Norges Bank's role as supreme settlement bank in the Norwegian payment system constitutes a core activity, Norges Bank can discharge this responsibility without necessarily executing the daily operational and development tasks of the settlement systems.

The importance of the settlement system for the functioning of the financial infrastructure implies that when evaluating the future operating structure, the ability to maintain stable and reliable operations is of major impor-

tance. Flexibility to make functional and technical changes, and overall operating and development costs will also be important considerations. Thus, in terms of stability, cost and expertise, there are many advantages in an organisation where IT operations are core business, relative to a smaller, in-house IT department that is highly dependent on individuals. In any case, an absolute requirement for outsourcing the operations and development will be that the central bank is able to control main aspects of settlement system operations and development.

Since 1 July 2002, Norges Bank, like central banks in other countries, has charged for its settlement services. Pricing is important for managing resources at NBO and facilitates more rational solutions. In this manner, overall costs can be kept at a low level. The aim is to raise prices gradually until full cost coverage is achieved. However, some of the settlement system's functionality and use may be related to genuine central bank activities. Therefore, adjustments must be made for operating and development costs connected with Norges Bank's functions in the areas of monetary policy, market surveillance and other central bank functions not related to interbank settlement. Since the banks are to cover the costs in NBO, Norges Bank has agreed that they will have access to information concerning the use of settlement resources, and that they can participate in choosing functionality and deciding other aspects that are significant for system costs.

3 Possible models for organising NBO

As described above, NBO is a complex system that contains functionality for settlement between banks (interbank settlement) as well as for other central bank activities. Interbank settlement includes individual settlement (Real Time Gross Settlement – RTGS) and multilateral settlement of transactions from the Banks' Payment and Clearing House (BBS), from the Norwegian Central Securities Depository (VPS) and from NOS, and procedures for loans secured by collateral throughout the day. The functionality for other central bank activities includes market operations, including overnight lending, transactions connected with investment management, postings to the central government's consolidated account with Norges Bank and services for other central banks. In the current system, the functions are so intertwined that, for example, a fault in functions for interbank settlement can affect the operating stability of functions relating to other central bank activities, and vice versa.

A key objective of upgrading NBO has been to split up the various subsystems in order to make it more adaptable to changes and to reduce the operational risk. When upgrading, it is preferable to purchase "off-the-

shelf' rather than proprietary software, to ensure portability and international compatibility. The choice of solution should take into account that the Norwegian krone will continue to be an individual currency and that there will be a need for central bank settlement in Norwegian kroner. Developments in other countries should also be taken into account, and when upgrading NBO, the standard of potential solutions should be comparable to EU standards.

Comparisons with other industrialised countries show that there are considerable differences in the design of various central banks' settlement systems. The systems share certain core functions, such as the ability to provide real-time settlement and information as well as a form of secured borrowing rights in central bank funds. Additional functions appear to be determined more by national circumstances than by a more general international strategy for developing settlement system functionality. The models for system organisation and control also differ substantially. In most countries, the central bank owns, develops and operates the settlement system, while the banking industry is given some possibility of influencing system functionality.

The central banks in Denmark, Switzerland and Canada have chosen different solutions. In Denmark and Switzerland, external companies are responsible for the IT operation of settlement systems on behalf of the central bank. In Canada, the central bank's primary function is to keep settlement accounts for a limited number of banks. The banking industry, represented by a separate company, is responsible for processing all other transactions and for risk-reducing measures. This division of responsibilities gives banks a clear incentive to reduce their own risk exposure vis-à-vis other participants, and system operation appears to require relatively little in terms of resources. In all three countries, the central banks are able to carry out their responsibilities to promote efficient payment systems for the countries as a whole.

Two models were considered to be relevant for the future organisation of Norwegian interbank settlements in central bank money:

- A bank-based model, i.e. a model in which all settlement tasks and functions, except for the accounting and control routines, are handled by the banking industry itself. As long as Norges Bank's requirements for a robust and efficient payment system are met, the industry can decide how its own parts of the system are to be developed and run.
- A central-bank-based model largely based on the existing division of tasks and responsibilities. However, this does not require that operating and development functions shall be performed by Norges Bank.

Selecting the bank-based model would involve considerable restructuring of the technical system as well as fundamental changes in the banks' routines for using the system. The technical and operational implementation risk is therefore likely to be greater with the bank-based model than with the present central-bank-based model. In addition, the central-bank-based model is more in accordance with the solutions chosen elsewhere in Europe. Accordingly, the central-bank-based model provides more freedom of manoeuvre in the event of future integration with systems in other countries.

However, a bank-based model would imply less operational involvement and lower costs for Norges Bank, generally providing stronger incentives for cost-efficient operation. The overall costs for the Norwegian settlement system might therefore be lower with the bank-based model.

4 The choice of a model for the future NBO

Norges Bank will be able to discharge its primary responsibility of securing a robust and efficient payment system under both a central-bank-based and bank-based settlement model. From Norges Bank's perspective, a bank-based model may help to clarify the division of responsibilities between the central bank and the banking industry, enabling the central bank to concentrate on its essential tasks in the payment system. In the autumn of 2001, Norges Bank invited the banking industry to join a working group which in the first half of 2002 would consider the possibility of realising a bank-based model. The group discussed possible ways of organising the settlement system in Norway in light of the two models.

A bank-based model similar to the one in Canada would have the advantage of reducing Norges Bank's direct functional and operational responsibilities. Nevertheless, there are several reasons why it might be difficult to implement such a design for the settlement system in Norway. The banking industry was satisfied with the functionality of the existing settlement system and did not wish to assume a wider responsibility for the settlement functions. Further, a bank-based system would require a system of mutual responsibility among the banks that Norwegian banks have not been willing to undertake.

The banks were negative to a bank-based model because it would mean more responsibility and thus more risk for the banking industry – risk that would not be outweighed by the advantages of the model, seen from the banks' perspective. Besides, a more detailed review of technical matters revealed that a distinction between tasks that would be Norges Bank's responsibility in any case – such as keeping central bank accounts

and checks for cover – and functions that according to the model would be the industry’s responsibility, would be complicated to design. Therefore, Norges Bank decided to continue the existing division of responsibilities with the banking industry.

Although the division of responsibility between the banking industry and Norges Bank would remain essentially unchanged, there were no legal obstacles to outsourcing the operation and development of the central bank’s IT systems. However, simultaneously upgrading and outsourcing the settlement function would pose considerable challenges for a system as critical and complex as NBO. One of the main challenges would be to keep intact the expertise built up around NBO. Two main solutions were considered:

- Norges Bank is responsible for upgrading the settlement system and will consider outsourcing to an external operator.
- Responsibility for both operation and upgrading is given to an external service provider

A key issue was to determine which solution guaranteed that the necessary system expertise would be maintained. After an overall assessment, which was the subject of extensive internal discussion, a recommendation was made to Norges Bank’s Executive Board to continue the efforts aimed at outsourcing IT operations. To avoid the risk associated with simultaneously outsourcing and moving, and upgrading the system, it was decided that the upgrade would be postponed until after the outsourcing process was completed.

On 9 October 2002, the Executive Board endorsed these recommendations. It was decided that the work aimed at developing an outsourcing model should continue. A draft agreement with an outside provider was to be prepared by the end of the first half of 2003 to provide the basis for a final decision. The outside provider would have to meet stringent requirements regarding secure and stable operations, and Norges Bank’s need to monitor and control the system would have to be addressed. In order to meet these requirements, an outside provider would be dependent on the core expertise at Norges Bank. Therefore, in principle the outsourcing would be a transfer of undertaking in the labour law sense. The decision also underscored the need for close contact with the banking industry.

5 Implementation of the outsourcing

Choice of service provider

After the decision was taken, a project group was established to prepare for the outsourcing. A detailed description of the activities and functions that could be out-

sourced was drawn up. This description formed the basis of an invitation to tender sent to relevant providers of IT services. In selecting the providers to receive an invitation to tender, the following criteria were emphasised:

- Expertise in operating business-critical systems on IBM mainframes. The possibility of implementing a transfer of undertaking, involving systems, infrastructure and personnel
- Familiarity with and experience from the Norwegian payment system
- The ability to carry out the upgrade, involving the replacement of systems and system architecture

The invitation to tender was sent to several potential providers.

In addition to the settlement and central bank systems, outsourcing would include IT operations of the statistics systems as well as Norges Bank’s SWIFT terminal, which is also used by Norges Bank Investment Management for transactions related to the foreign exchange reserves and the Petroleum Fund.

After Norges Bank received the tenders, more detailed parallel negotiations were initiated with two promising providers in February 2003. The selection was made on the basis of the following criteria:

- Evaluation of the provider, business model and organisation
- Operating solution and implementation of the transfer of existing operations
- Risk and vulnerability
- Costs and overall efficiency
- Terms and plan for the transfer of personnel
- Plan for upgrading NBO

In the negotiations, Norges Bank attached considerable importance to designing a plan that would ensure the proper handling of the risk elements connected with the changeover, including the procedure for transferring staff. A successful transfer of key personnel familiar with Norges Bank’s systems was considered to be crucial. A substantial portion of the risk of outsourcing was connected with the actual move. The risk of disruptions in operation in this phase was considered to be higher than if in-house operation had continued. Proper supervision of the transfer of the systems was therefore another key requirement.

Outsourcing requires more explicit formal routines than in-house operation. This may reduce flexibility, but it may also increase awareness of costs and clarify the division of responsibilities. Overall customer satisfaction may thus be improved. In the negotiations, the emphasis was on striking a balance between the necessary formalism and desired flexibility.

An alternative solution to the proposed outsourcing

was to outsource the actual IT operations and retain the administration and further development of the business systems in-house. This alternative was considered riskier than keeping the IT environment together. Therefore, in the negotiations, Norges Bank attached great importance to the providers being able to deliver satisfactory solutions, not only for actual operations, but also for administration and further development.

To ensure the retention of the necessary expertise in both operations and administration/development, a model was developed whereby the provider would establish a core team consisting of key personnel from Norges Bank with critical expertise in the operation, administration and development of the systems. The core team was to be established immediately after the provider assumed responsibility, and for the entire term of the contract, the provider would be responsible for maintaining adequate systems development expertise in the core team.

The evaluation of the service providers included an analysis of their financial positions and their previous record as provider of secure and stable operations. Norges Bank emphasised that the agreements should contain provisions for handling issues that are critical to successful outsourcing. Such issues included contingency preparedness and dealing with non-conformance, security regulations, obligations in the event of termination of the contract and rules in the event of breach of contract.

After extensive negotiations, the tender from ErgoIntegration² was judged to be the best. An overall assessment of the cost picture showed that this contract proposal was financially more favourable, and that outsourcing would result in lower aggregate costs than continuing operations at Norges Bank. This comparison also took into consideration Norges Bank's expenses connected with necessary conversion activities after outsourcing.

The recommendation to choose ErgoIntegration as the provider of IT operations and administration of Norges Bank's settlement and central bank systems was approved by Norges Bank's Executive Board on 4 June 2003. On 19 June 2003, Norges Bank's Supervisory Council³ discussed the matter and unanimously approved implementation of the Executive Board's decision. On 30 June 2003, an agreement was signed between Norges Bank and ErgoIntegration. The contract specifies that the outsourcing is a transfer of undertaking, which implies that in addition to systems and hardware, the provider also takes over Norges Bank's employees with key IT expertise in the operation and development of the systems⁴.

On 1 September 2003, ErgoIntegration assumed responsibility for IT operations and administration as well as liability as employer for employees connected with systems operations. The term of the contract is

three years with an option for an additional three years. The systems and hardware were moved at the end of March 2004.

Banking industry involvement and plans for quality assurance

The settlement systems are the very heart of the financial infrastructure, and banks rely on the systems functioning as intended. It was therefore important that the banking industry was well informed and was given the opportunity to make specific suggestions while the process was under way. For that reason, Norges Bank held several meetings with industry representatives. The people who attended these meetings signed non-disclosure statements to keep the information out of unauthorised hands.

Norges Bank's Central Bank Audit issued several audit reports on various phases of the work to prepare for the outsourcing. The audit reports were submitted to Norges Bank's Executive Board and Supervisory Council. This helped to ensure that Norges Bank's governing bodies were briefed on the progress and quality of the project. Norges Bank also used outside quality assurance and legal assistance in negotiations with providers.

6 Status and further follow-up

Organisation and provider follow-up

The contract with ErgoIntegration will be administered and followed up by Norges Bank's Banking Department, which is the system owner of most of the outsourced systems. There are contract provisions that guarantee Norges Bank adequate control and supervision of the outsourced activity. For example, Central Bank Audit has the right to conduct audits on the provider's premises of activities related to the services for Norges Bank. The Banking Department has also established a separate unit to follow-up the contract. This unit includes three IT employees from the previous operating unit.

To ensure proper follow up, a number of forums have been established with representatives from Norges Bank and the service provider. The following three forums are especially important:

- The Management Forum shall follow up the overarching contractual relationship between the parties. This includes defining the measures necessary to fulfil the intentions of the contract and to ensure quality in the overall collaboration.
- The Service Forum shall evaluate whether the delivery complies with the contractual requirements for functionality, performance, service and quality, and

² ErgoIntegration is a wholly owned subsidiary of ErgoGroup, which in turn is wholly owned by Posten Norge AS (Norway Post).

³ The Supervisory Council ensures adherence to the rules for the Bank's operations and that operations are satisfactorily performed by others on behalf of the Bank.

⁴ Of the 40 employees in the in-house IT department, 26 were taken over by ErgoIntegration, while three remained in a separate unit in the Banking Department to look after Norges Bank's role as customer vis-à-vis the provider. Eleven employees were granted severance packages.

plan and prepare for implementation of the system changes agreed between the provider and Norges Bank. The Service Forum shall also function as a support resource for Norges Bank and recommend improvements that enhance the overall performance of the service provider.

- The Crisis Forum shall handle situations perceived by one of the parties as critical and to discuss crisis or nonconformity situations which call for the implementation of contingency measures, such as moving operations to an alternate site.

Handling change orders

In addition to operational responsibility, the contract with ErgoIntegration also covers responsibility for administration and development. The contract clearly stipulates rules and routines for the administration of changes and project implementation. The contract specifies responsibilities as well as the decision-making system. The Management Forum and Service Forum discuss and decide on changes in light of the significance of the change and its implementation. Changes are to be carried out within clearly defined time limits set according to the complexity and nature of the change (such as general maintenance, routine tasks and rush jobs).

Upgrading

The reasons for upgrading the settlement and central bank systems and the reason for the postponement have already been discussed. Outsourcing means that the systems will continue to be based on a mainframe platform. This would not have been possible if operations had continued at Norges Bank. The recent concentration on core activities has also clarified which tasks shall be performed by the system, making it possible to adapt the choice of system and capacity to these needs.

There is still a need for upgrading, and Norges Bank will study options and possible system solutions. The main focus, however, will be to ensure stable operations and a secure integration of current systems and hardware at ErgoIntegration.

Relationship with the banking industry

Prior to its contract with Norges Bank, ErgoIntegration's activity in the financial and payment system area was limited. Several of the other service providers that were considered already had extensive activities in this area. Therefore, the question arises as to whether the choice of provider will result in a fragmentation of the Norwegian payment infrastructure, which in turn may reduce its efficiency and increase the overall risk in the payment system.

This contract will mean reduced costs for settlement

services and thus lower costs for banks that will pay for these services. Increased competition in the payment system is expected to gradually yield further efficiency gains. All in all, outsourcing is expected to increase Norges Bank's flexibility in implementing necessary adjustments in the future.

Norges Bank and the banking industry have had an effective dialogue since the development of NICS and NBO in the mid-1990s. Norges Bank has a number of contacts with the industry in the payment system area. Some of these are of a formal nature, such as its supervision of NICS pursuant to the Payment Systems Act. Norges Bank also chairs the Contingency Committee for Financial Infrastructure (BFI), which is a formal body for providing alerts and coordinating crises and other situations that may cause disruptions in the financial infrastructure. Routines are also in place for technical monitoring and non-conformance handling in connection with the exchange of transactions etc., between NICS and NBO. There are also numerous forms of informal contact.

7 Conclusion

By outsourcing the payment system, Norges Bank has taken one more step towards concentrating on its core activities. However, the outsourcing of operation, administration and development of the IT systems used for settlements does not imply any change in Norges Bank's main responsibilities or services vis-à-vis the banks or other users of the payment systems. Outsourcing is expected to reduce the overall costs of this activity for Norges Bank and banks generally. Moreover, the vulnerability inherent in system operations and administration is expected to be lower after outsourcing. There are many challenges ahead both in the integration process and in the future work to upgrade the settlement system. In light of experience so far, the possibility of realising the objectives underlying the decision to outsource is considered to be good.