
Settlement Times for Payments in Denmark

*Jesper Bakkegaard, Tommy Meng Gladov and Anders Mølgaard Pedersen,
Payment Systems*

INTRODUCTION AND SUMMARY

When citizens in Denmark pay with their Dankort debit cards or transfer money via online banking services, the banks have to book the transactions to the customer accounts and exchange funds. Unlike cash payments, these payments are therefore subject to a certain settlement time, depending on the set-up of the payment system. Today, it usually takes at least one day to execute a Dankort payment or an online bank transfer.

Settlement times for payments of one or more days are not contemporary given that it is now common to exchange data in real time via computers and mobile phones. Moreover, there is a risk that such a long settlement time will make it more difficult to introduce new efficient payment instruments, e.g. money transfers via mobile phones, which require fast settlement if the customers are to benefit fully.

In several countries, with which Denmark is often compared, national payment systems have been restructured in recent years, reducing settlement times for payments. Typically, it is now possible to settle payments intraday in these countries – and in some instances even in real time – even if the payer and the payee have different banks.

In 2009, a working group chaired by Danmarks Nationalbank analysed settlement times for payments in Denmark. This was prompted by a request by the Minister for Economic and Business Affairs, who had been called on by the Folketing (Danish parliament) to examine why settlement times were longer in Denmark than in the Netherlands and the UK. The outcome was a report with recommendations that could lead to faster payment settlement.

The Danish Bankers Association, the trade organisation for banks, has subsequently assessed that the costs of changing the infrastructure according to the recommendations would not match the gains for the customers. Consequently, Danmarks Nationalbank has decided that the working group will continue and prepare a basis for decision with specific measures to reduce settlement times for payments in Denmark by year-end.

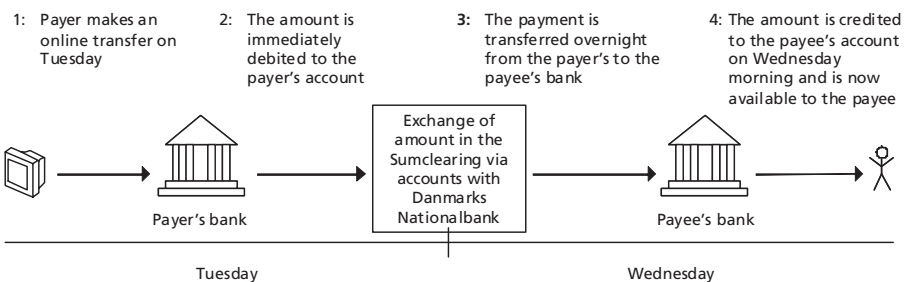
PAYMENT SETTLEMENT IN DENMARK

When a consumer in Denmark pays a bill by making an online bank transfer, the process includes the following steps, cf. Chart 1:

1. *Payment is made.* In his/her online banking service, the consumer – the payer – enters the payee's account number and, if relevant, a payment date. If it is an inpayment form, the payer has to enter a code indentifying the payment instead of an account number. Finally, the payer must typically confirm the transfer with a personal code.
2. *The amount is debited to the payer's account.* If the transfer is made on a banking day, such as a Tuesday as in Chart 1, the amount is debited immediately after the payer has confirmed the transfer. The payer's bank will, in practice, transfer the amount withdrawn to a special account, an intermediate account, which the payer cannot operate.
3. *The amount is transferred from the payer's to the payee's bank.* This is carried out in the Sumclearing payment system, cf. Box 1. Here the daily payments are collected before money is exchanged among the banks during the night. The amount of a payment made on Tuesday will thus be transferred from the payer's to the payee's bank during the night between Tuesday and Wednesday.
4. *The amount is credited to the payee's account.* This is effected in the morning after the money has been transferred to the payee's bank in the nightly settlement. The amount from an online bank transfer made on Tuesday will therefore be credited to the payee's account on Wednesday. The money is then available to the payee, and the payment is completed.

ONLINE BANK TRANSFER IN DENMARK, STEP BY STEP

Chart 1



Note: The payment is assumed to be made Tuesday before 6 p.m., which is the earliest cut-off time for online bank transfers for settlement during the night between Tuesday and Wednesday.

Source: Danmarks Nationalbank.

THE SUMCLEARING

Box 1

The Sumclearing is the Danish system for settling payments as card payments, credit transfers and transfers via Betalingservice (direct debit). The system is owned by the Danish Bankers Association, while Nets (previously PBS) is operating the system. At end-2010, the Sumclearing had 133 participants, all of which were banks. Some of them participated indirectly by having the money exchanged via another bank.

In the Sumclearing, payments are collected in two separate processes, called subclearings. One of them, the electronic clearing, is performed decentrally at the banks and comprises payments made by the banks' own customers, e.g. credit transfers, including online bank transfers, settlement of inpayment forms, cash withdrawals from ATMs and cheque payments.

In the second subclearing, the PBS clearing, the payments are collected centrally at Nets. It comprises payments via Nets' own products and other payments handled by Nets. These are primarily Dankort payments, transfers via Betalingservice, LeverandørService (supplier service) and Overførselsservice (transfer service) as well as payments using international payment cards.

At the end of the day, the banks' mutual payment obligations are calculated; first the electronic clearing and the PBS clearing separately and subsequently the two subclearings together. Thus, each bank ends up with an amount that it must either give to or receive from all other banks. This is the individual bank's net position in the Sumclearing.

The exchange of net positions between the banks takes place via accounts with Danmarks Nationalbank. As a main rule, this is executed in one combined settlement at 1.30 a.m. Before then, the banks have reserved money for the settlement, possibly by using their credit facilities with Danmarks Nationalbank, either as monetary-policy loans or intraday loans, against collateral.

Table 1 shows the number and value of the payments settled in the Sumclearing in 2010. Dankort payments accounted for the largest number, while credit transfers and payments via inpayment forms accounted for the highest value. This partly covers government payments such as block grants to the municipalities and VAT payments from the corporate sector.

PAYMENTS SETTLED IN THE SUMCLEARING IN 2010		Table 1
	Number (million)	Value (kr. billion)
Dankort, VisaDankort and cash cards	938.4	329.3
Betalingservice and LeverandørService	188.1	591.2
International payment cards	185.8	71.9
Credit transfers	175.1	3,241.4
Inpayment forms	114.9	1,161.6
Cheques	5.2	131.8
Total	1,607.5	5,527.3

Source: Danish Bankers Association and Nets.

The exchange of money among the banks in the Sumclearing is effected via accounts with Danmarks Nationalbank. This reduces the overall risks associated with the settlement of payments and complies with inter-

national standards. Danmarks Nationalbank has the same role in securities settlement in Denmark.

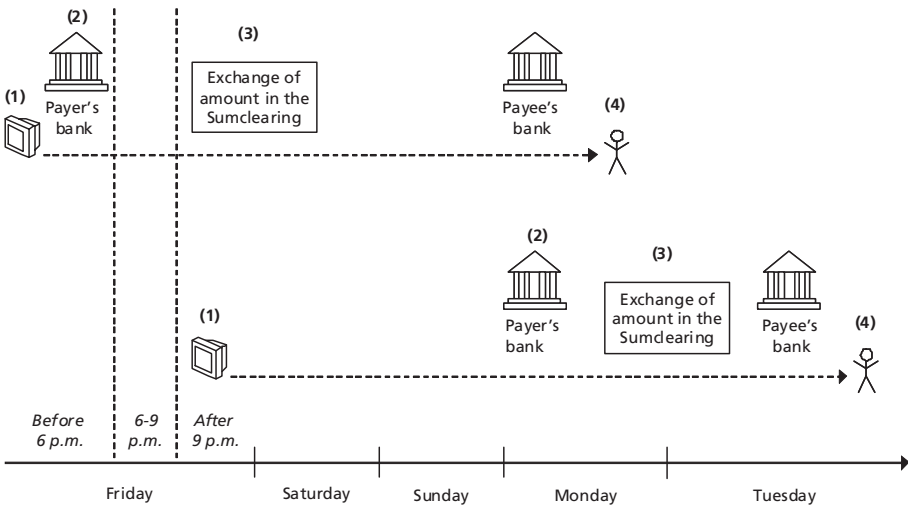
If the payer and the payee are customers of the same bank, the third step will obviously not exist. In that case, the bank will normally debit the money to the payer's account and credit it to the payee's account immediately, meaning that the transfer is settled instantly. In the following, the payer and the payee are assumed to have different banks.

If an online bank transfer is to be settled during the night, it must be made before a specific cut-off time, which is between 6 p.m. and 9 p.m., depending on the payer's bank. A transfer executed on Tuesday at 10 p.m. will thus be debited to the payer's account on Wednesday, settled during the night between Wednesday and Thursday and credited to the payee's account on Thursday.

In connection with weekends, the settlement time is longer than one day, cf. Chart 2. A transfer made on Friday before 6 p.m. will be debited to the payer's account on the same day and settled in the Sumclearing during the night between Friday and Saturday. However, the amount will not be credited to the payee's account until Monday, which gives a settlement time of 3 days.

If the transfer is made on Friday after 9 p.m., Saturday or Sunday, the money will typically be debited to the payer's account on Monday. The amount will subsequently be exchanged between the payer's and the

ONLINE BANK TRANSFERS IN CONNECTION WITH A WEEKEND Chart 2



Note: (1) The payer makes an online bank transfer, (2) the payer's bank debits the amount to the payer's account, (3) the banks exchange the amount in the Sumclearing via their accounts with Danmarks Nationalbank, and (4) the amount is credited to the payee's account.

Source: Danmarks Nationalbank.

payee's bank in the night between Monday and Tuesday and credited to the payee's account on Tuesday. In that case, the settlement time is 2-4 days.

Public holidays further extend the settlement time for online bank transfers. Thus, a transfer made on Wednesday before Maundy Thursday after 9 p.m. will be debited to the payer's account on Tuesday after Easter Monday, settled via the Sumclearing during the night between Tuesday and Wednesday and credited to the payee's account on Wednesday. This results in a 7-day settlement time.

Table 2 presents an overview of settlement times for online bank transfers made on each day of the week and selected public holidays.

For Dankort payments the current process is basically the same as outlined above. If a customer pays with a Dankort debit card in a shop on Tuesday before midnight, the amount will be debited to the customer's bank account on the same day. It will then be included in the nightly settlement and be credited to the shop's bank account on Wednesday.

The procedures for booking Dankort payments were changed in the autumn of 2009. Previously, the money was not debited to the customer's account until the day after the payment had been made, which would be Wednesday if payment had been effected on Tuesday. The

SETTLEMENT TIMES FOR ONLINE BANK TRANSFERS Table 2

Transfer settled	Before cut-off time			After cut-off time		
	Amount debited	Amount credited	Settle-ment time (days)	Amount debited	Amount credited	Settle-ment time (days)
Monday	Mon	Tue	1	Tue	Wed	2
Tuesday	Tue	Wed	1	Wed	Thu	2
Wednesday	Wed	Thu	1	Thu	Fri	2
Thursday	Thu	Fri	1	Fri	Mon	4
Friday	Fri	Mon	3	Mon	Tue	4
Saturday	Mon	Tue	3	Mon	Tue	3
Sunday	Mon	Tue	2	Mon	Tue	2

Thu before General Prayer Day	Thu	Mon	4	Mon	Tue	5
Wed before Maundy Thursday	Wed	Tue	6	Tue	Wed	7
Wed before Ascension Day	Wed	Mon	5	Mon	Tue	6
Fri before Whitsun	Fri	Tue	4	Tue	Wed	5

Note: The table indicates when the amount is debited to the payer's account and credited to the payee's account as well as the settlement time for online bank transfers made on various days, including in connection with selected public holidays. The cut-off time may vary between 6 p.m. and 9 p.m., depending on the payer's bank. On Saturdays and Sundays, the transfer time is irrelevant, as the payment is usually debited to the payer's account on Monday and credited to the payee's account on Tuesday. The settlement time for transfers made in connection with Ascension Day and Whitsun can be further extended if Constitution Day falls on a weekday around these public holidays.

Source: Danmarks Nationalbank.

changes should be viewed in light of the new rules on accrual of interest in connection with payments, see below.

Accrual of interest

Payment settlement times influence the customers' loss of interest income on the amount transferred. In Denmark, the banks' accrual of interest on payments is laid down in the Payment Services Act, which entered into force on 1 November 2009, implementing the Payment Services Directive.¹ Until then, no Danish legislation existed in this area.

According to the provisions of the Act, the payer's bank may not cease to add interest until the day on which the money is debited to the payer's account, cf. Chart 3. Likewise, the payee's bank must begin to add interest no later than on the day when it receives the money and usually will credit it to the payee's account.

If, as shown in Chart 3, the money is debited to the payer's account on Tuesday, the payer's bank will thus have to add interest until Tuesday. Similarly, the payee's bank, which receives the money on Wednesday, must begin to add interest no later than Wednesday. However, neither of these two banks needs to add interest to the customer's accounts from Tuesday to Wednesday.

These provisions limit the number of days when the customers forego interest due to payment transactions. In practice, the customers will only lose interest income for the period from the amount is debited to the payer's account until it is credited to the payee's account. As appears from Table 2, this period will usually be one day, unless payment is made late on Thursday, Friday before the cut-off time or before public holidays in which case it may be several days.

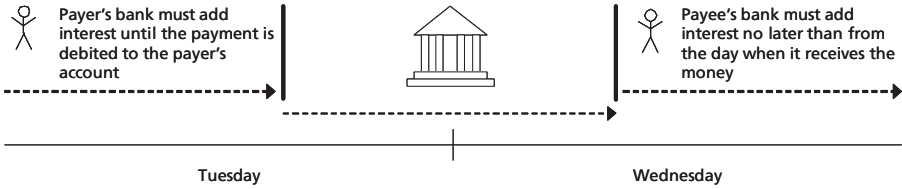
The loss of interest can be viewed as a loss for the payee. If, for example, goods are purchased using a Dankort on Tuesday, the customer will receive interest until this day. However, the shop does not receive its money and receive interest until Wednesday, the day after the goods have been sold.

The example with a Dankort payment on a Tuesday also illustrates what would have happened, had the booking of these payments not been changed in the autumn of 2009. Previously, the money in such a payment was not debited to the payer's account until Wednesday, but the bank usually ceased to add interest already on Tuesday.

Without changing the booking of Dankort payments, the payer's bank, according to the new provisions, would have had to add interest

¹ See Anders Mølgaard Pedersen, The directive on payment services, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter 2007.

PROVISIONS ON ACCRUAL OF INTEREST IN THE PAYMENT SERVICES ACT Chart 3



Source: Danmarks Nationalbank.

until Wednesday, the day when the amount was debited. As the payee's bank has to add interest from the same day, the customers would thus no longer forego one day's interest.

PAYMENT SETTLEMENT IN OTHER COUNTRIES

Over the past years, a number of countries have restructured their payment systems – or specifically plan to do so – with a view to reducing settlement times for payments. In several of these countries, such as Norway, Sweden, the Netherlands and the UK, intraday completion of payments is now possible, cf. Table 3.

Norway

For several years, it has been possible to execute e.g. online bank transfers and card payments intraday. The payments are settled in the NICS system, which calculates the banks' mutual obligations three times daily. The banks subsequently exchange money via accounts with the central bank, Norges Bank, before they immediately make entries to the customers' accounts.

The settlement time for a payment depends on which time of the day it is made. In the daytime, the amount is typically credited to the payee's

OVERVIEW OF THE PAYMENT SYSTEMS OF SELECTED COUNTRIES Table 3

	Can payments be settled intraday?	Payment types that can be settled intraday	Entry to customer accounts before settlement
Norway	Yes	All	No
Sweden	Yes	Online bank transfers	No
Netherlands	Yes	All	No
United Kingdom	Yes	Online bank transfers	Yes
Denmark	No	None	No

Note: The Table shows whether the national systems for settlement of consumers' payments – in Denmark the Sumclearing – provide scope for intraday settlement. The Swedish banking sector currently works on developing a new system for settling e.g. online bank transfers, so that they can be settled immediately.

Source: Danmarks Nationalbank.

account within 3 or 4 hours. The banking sector, which owns NICS, is considering introducing an extra daily settlement, thus reducing the settlement time further.

Sweden

Consumers can make online bank transfers intraday via the Data Clearing System, which calculates the banks' net obligations four times daily. As in Norway, money is exchanged at the central bank, Sveriges Riksbank, and the banks make entries to customer accounts immediately.

The banking sector is currently working on developing a new system for e.g. online bank transfers. This is inspired by the UK Faster Payments Service, see below, and will make it possible to make transfers that are received by the payee few seconds after – 24 hours a day, seven days a week.

Card payments are not settled in the Data Clearing System, but in systems owned by card companies, such as Visa and Mastercard. Settlement of these payments usually takes at least one day, and as in Denmark, it may take several days if the payments are made in connection with weekends and public holidays.

The Netherlands

In the Netherlands, payments are settled even faster than in Norway and Sweden. In the Dutch payment system, the banks' net positions are calculated every 30 minutes, and the amounts are exchanged on accounts in the Dutch central bank, De Nederlandsche Bank. As soon as the banks receive the necessary payment information, they book the customer accounts.

The Dutch banking industry is characterised by a high concentration ratio, since three banks account for almost all payments. Therefore, a relative large part of the payments in the Netherlands are between customers within the same bank. Such payments can be executed directly in the banks' accounting systems and thus immediately.

UK

Since May 2008, British citizens have been able to make credit transfers via the Faster Payment Service. The system is open 24 hours a day, seven days a week and guarantees that the payments are executed within two hours. In practice, this happens for most payments immediately, which is possible since the payments enter customer accounts before settlement.

However, this involves settlement risk, since the payee's bank has not yet received the payment amount from the payer's bank. Therefore, the

banks have implemented measures that reduce the risk and moreover, the banks' net positions are settled three times a day on accounts in the British central bank, Bank of England.

The Faster Payment Service does not handle card payments, which – as in Sweden – are settled in the card companies' own systems. A card payment in the United Kingdom is normally on the way for two or three days before it enters the payee's account.

WORKING GROUP ON NATIONAL PAYMENTS

In 2009, the Minister for Economic and Business Affairs asked Danmarks Nationalbank to chair a working group with the purpose of analysing settlement times for payments in Denmark. In connection with the reading of the Payment Services Act, the Folketing called for an examination of the reasons why settlement times are longer than in the Netherlands and the UK.

Danmarks Nationalbank set up a working group consisting of stakeholders in the Danish payments infrastructure. The working group's mandate was to identify the measures required for intraday completion of national payments. Furthermore, it was to assess the pros and cons of shorter settlement times.

In January 2010, the working group published a report, which recommended examination of how to reschedule and hence speed up settlement of payments in connection with weekends and public holidays and how to introduce an extra daily settlement of credit transfers, including online bank payments.

Moreover, the working group recommended examination of whether it was possible to postpone the banks' cut-off time for payments to be settled in that same night. This would allow more payments made during the evening to be included in the nightly settlement and be credited to the payee's account the following day.

The Danish Bankers Association has subsequently assessed the consequences of implementing the recommendations set out in the report and has concluded that – except for postponement of the cut-off time, which will not involve significant costs – the costs of changing the payments infrastructure will not match the gains for the customers.

Therefore, Danmarks Nationalbank does not consider the assignment of the working group to be completed. At the same time, developments in other countries have shown that there is a need to consider other models that could result in faster payment settlement. Danmarks Nationalbank has therefore informed the Ministry of Economic and Business Affairs that the working group will continue.

Against this background, Danmarks Nationalbank has summoned the working group to new meetings. At first, it will prepare a basis for decision with specific measures to reduce the settlement time for payments in Denmark as well as a time schedule. This work is intended to be completed by end-2011.