



DANMARKS  
NATIONALBANK

# Assessment of the Sumclearing

According to Core Principles for Systemically  
Important Payment Systems

December 2012

## CONTENTS

1.	Introduction .....	3
1.1	Danmarks Nationalbank's Oversight function .....	3
1.2	International standards for payment systems .....	4
1.3	Assessment categories .....	5
1.4	Summary .....	6
2.	Description of the Sumclearing .....	9
2.1	System owner, system operator and settlement bank.....	9
2.2	Participants .....	10
2.3	Clearing and settlement .....	10
2.4	The two subclearings.....	14
2.5	Settlement procedure in the Sumclearing.....	16
2.6	Prices .....	19
2.7	Modernisation of retail payments infrastructure .....	20
3.	Assessment of the Sumclearing.....	21
3.1	Core principle I – Legal basis .....	21
3.2	Core principle II – Understanding financial risks .....	27
3.3	Core principle III – Management of financial risks .....	30
3.4	Core principle IV – Prompt final settlement .....	36
3.5	Core principle V – Settlement in multilateral netting systemS.....	39
3.6	Core Principle VI – Settlement assets .....	43
3.7	Core principle VII – Security and operational reliability .....	45
3.8	Core principle VIII – Efficiency .....	51
3.9	Core Principle IX – Access criteria.....	54
3.10	Core principle X – Governance.....	57
4.	Literature .....	60

---

# 1. Introduction

---

The Sumclearing is the Danish system for settlement of retail payments such as Dankort payments, credit transfers and Betalingservice (direct debit) transfers. It is essential that payments via the Sumclearing are settled safely as a safe and efficient settlement system contributes to financial stability.

It is the responsibility of Danmarks Nationalbank to oversee systemically important payment and settlement systems. The oversight consists in e.g. assessing the systems against international standards and recommendations. The objective of this report is to assess whether the Sumclearing observes the Core Principles for Systemically Important Payment Systems, CPSIPS.

The basic structure of the Sumclearing is described in Chapter 2, and the assessment of the Sumclearing against the CPSIPS is presented in Chapter 3.

The assessment has been made on the basis of information received until end-September 2012.

## 1.1 DANMARKS NATIONALBANK'S OVERSIGHT FUNCTION

---

Danmarks Nationalbank's overall role in relation to payment and settlement systems, including the Sumclearing, is defined in section 1 of the Danmarks Nationalbank Act, which states that the objective of Danmarks Nationalbank is to "maintain a safe and secure currency system in Denmark, and to facilitate and regulate the traffic in money and the extension of credit".

In 2006, Danmarks Nationalbank's responsibility for oversight of payment and settlement systems was enshrined in the Danish Securities Trading Act. Pursuant to section 86(2) of this act, Danmarks Nationalbank is to oversee systems that are considered to be of significant importance to payment settlement in Denmark or to the implementation of monetary-policy transactions. Danmarks Nationalbank oversees payment and settlement systems of systemic importance, and the Sumclearing is defined as a systemically important payment system.

## 1.2 INTERNATIONAL STANDARDS FOR PAYMENT SYSTEMS

---

Danmarks Nationalbank's oversight function entails that systemically important payment and settlement systems, including the Sumclearing, must be assessed against relevant international standards. These standards have been prepared by a working group under the Bank for International Settlements (BIS) and are known as the Core Principles for Systemically Important Payment Systems, CPSIPS, cf. Box 1.

The Core Principles determine the overall requirements to be met by a well-functioning system. This report reviews and provides a brief description of each Core Principle and assesses the Sumclearing against the Core Principles and its degree of observance of the Core Principles.

In April 2012, the BIS published a new set of standards for oversight of systemically important payment systems. The new standards – "Principles for financial market infrastructures" – combine the three previous sets of standards set out in "Core Principles for Systemically Important Payment Systems", "Recommendations for Central Counterparties" and "Recommendations for Securities Settlement Systems" with a view to facilitating more consistent oversight of various types of financial infrastructures. The BIS has recently published a disclosure framework and assessment methodology. The new standards (called Core Principles) will form the basis for Danmarks Nationalbank's future oversight of the Sumclearing.

---

### THE BIS' 10 CORE PRINCIPLES FOR SYSTEMICALLY IMPORTANT PAYMENT SYSTEMS

Box 1

- 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.
  - III. 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.
  - 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.
  - V. A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlement cycles in the event of an inability to settle by the participant with the largest single settlement obligation.
  - VI. 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.
-

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.

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.

---

### 1.3 ASSESSMENT CATEGORIES

---

Five categories are applied when assessing the degree of observance of each Core Principle: *observed*, *broadly observed*, *partly observed*, *non-observed* and *not applicable*.

- Observed – used whenever all assessment criteria are generally met without any significant deficiencies.
- Broadly observed – used whenever only minor shortcomings are found which do not raise major concerns, and when corrective actions to achieve full observance of the Core Principle are scheduled and realistically achievable within a prescribed period of time.
- Partly observed – used whenever the shortcomings are sufficient to raise doubts about the ability of the system to achieve observance within a reasonable time frame.
- Non-observed – used whenever major shortcomings are found in adhering with the assessment criteria.
- Not applicable – used whenever the Core Principle does not apply given the structural, legal and institutional conditions.

The assessment of the Sumclearing against the Core Principles has been performed by Payment Systems at Danmarks Nationalbank. The assessment is based on self-assessment performed by the system owner, the Danish Bankers Association, and the system operator, Nets. The self-assessment is based on a number of questions relating to each of the 10 Core Principles under CPSIPS. Moreover, general legislation, rules, agreements, user manuals, procedures, system descriptions etc. form part of the assessment basis together with various analyses made in connection with the assessment. Even if the Sumclearing observes a Core Principle, a comment or recommendation may still be attached to the assessment.

## 1.4 SUMMARY

---

The table below shows the overall assessment of the Sumclearing against the individual Core Principles, and comments and recommendations are subsequently summarised. Recommendations and comments may be attached to Core Principles that have been observed overall.

Core Principle no.		Assessment
I	Legal basis	Observed
II	Understanding financial risks	Observed
III	Management of financial risks	Broadly Observed
IV	Prompt final settlement	Observed
V	Settlement in multilateral netting system	Observed
VI	Settlement assets	Observed
VII	Security and operational reliability	Observed
VIII	Efficiency	Broadly Observed
IX	Access criteria	Observed
X	Governance	Observed

### Core Principle I

In pursuance of section 57a(5) of the Danish Securities Trading Act, the Danish Bankers Association must notify Danmarks Nationalbank of the direct and indirect participants in the Sumclearing and any changes thereof. So far, the Danish Bankers Association has notified Danmarks Nationalbank only of changes concerning direct participants. In future, the system owner should also notify Danmarks Nationalbank of any changes concerning indirect participants.

### Core Principle II

The Danish Bankers Association's *Håndbog for Betalingsformidling* (payment systems manual) and *Aftalebog* (book of agreements) are available in Danish only. The system owner should consider whether there is a need for English versions of these documents.

**Core Principle III**

The risk of postponements during the night-time settlement cycle involves a liquidity risk for the participants. The liquidity risk is limited by the fact that e.g. low alternative costs of reserving sufficient liquidity mean that the participants usually hold large excess liquidity in the Sumclearing. However, in order to enhance the resilience of the system to financial stress and any liquidity shortage, more intraday settlement cycles should be introduced as recommended by the IMF in 2006. This would reduce the net positions of participants and the manual procedures of the 2nd extra settlement cycle would be avoided. Moreover, participants should be notified of their expected net payment obligations for the settlement, and the reservation of liquidity should be made more flexible. These recommendations have led to a "broadly observed" rating of Core Principle III. The ongoing modernisation of the Danish retail payments infrastructure is expected to accommodate these recommendations with the introduction of more intraday settlement cycles of credit transfers and improved liquidity management opportunities at the end of 2013.

**Core Principle VII**

Nets has entered into an agreement with IBM on the provision of two-centre operations, and switching of operations between the two data processing centres can be completed within an agreed four-hour time frame. The system owner should regularly assess whether the time frame of a maximum of four hours for switching between centres is still sufficient. International best practice is a time frame of a maximum of two hours.

**Core Principle VIII**

The current settlement times in the Sumclearing do not meet the expectations of the end users for a modern payment system and do not sufficiently support the development of new payment solutions. The long settlement times entail that the system cannot overall be characterised as being efficient for the economy and the end users. Against this backdrop, the Sumclearing is assessed as "broadly observed" for Core Principle VIII.

The ongoing modernisation of the Danish retail payments infrastructure ensures the immediate settlement of certain transfer types. Following the modernisation, the Danish retail payments infrastructure will fully match those of comparable countries. The modernisation project is expected to be completed by the end of 2014.

**Core Principle IX**

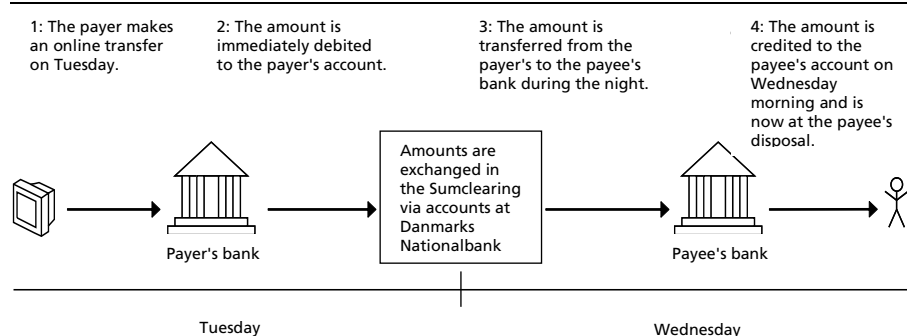
There are no access and exit procedures for the Sumclearing. It is therefore recommended that procedures are defined and described in e.g. the contractual basis and published with a view to ensuring that the participants are aware of the access and exit procedures. The IMF made a similar recommendation in 2006.



## 2. Description of the Sumclearing

When a Danish consumer makes a Dankort payment, a Betalingservice (direct debit) payment or a credit transfer, the banks must make entries into customer accounts and – if the payer and the payee do not use the same bank – exchange funds between themselves. This is effected through the Danish system for clearing and settlement of retail payments, the Sumclearing, cf. Chart 1.

AN ONLINE TRANSFER IN DENMARK, STEP BY STEP Chart 1



Note: It is assumed that the payment is made on a Tuesday before 6:00 p.m. which is the earliest cut-off time for online transfers for the night-time settlement.  
Source: Danmarks Nationalbank.

### 2.1 SYSTEM OWNER, SYSTEM OPERATOR AND SETTLEMENT BANK

The Sumclearing is owned by the Danish Bankers Association, which is the trade organisation for banks in Denmark. Its members include banks, savings banks, cooperative banks and Danish branches of foreign banks. The tasks of the Danish Bankers Association in relation to payment systems include coordinating the banks' positions on issues relating to the payments infrastructure in Denmark and maintaining the underlying agreements.<sup>1</sup>

The task of operating the Sumclearing is undertaken by Nets, which is responsible for the day-to-day operation and implementation of system changes. Nets is owned by Danish and Norwegian banks and Danmarks Nationalbank.<sup>2</sup>

<sup>1</sup> For further information on the Danish Bankers Association, see [www.finansraadet.dk](http://www.finansraadet.dk).  
<sup>2</sup> For further information on Nets' activities, see [www.nets.eu](http://www.nets.eu).

Danmarks Nationalbank acts as settlement bank for the Sumclearing in Danish kroner, and settlement takes place via special settlement accounts, known as Sumclearing accounts, at Danmarks Nationalbank. Danmarks Nationalbank extends intraday credit to participants against collateral, which contributes to supporting the settlement procedure.

## **2.2 PARTICIPANTS**

---

Participants in the Sumclearing are Danish banks or foreign banks with branches in Denmark or otherwise conducting cross-border activities in Denmark. Participants may choose to be either direct or indirect participants in the system. If a participant chooses to be a direct participant in the Sumclearing, the participant must be an account holder at Danmarks Nationalbank. The participant must hold a current account and a settlement account for the Sumclearing. Small participants typically choose to be indirect participants. A participant choosing to be an indirect participant does not hold settlement accounts at Danmarks Nationalbank.

Instead, an indirect participant enters into an agreement with a direct participant on holding an account with this participant. The indirect participant's payments are settled via the direct participant's Sumclearing account at Danmarks Nationalbank.

Both direct and indirect participants must be connected to a data processing centre. The two largest participants have their own data processing centres, while the remaining participants share data processing centres with other participants. The data processing centres handle the booking of payments to customer accounts and the exchange of data relating to such payments, cf. section 2.4.1 Electronic clearing and truncation.

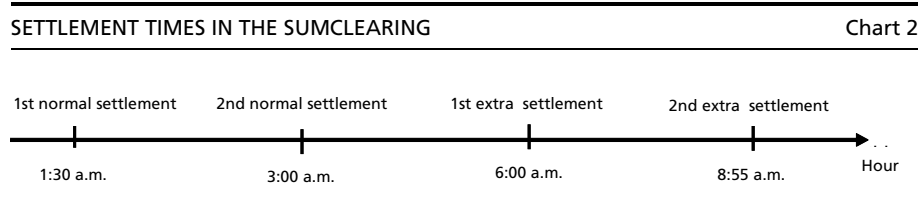
At the end of September 2012, the Sumclearing had 120 participants, of whom 58 were direct participants and 62 were indirect participants. By comparison, 66 were direct participants and 81 were indirect participants at the end of 2008.

## **2.3 CLEARING AND SETTLEMENT**

---

The Sumclearing is a multilateral net settlement system. This means that the participants' payment obligations are set off against their receivables, and subsequently the participants' net positions vis-à-vis each other are settled. The netting of participants' payment obligations reduces the need for liquidity in the Sumclearing.

Net positions are settled in one or more settlement cycles, mainly during the night-time, cf. Chart 2.



As mentioned above, the actual settlement of net positions takes place via settlement accounts at Danmarks Nationalbank. The accounts are not at the participants' disposal during the actual settlement procedure and are non-interest-bearing accounts. Read more about the settlement procedure for the Sumclearing under section 2.5.

### 2.3.1 Intraday credit at Danmarks Nationalbank

The monetary-policy day in Danish kroner starts at 4:00 p.m. and ends at 3:30 p.m. on the following day; during that period, Danmarks Nationalbank extends intraday credit against collateral, which enables night-time settlement in Danish kroner.

### 2.3.2 Collateral for intraday credit

Intraday credit is extended against collateral. Participants can use two different arrangements for pledging collateral for intraday credit in kroner at Danmarks Nationalbank.

Firstly, participants can pledge securities that meet certain conditions as collateral in the traditional manner.<sup>1</sup> The securities must be registered in a collateral custody account with the Danish central securities depository, VP Securities, and the custody account must be pledged to Danmarks Nationalbank. Eligible securities mainly comprise Danish government and mortgage bonds. The compilation of the total collateral value also includes the participant's certificates of deposit issued by Danmarks Nationalbank.

Secondly, participants may pledge collateral via automatic collateralisation.<sup>2</sup> Under the automatic collateralisation arrangement, the participant pledges collateral in the form of securities deposited in one or more designated custody accounts at VP Securities. Automatic

<sup>1</sup> Traditional pledging can be used for all types of credit from Danmarks Nationalbank, including monetary-policy loans, loans for cash depots and intraday credit in euro.

<sup>2</sup> The automatic collateralisation arrangement can also be used for trading settlement and VP Securities' periodic runs and for settlement of foreign-exchange transactions in CLS.

collateralisation is a more flexible credit arrangement than traditional pledging of collateral because, unlike traditional pledging of collateral, it does not bind specific securities assets in a custody account. Participants wishing to use automatic collateralisation must conclude an automatic collateralisation agreement with Danmarks Nationalbank and open an automatic collateralisation account, to which the credit is debited.

### **2.3.3 Reservation of liquidity for settlement**

Participants can reserve liquidity for the night-time settlement in the Sumclearing in two ways.

Firstly, the participant may transfer an amount from the current account to the Sumclearing account via Danmarks Nationalbank's real-time gross settlement system (RTGS), Kronos. Participants may choose to reserve liquidity manually or as standing orders. Participants must ensure that they have sufficient current-account deposits, certificates of deposits or make use of the access to intraday credit at Danmarks Nationalbank against traditional pledging of collateral. Transfer of liquidity for the night-time settlement can take place between 4:00 p.m. and 4:30 p.m.

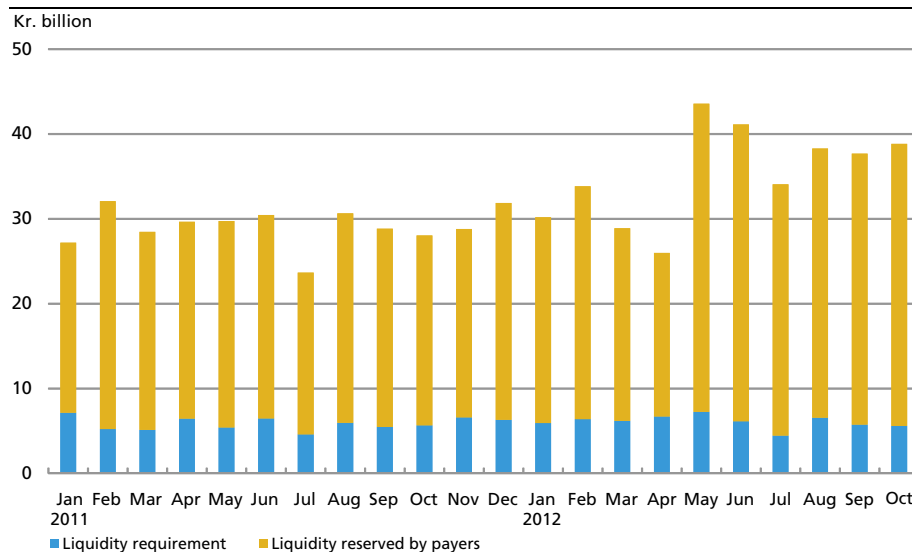
Secondly, the participant may choose to make liquidity available for the night-time settlement in the Sumclearing via automatic collateralisation. The participant reserves an amount under the automatic collateralisation arrangement. The reserved amount is credited to the participant's Sumclearing account and debited to the participant's automatic collateralisation account.

Liquidity may be reserved in both ways for the same settlement.

When participants have to reserve liquidity for the settlement, they do not know how much liquidity they actually need for the settlement in the Sumclearing. If a participant has not reserved sufficient liquidity, that participant's transactions will be postponed in the Sumclearing. In consequence, all the participant's transactions are removed from the settlement and will be sought settled at a later time, cf. section 2.5. Postponement of a participant's transactions entails calculation of new net positions for the other participants. Participants will typically seek to have excess liquidity to avoid postponement, cf. Chart 3.

## EXCESS LIQUIDITY IN THE SUMCLEARING

Chart 3



Source: Danmarks Nationalbank.

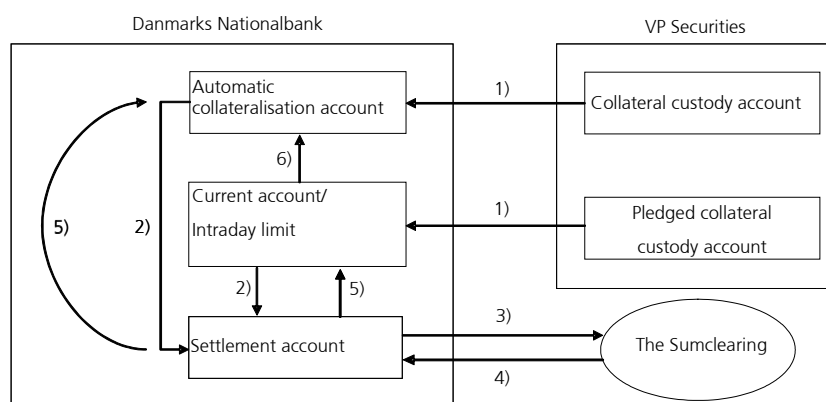
Note: The chart shows the total reserved liquidity of participants submitting liquidity during the settlement. Liquidity reserved by participants with a positive net obligation in the settlement is not included.

The largest drawings on the Sumclearing are seen on days with large payments to the central government such as VAT and income tax payments. Participants can make Sumclearing forecasts based on e.g. the timing of government payments, which are published by Danmarks Nationalbank, or based on own historical experience.

#### 2.3.4 Settlement procedure at Danmarks Nationalbank

Prior to each settlement, Danmarks Nationalbank notifies the Sumclearing or, in practice, the operator of the Sumclearing, Nets, of each participant's balance in the Sumclearing account. This amount is the participant's line in the settlement cycle in question. If the participants' net payments do not exceed their lines, settlement takes place by the exchange of funds via the participants' Sumclearing accounts. When the Sumclearing settlement is complete, the participants' balances on their Sumclearing accounts are transferred to their current accounts. Any unused amounts reserved under the automatic collateralisation arrangement are first used to reduce the credit under this arrangement. Any residual amounts in the participants' Sumclearing accounts are transferred to their current accounts. Participants must cover any outstanding credit under the automatic collateralisation arrangement by transferring funds from their current accounts by 1:30 p.m. at the latest.

Chart 4 illustrates the settlement procedure at Danmarks Nationalbank in connection with payment settlement in the Sumclearing.



- 1) VP Securities sends custody account data to Danmarks Nationalbank.
- 2) The account holder reserves an amount under the automatic collateralisation arrangement. This amount is debited to the automatic collateralisation account and credited to the settlement account for the Sumclearing. The account holder also transfers an amount from its current account to its settlement account for the Sumclearing.
- 3) Danmarks Nationalbank sends line data to the Sumclearing.
- 4) After the settlement has been completed, the Sumclearing sends net positions to be booked in the account holder's settlement account for the Sumclearing.
- 5) When the net positions have been entered, Danmarks Nationalbank covers any unused amounts reserved under the automatic collateralisation arrangement by the balance in the account holder's settlement account for the Sumclearing. Any residual amount is transferred to the current account.
- 6) The account holder covers any outstanding credit under the automatic collateralisation arrangement by transferring an amount from its current account.

## 2.4 THE TWO SUBCLEARINGS

Participants' net positions in the Sumclearing are calculated on the basis of two separate clearing cycles, known as subclearings. In one of the subclearings – electronic clearing and truncation – the calculation is made on a decentralised basis by the banks, i.e. the data processing centres of the participants. This subclearing includes payments made by the participants' own customers, e.g. credit transfers, including online transfers, settlement of inpayment forms, cash withdrawals from ATMs and check payments. In the other subclearing – PBS clearing – payments are compiled centrally. This subclearing comprises payments using Nets' own products or other payments handled by Nets such as Dankort

payments via online terminals and over the Internet, transfers via Betalingsservice and LeverandørService (supplier service), payments made abroad using a Visa/Dankort and payments made using international debit cards. The calculations from the two subclearings are added up at Nets. For each of the participants, an aggregate amount, or net position, is calculated which the participant either receives or pays in the Sumclearing.

The number and value of payments settled in the Sumclearing in 2011 are shown in the table below. Dankort payments accounted for the largest number while the largest value was accounted for by credit transfers. Central-government payments such as block grants to the municipalities and corporate VAT payments to the central government are handled in the Sumclearing and make a significant contribution to the total value settled in the Sumclearing.

PAYMENTS SETTLED IN THE SUMCLEARING IN 2011		Table 1
Unit	Number (million)	Value (kr. billion)
Dankort, VisaDankort and cash cards	990.4	337.3
Betalingservice and International payment cards	194.3	618.3
Credit transfers	226.8	81.2
Inpayment forms	182.8	3,377.6
Cheques	112.1	1,205.6
Total	4.1	97.8
	1,710.5	5,717.8

Source: Danish Bankers Association and Nets.

#### 2.4.1 Electronic clearing and truncation

Electronic clearing and truncation comprises only transactions registered with one participant and involving customers who have accounts with other participants.

All payments under electronic clearing and truncation are data captured from the participants and continuously sent to their respective data processing centres. On the basis of this data, the data processing centres generate overviews of the connected participants' transactions. These overviews are exchanged bilaterally between the data processing centres. Subsequently, the data processing centres generate credit and debit balances (sum totals) for each of the connected participants vis-à-vis the other participants. By 1:00 a.m., the data processing centres must submit sum totals to Nets where they are used in the Sumclearing. The data processing centres play a key role in electronic clearing and truncation in respect of compilation, processing and detailed bookkeeping on behalf of the participants.

## 2.4.2 PBS clearing

In PBS clearing, Nets compiles the transactions centrally and calculates the participants' outstanding accounts. Nets prepares credit and debit balances (sum totals) for each participant vis-à-vis the other participants. These sum totals are included in the calculation of net positions in the Sumclearing.

Nets submits information about retail payments to the data processing centres prior to clearing and settlement. In February 2011, Nets reorganised both Betalingsservice and LeverandørService to ensure that retail payments are not booked by the data processing centres prior to settlement. In consequence, settlement of Betalingsservice and LeverandørService is now carried out on the same conditions as Nets' other products.

## 2.5 SETTLEMENT PROCEDURE IN THE SUMCLEARING

In the Sumclearing, the actual exchange of funds between the participants takes place via accounts at Danmarks Nationalbank. The Sumclearing comprises the 1st and 2nd normal settlement cycles and the 1st and 2nd extra settlement cycles. In addition, extraordinary settlement cycles may be arranged by agreement between the Danish Bankers Association and Danmarks Nationalbank. The settlement cycles in the Sumclearing are shown in Table 2 and described below.

OVERVIEW OF SETTLEMENT CYCLES IN THE SUMCLEARING Table 2

Settlement	Deadline for participants' transfers to settlement accounts	Deadlines for supply of		
		Sum data	Lines	Book-entry basis
1st normal settlement .....	4:30 p.m.	1:00 a.m.	1:30 a.m.	2:00 a.m.
2nd normal settlement .....	N/A	2:30 a.m.	3:00 a.m.	3:30 a.m.
1st extra settlement .....	N/A	5:30 a.m.	6:00 a.m.	6:30 a.m.
2nd extra settlement .....	8:45 a.m.	5:30 a.m.	8:55 a.m.	9:15 a.m.

Note: Sum data is supplied by the data processing centres to the Sumclearing (Nets), lines by Danmarks Nationalbank to the Sumclearing and the book-entry basis by the Sumclearing to Danmarks Nationalbank.

Source: Danish Bankers Association's *Håndbog for Betalingsformidling*.

### 2.5.1 Normal settlement cycles

For the 1st normal settlement cycle, sum data from electronic clearing and truncation and PBS clearing must be submitted to the Sumclearing by 1:00 a.m. This is also the deadline for when individual payments



become irrevocable. The Sumclearing compiles each participant's net position by adding the sum totals received.

The Sumclearing then compares the participants' net positions with their lines, which must be received from Danmarks Nationalbank by 1:30 a.m. If all participants have cover for their net positions, by 2:00 a.m. the Sumclearing notifies Danmarks Nationalbank (in practice via its data processing centre, BEC) of these positions as the book-entry basis for the 1st normal settlement cycle. Danmarks Nationalbank exchanges the funds between the participants' Sumclearing accounts and sends confirmation to Nets.

If a participant does not have cover for its net position, the participant in question is removed from the settlement (postponed), and new net positions are calculated for the other participants.

When settlement confirmation has been received from Danmarks Nationalbank, Nets sends a Standard Status Record (SSR) to the data processing centres, notifying them of the participants that have been settled. The data processing centres then book the retail payments of the participants in question and their indirect participants.

Between the 1st and 2nd normal settlement cycles, the Sumclearing can receive delayed sum totals from the data processing centres and Nets. The deadline for these deliveries is 2:30 a.m. Along with postponed sum totals from the 1st normal settlement cycle, they form the basis for the calculation of the participants' net positions in the 2nd normal settlement cycle.

The procedure from the 1st normal settlement cycle is then repeated. The Sumclearing must receive lines from Danmarks Nationalbank by 3:00 a.m.<sup>1</sup> The 2nd normal settlement cycle must be completed and the book-entry basis submitted to Danmarks Nationalbank by 3:30 a.m. When amounts have been exchanged between the participants' Sumclearing accounts, Danmarks Nationalbank again sends confirmation to Nets, which notifies the data processing centres of the retail payments that can be entered.

### **2.5.2 Extra settlement cycles**

The Sumclearing runs a 1st extra settlement cycle in the case of postponed transactions and/or delayed sum totals are received after the 2nd normal settlement cycle. The same procedures apply to the 1st extra settlement cycle as to the normal settlement cycles.

---

<sup>1</sup> Between the night-time settlement cycles, the participants' lines may change as a result of their net positions in previous settlement cycles and credit under the automatic collateralisation arrangement, which has been reserved earlier in the clearing day, but not realised.

If, after the 1st extra settlement cycle, postponed transactions remain, a 2nd extra settlement cycle is run. No new sum totals are accepted for this settlement cycle. Participants whose transactions have been postponed and participants with negative net positions must ensure that they have sufficient liquidity in their Sumclearing accounts for the 2nd extra settlement cycle. Via the online system, CG-online (Clearing Approval), participants can see how much liquidity they need for the 2nd extra settlement cycle.

Participants can ensure that they have liquidity for the 2nd extra settlement cycle in two ways. From 7:00 a.m., when Kronos opens, until 8:45 a.m. they can transfer liquidity from their current account to their Sumclearing account or they can choose to "deselect emptying" in the Kronos application. The advantage of "deselect emptying" is that the Sumclearing account is not emptied until after the completion of the Sumclearing process. The disadvantage is that the participant ties up liquidity in the Sumclearing and therefore cannot use this liquidity for e.g. periodic payments in VP Securities (VP35) or for settlement of foreign-exchange transactions in CLS.

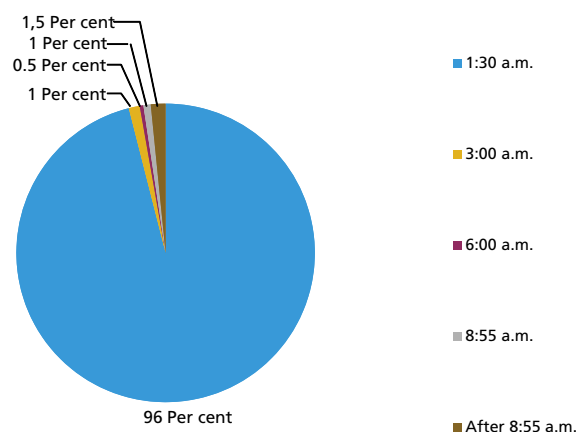
Danmarks Nationalbank sends new lines to the Sumclearing by 8:55 a.m. The settlement cycle must be completed and the book-entry basis submitted to Danmarks Nationalbank by 9:15 a.m.

### **2.5.3 Extraordinary settlement cycles**

If the Sumclearing is not completed after the 2nd extra settlement cycle, the Danish Bankers Association and Danmarks Nationalbank may agree to run extraordinary settlement cycles. This may be necessary if there are postponed sum totals from the 2nd extra settlement cycle, or delayed sum totals are not received until after the deadline for the 1st extra settlement cycle. The Danish Bankers Association will then set deadlines for submission of sum totals to the Sumclearing and transfer of liquidity to Sumclearing accounts. Participants must ensure that there is sufficient liquidity in their Sumclearing accounts.

### **2.5.4 Distribution of settlement cycles in 2011**

The majority of transactions are settled in the 1st normal settlement cycle at 1:30 a.m., cf. Chart 5. Therefore, on most days, there is only one settlement cycle in the Sumclearing.



Source: Danish Bankers Association and Nets.

Typically, delays in the data processing centres and at Nets are to blame for settlement occasionally not taking place until 3:00 a.m. and 6:00 a.m.

On days when settlement does not take place until 8:55 a.m. or later, this is due to postponements of participants' payments. In 2011, postponements in the Sumclearing occurred on six days, and on the day when the longest delay occurred, settlement was not completed until 10:02 a.m.

## 2.6 PRICES

Participants pay an access fee and an annual fee to the Danish Bankers Association to participate in the payment system.

Access fee in 2011:

- A fee of kr. 3.45 million is paid on the acceptance of the payment system agreements for participation in the payment system.
- A registration fee of kr. 92,500 is paid for membership of the Danish Bankers Association.

In 2011, the annual fee for participation in the Sumclearing was kr. 25,000. The fee is collected by Nets and is adjusted every year on 1 January.

## **2.7 MODERNISATION OF RETAIL PAYMENTS INFRASTRUCTURE**

---

Until the end of 2014, the Danish payments infrastructure will undergo modernisation measures to ensure faster settlement of retail payments. The modernisation will be implemented in four areas: 1) faster settlement of Dankort transactions made during the weekend, 2) better options for fast settlement of large payments via Danmarks Nationalbank's RTGS system, Kronos, 3) possibility of intraday settlement of credit transfers on banking days, and 4) fast settlement of small payments 24/7/365.

The first two measures have been implemented. The acceleration of the retailers' receipt of Dankort payments made during the weekend has been achieved by including these Dankort payments in the 1st extra settlement cycle on Monday morning at 6:00 a.m. instead of in the 1st normal settlement cycle at 1:30 a.m. during the night between Monday and Tuesday. The possibility for firms to make transfers in excess of kr. 1 million via Kronos has also been implemented.

Moreover, under the third and fourth measures, two new systems for settlement of credit transfers will be introduced. With the first new system – the Intradagclearing – more daily settlement cycles will be introduced entailing that transfers made on banking days are received by the recipient later the same day. The Intradagclearing will be implemented in 2013. With the second new system, due to be implemented in 2014, it will be possible to transfer amounts that, up to a certain limit, will be credited to the recipient's account immediately.

The modernisation measures are described in more detail in Report on domestic payment transfers in Denmark published by the Working group on domestic payment transfers in January 2012. Following the modernisation, the Danish payments infrastructure will match those of comparable countries.

---

## 3. Assessment of the Sumclearing

---

### 3.1 CORE PRINCIPLE I – LEGAL BASIS

---

*The system should have a well-founded legal basis under all relevant jurisdictions.*

#### 3.1.1 Assessment

Observed.

It is assessed that Danish legislation and regulations and the contractual basis for the Sumclearing provide a consistent, complete and reliable legal basis for the Sumclearing. So far, the legal basis has been sufficient to handle critical situations.

In pursuance of section 57a(5) of the Danish Securities Trading Act, the Danish Bankers Association must notify Danmarks Nationalbank of the direct and indirect participants in the system and any changes thereof. So far, the Danish Bankers Association has notified Danmarks Nationalbank only of changes concerning direct participants. In future, the system owner must also notify Danmarks Nationalbank of changes concerning indirect participants in the Sumclearing

#### 3.1.2 Justification

The legal basis for the Sumclearing comprises:

- Legislation<sup>1</sup>
- The contractual basis for the Sumclearing

##### **Legislation**

The legislation relevant to the Sumclearing is set out in, for instance, Danish law of contracts and property and in the provisions of the Danish Securities Trading Act implementing the Settlement Finality Directive. Relevant provisions are described below:

---

<sup>1</sup> All legislation, etc., adopted by the Folketing (Danish Parliament), is publicly available (in Danish) at [retsinformation.dk](http://retsinformation.dk). In addition, key financial sector legislation is available in English at the website of the Danish Financial Supervisory Authority at [www.finanstilsynet.dk](http://www.finanstilsynet.dk).

### **General law of contracts and property**

Danish law of contracts and property recognises and, to a very wide extent, protects agreements and other legal acts between parties (freedom of contract, simple contracts, freedom of evidence and access to immediate enforced realisation of collateral). In addition, electronic communication is recognised as valid legal acts and is accepted as evidence by Danish courts. Under Danish insolvency law, insolvency orders enter into force from the moment they are handed down. Moreover, zero-hour rules, according to which transactions executed after midnight are automatically rendered null and void, have never existed in Danish insolvency law. In consequence, transactions entered in the system are settled irrespective of a participant's possible insolvency. This is supported by the fact that Danmarks Nationalbank guarantees the liquidity of the participants (against collateral) during settlement.

### **Rules of law**

The specific legal regulation of payment systems in Denmark, including the Sumclearing, is found in the Securities Trading Act, title 3, particularly part 18 on payment systems, netting, etc., sections 57 and 57 a-e. The Danish Securities Trading Act implements Directive 98/26/EC on settlement finality in payment and securities settlement systems (the Settlement Finality Directive). The Sumclearing has been registered and notified (designated) in accordance with the rules of the Directive, cf. below.<sup>1</sup> All participants in the Sumclearing are comprised by the Settlement Finality Directive.

Under the Settlement Finality Directive, transfer orders and netting are legally enforceable and binding on third parties (e.g. an insolvent estate) in the event of insolvency proceedings against a participant, provided that the orders are entered in the system before the insolvency proceedings are opened. The Directive also stipulates that the rules of the system determine when an order has been entered. Furthermore, it is emphasised that an order can no longer be revoked by a participant or a third party after a point in time established by the system.

Since 1 January 1996, section 57 of the Danish Securities Trading Act has contained a provision on multilateral netting in relation to, e.g., payment systems. This provision allows a netting agreement to specify that transfer orders entered into a system must be netted, cleared and settled or reversed in the event of the insolvency of a party. The only preconditions are that the Danish Financial Supervisory Authority is

---

<sup>1</sup> The notification provision in Article 10 of the Directive is implemented in section 57d of the Danish Securities Trading Act.

notified of the agreement (in case of payment systems of significant importance to payment settlement, the agreement must be sent to Danmarks Nationalbank) and that it includes objective conditions for cases in which transfer orders must be satisfied in accordance with the netting agreement or reversed.

These provisions were not amended significantly in connection with the Danish implementation of the Settlement Finality Directive by way of Act 283/2000. However, it was specified in section 57c of the Danish Securities Trading Act that the contractual basis of a system must stipulate when a transfer order is considered to have been booked in the system, and the point in time after which it can no longer be revoked by a participant or a third party.

The conditions for registering and notifying a system under the Settlement Finality Directive are stated in section 57a of the Danish Securities Trading Act. In addition to the requirements set out in section 57c, the contractual basis must state, e.g., that the system is subject to Danish law, who can be a direct or indirect participant in the system and the requirements regarding collateral and provision of collateral with a view to ensuring settlement in the system. The Sumclearing meets these requirements and has been registered and notified in accordance with the Settlement Finality Directive.

The Settlement Finality Directive also includes a conflict of laws rule to ensure that the insolvent estate of a participant cannot, referring to the insolvency legislation of its home country, prevent agreements which the insolvent participant has concluded with the system from being effected. In such cases the insolvency legislation governing the system applies. This provision has been implemented in section 57e of the Danish Securities Trading Act.

Pursuant to sections 70(1) or 72(2) of the Danish Insolvency Act, collateral for credit facilities cannot be declared null and void.<sup>1</sup> This is stipulated in section 57b(1) of the Danish Securities Trading Act (which implements Article 9 of the Settlement Finality Directive) according to which collateral security provided to a payment system registered in accordance with section 57a, a clearing centre or Danmarks Nationalbank is not affected by the insolvency of a participant.

### **Contractual basis**

The contractual basis for participation in and operation of the Sumclearing comprises

---

<sup>1</sup> It is a precondition, however, that the collateral is pledged without undue delay after the lack of collateral occurred, and the collateral must be pledged according to normal procedures.

- The Danish Bankers Association's participation agreement with the participants
- Danmarks Nationalbank's terms and conditions for accounts (documentation basis for monetary-policy instruments and settlement of payments in DKK, EUR, SEK and ISK)
- Settlement agreement and procedures between the Danish Bankers Association and Danmarks Nationalbank
- Agreement between the Danish Bankers Association and Nets concerning the operation of the Sumclearing

The *participation agreement* between the Danish Bankers Association and the participants includes provisions concerning e.g. access criteria, responsibilities, payments by participants, and legal venue and governing law. The participation agreement refers to the provisions set out in *Håndbog for Betalingsformidling*, which contains the above deadlines for when a transfer order is considered to have been entered in the system, and the point in time after which it can no longer be revoked. The content of *Håndbog for Betalingsformidling* is described in more detail in section 4.2.

The participation agreement also contains a netting agreement that has been submitted to Danmarks Nationalbank. On the basis of objective criteria, the netting agreement specifies when the positions compiled in the Sumclearing must be settled in the participants' accounts at Danmarks Nationalbank or be reversed in full. The agreement thereby meets the requirements set out in section 57 of the Danish Securities Trading Act.

Under the participation agreement, the Danish Bankers Association can require documentation (a legal opinion) from foreign participants that the terms and conditions of the agreement are legally enforceable vis-à-vis the individual participant. This also applies in relation to the netting agreement and to any insolvent estates and creditors of foreign participants. As a consequence of the Settlement Finality Directive, these provisions are primarily relevant for foreign participants outside the EU/EEA.

The agreement also contains a provision enabling the Danish Bankers Association to exclude a participant in the event of breach of the payment system agreements. So far, it has not been necessary to exclude a participant and, in consequence, the provision has therefore not been tested in practice.

*Danmarks Nationalbank's terms and conditions for accounts* regulate any relationship between the account holders and Danmarks Nationalbank in connection with settlement of payments in Danish



kroner at Danmarks Nationalbank. By signing "Request for a Sumclearing account in Danish kroner at Danmarks Nationalbank", the account holder accepts the terms and conditions for accounts in the Sumclearing. The terms and conditions for accounts are supplemented by the rules of participation in and use of Kronos, which can be found at Danmarks Nationalbank's website. Danmarks Nationalbank's terms and conditions for accounts and rules for connection are publicly available, e.g. at Danmarks Nationalbank's website.

The *settlement agreement* between the Danish Bankers Association and Danmarks Nationalbank describes the terms for cash settlement via the participants' accounts at Danmarks Nationalbank. The contractual basis specifies the services to be performed by each party and when and how these services are to be performed, and includes contingency procedures, as well as provisions on how the participants are to act in the event of insolvency, etc. among the participants. The key element of the agreement is that, prior to settlement, Danmarks Nationalbank submits the lines of each participant to the Sumclearing and guarantees these lines during settlement. The settlement agreement and the procedures entered into force on 19 May 2008 and replaced the agreement on terms and conditions for settlement of payments at Danmarks Nationalbank in connection with the commencement of the Sumclearing on 17 May 1999.

The *agreement between the Danish Bankers Association and Nets* concerning the operation of the Sumclearing establishes the extent of and the terms and conditions for Nets' administration and execution of the Sumclearing and other tasks handled by the Danish Bankers Association on behalf of Danmarks Nationalbank and the participants in relation to the Sumclearing at Nets and the settlement thereof at Danmarks Nationalbank. The agreement entered into force on 17 May 1999.

### **Participation in the Sumclearing**

To gain access to the payments infrastructure, a potential participant must accept a set of mandatory agreements, which are identical for direct and indirect participants. In addition, direct participants must enter into a number of additional agreements with the Danish Bankers Association and accept the terms and conditions for accounts in the Sumclearing. The overall terms and conditions are stipulated in the agreements between the Danish Bankers Association and the participants. The terms and conditions for the settlement of indirect participants' payments are agreed separately between the direct and the indirect participant.

The Danish Bankers Association notifies Danmarks Nationalbank of changes concerning direct participants. Under section 57a(5) of the Danish Securities Trading Act, the Danish Bankers Association must notify Danmarks Nationalbank of the direct and indirect participants in the system and any changes thereof.<sup>1</sup> In consequence, the system owner should in future also notify Danmarks Nationalbank of any changes concerning the indirect participants in the Sumclearing.

#### **Term of notice**

The Danish Bankers Association has introduced a 3-month term of notice for contractual relationships between direct and indirect participants with the purpose of providing the indirect participant with sufficient time to enter into an agreement with another direct participant. The Danish Bankers Association basically considers the establishment of terms and conditions for settlement of the indirect participant's payments as a matter exclusively pertaining to the mutual relationship between the direct and the indirect participant. In consequence, the Danish Bankers Association has not specified any required terms and conditions for agreements concluded between direct and indirect participants. A term of notice preventing an indirect participant from continuing as a direct or indirect participant in the Sumclearing will, however, have serious consequences for the indirect participant. Therefore, a proportional term of notice has been introduced for agreements between direct and indirect participants.

#### **Resolution through the Financial Stability Company**

Act No. 721 of 25 June 2010 makes provision for the resolution of a distressed bank through the Financial Stability Company as an alternative to insolvency. If a distressed bank chooses to be taken over by the Financial Stability Company under the resolution scheme (Bank Rescue Package 3), the Financial Stability Company forms and capitalises a new Financial Stability subsidiary, which acquires the assets and part of the liabilities of the distressed bank. In Kronos, resolution under Bank Rescue Package 3 is effected by the new institution taking over the former institution's account setup, including the settlement account for the Sumclearing, at unchanged terms. Once the Financial Stability Company has announced that the institution has been taken over by the Financial Stability Company, the other participants will be notified accordingly.

---

<sup>1</sup> Under the Settlement Finality Directive, it is assumed that the indirect participant is known by the system operator.

## 3.2 CORE PRINCIPLE II – UNDERSTANDING FINANCIAL RISKS

---

*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.*

### 3.2.1 Assessment

Observed.

The Danish Bankers Association's *Håndbog for Betalingsformidling* (payment systems manual) and *Aftalebog* (book of agreements) are available in Danish only. The system owner should consider whether there is a need for English versions of these documents.

### 3.2.2 Justification

#### **Description of the Sumclearing**

A memorandum on the Sumclearing is available in the open area of the Danish Bankers Association's website. The memorandum is updated at least once a year around New Year or as needed. The memorandum includes a description of the system, the most important rules and procedures, key risks and access criteria. The memorandum is available in both Danish and English.

#### **Manuals**

The rules and procedures for the Sumclearing are set out in the Danish Bankers Association's *Aftalebog*, Volume I, and *Håndbog for Betalingsformidling*. *Aftalebog* comprises the participation agreement as well as the most important agreements between the banks in relation to payment systems (the common contractual basis). *Håndbog for Betalingsformidling* provides detailed descriptions of procedures and formats for data exchange in the Sumclearing and the two underlying subclearings, the settlement procedure in the Sumclearing, requirements in terms of participants' business procedures, the system owner's opportunities to levy fines, etc.

The rules and procedures for settlement of the cash leg of the Sumclearing are described in the Agreement between the Danish Bankers Association and Danmarks Nationalbank (the settlement agreement) with the pertaining procedures, while the provisions concerning cash settlement at Danmarks Nationalbank are stated in

Danmarks Nationalbank's terms and conditions for accounts, which are published in Danish and English at Danmarks Nationalbank's website.

*Håndbog for Betalingsformidling* comprises a simple and comprehensive description of the basic structure of the Sumclearing and a payment's route through the system. With the participation and settlement agreements, *Håndbog for Betalingsformidling* also provides a clear description of the responsibilities and obligations of the participants and other involved parties. On the basis of the rules and procedures of the Sumclearing, participants can thus gain a clear overview of the risks incurred by participating in the Sumclearing.

Under the participation agreement, the Danish Bankers Association is entitled to amend *Håndbog for Betalingsformidling* without notice; such amendments must not apply to an ongoing settlement cycle, however. In other words, the system owner can unilaterally amend system rules and procedures in areas relating to the content of *Håndbog for Betalingsformidling*. In addition, the participation agreement entitles the Danish Bankers Association, without notice, to agree on amendments to the settlement agreement with Danmarks Nationalbank.

*Håndbog for Betalingsformidling* and *Aftalebog* are available in electronic form in Danish. The system owner should consider whether there is a need for English versions of these documents.

The Danish Bankers Association undertakes regular maintenance of the infrastructure and as a result of this updates and performs quality assurance of the above-mentioned documents. Maintenance activities are anchored in a number of permanent working groups under the auspices of the Danish Bankers Association; meetings are held every year according to a pre-set meeting schedule. Procedures have also been established to ensure a quarterly update of *Håndbog for Betalingsformidling* to ensure the required quarterly update of the information in Appendix 1.

#### **Information about changes and new measures in the Sumclearing**

Changes and measures in the Sumclearing are undertaken by the Danish Bankers Association's permanent working groups in the area and in close dialogue with relevant stakeholders. The working groups are composed of representatives from Nets, the data processing centres, the Association of Local Banks, Savings Banks and Cooperative Banks in Denmark, the Danish Regional Bankers' Association and other selected members. The data processing centres, the Association of Local Banks, Savings Banks and Cooperative Banks in Denmark and the Danish Regional Bankers' Association ensure regular contact with and provide

information to members not participating in the working groups. In addition, information is regularly provided to other stakeholders, including Danmarks Nationalbank.

When, on the basis of a previous review process, it is decided to implement changes or new measures, the Danish Bankers Association makes a formal announcement, typically in the form of a letter to management. All participants in the infrastructure and other relevant stakeholders receive the Danish Bankers Association's letters to management.

### **Education and training**

The need for education and training of new participants and new employees varies. Focus is mainly on the education and training of new direct participants and on the daily operation of the system.

Requirements for direct participants in connection with the daily operation are described in sections 4.5.8.3 and 4.10, Chapter 4, in *Håndbog for Betalingsformidling*. New participants receive *Håndbog for Betalingsformidling*, and in the framework agreement "Participation in electronic clearing and truncation" reference is made to the instructions in *Håndbog for Betalingsformidling* which participants must follow. Other requirements are also set out in *Håndbog for Betalingsformidling*. In addition, new participants are in dialogue with their data processing centre, Danmarks Nationalbank and Nets. This dialogue ensures that new participants are sufficiently informed to participate in the clearing.

New employees who will be participating in the handling of the Sumclearing are educated and trained by the Danish Bankers Association. Educational and training sessions are arranged with the participant's executive who is responsible for participation in the Sumclearing.

### **Term of notice**

The individual agreements in the payment system area each have their term of notice. As no distinction is made between direct and indirect participants in the payment system agreements, all participants have the same term of notice.

### 3.3 CORE PRINCIPLE III – MANAGEMENT OF FINANCIAL RISKS

---

*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.*

#### 3.3.1 Assessment

Broadly observed.

The procedures of the Sumclearing concerning reconstruction and insolvency ensure that major credit risks between the participants do not occur. However, the risk of postponements during the night-time settlement involves a liquidity risk for the participants. The liquidity risk is limited by the low alternative costs of reserving sufficient liquidity as well as by the Danish Bankers Association's fining system and the individual limits on payments settled in the system. However, in order to enhance the resilience of the system to financial stress and any liquidity shortage, more intraday settlement cycles should be introduced, as recommended by the IMF in 2006. This would reduce the net positions of participants and the manual procedures of the 2nd extra settlement cycle would be avoided. Moreover, participants should be notified of their expected net payment obligations for the settlement, and the reservation of liquidity should be made more flexible. The ongoing modernisation of the Danish retail payments infrastructure will accommodate these recommendations.

#### 3.3.2 Justification

##### **Credit risk**

Credit risk in payment systems is the risk of loss due to another participant's failure to meet its obligations, either at the time of settlement or at a later time. Credit risk may occur in the period from the system's acceptance of a payment until its final settlement.

In principle, credit risks do not occur between participants in the Sumclearing. The reason is that when a participant is unable to meet its obligations in the Sumclearing, all payments to and from that participant are removed from the settlement cycle, which is subsequently completed for the remaining participants. In addition, retail transactions are not booked to the customers' accounts until settlement has been completed. This ensures that customers do not have

amounts received at their disposal until the amount has been finally transferred to the customer's bank.

With effect from 10 February 2011, Betalingservice and LeverandørService were reorganised to ensure that the book-entry date and the settlement date are the same. Prior to the reorganisation, transactions were booked one day before the actual exchange of funds, which entailed, cf. above, a credit risk as already booked but not settled transactions would have to be reversed in the event of insolvency or reconstruction of one of the banks involved.

In principle, customers' access to withdraw cash from other banks involves a credit risk between the participants in the Sumclearing as the funds are not transferred from the customer's bank to the payer's bank until the next settlement cycle. The risk is limited, however, by an upper limit for cash withdrawals.

Since the Sumclearing uses central-bank money for settlement, direct participants incur no credit risk on the settlement bank. Indirect participants hold accounts with a direct participant and use the direct participant as settlement bank. This involves a credit risk pertaining to the outstanding accounts between the direct and indirect participants, cf. the section on direct and indirect participants below.

### **Liquidity risk**

Liquidity risk is the risk of loss because the liquidity of one of the participants is insufficient to meet its obligations at the expected time entailing that other participants do not receive their expected liquidity in due time.

When participants in the Sumclearing provide liquidity for the night-time settlement cycles, they do not know their net position for the night-time settlement. They therefore estimate or make a forecast of their liquidity requirement and normally reserve more liquidity than their expected requirement. If the settlement of a participant in the Sumclearing is postponed due to lack of liquidity, new net positions are calculated for the other participants. This may involve that the settlement of other participants' payments must be postponed during the night-time settlement. Postponements during the night-time settlement entail that the Sumclearing cannot be completed until the following morning, when participants with postponed payments can add additional liquidity for the settlement. The risk of postponements therefore involves a liquidity risk for the participants.

The liquidity risk is limited by the currently low alternative costs of reserving sufficient liquidity, ensuring that participants prefer to reserve large amounts, cf. Chart 3, page 12, thereby reducing the risk of

postponements. In addition, the fining system and the participants' individual limits, cf. below, contribute to reducing liquidity risks in the system.

However, in order to enhance the resilience of the system to financial stress and any liquidity shortage, more intraday settlement cycles should be introduced as recommended by the IMF in 2006. As pointed out by the IMF, this would reduce the participants' net positions and thereby the liquidity risk. This implies that participants whose payments are postponed in the night-time settlement are automatically transferred to the next normal settlement cycle, thereby avoiding the manual procedures applied in the 2nd extra settlement cycle. At the same time, the risk of postponements in the night-time settlement is reduced by the participants being notified of their expected net payment obligations in advance and by introducing more flexible options for reserving liquidity for the settlement.

The ongoing modernisation of the Danish retail payments infrastructure is expected to accommodate these recommendations. As part of the modernisation process, more intraday settlement cycles of credit transfers will be introduced, along with improved liquidity management options.

#### **Incentives for timely settlement procedures**

Participants will be fined in connection with postponements resulting from insufficient liquidity cover. In addition, they will be instructed to describe the course of events. The purpose of the fining system is to reduce the number of postponements, thereby reducing the liquidity risk in the system as much as possible. A participant will be fined kr. 10,000, 15,000 and 25,000 for the 1st, 2nd and 3rd postponements, respectively, in a 12-month period. When a participant's payments are postponed for the 4th time in a 12-month period, the Danish Bankers Association will determine the size of the fine.

The terms and conditions applying to fines are described in sections 4.5.8.3 and 4.10, Chapter 4 of *Håndbog for Betalingsformidling* and in section 4.1 in the memorandum on the Sumclearing.

#### **Limits on individual payments**

Both direct and indirect participants are instructed to introduce limits on debit and credit transactions. In practice, this establishes a ceiling for the individual participants' payments with the purpose of reducing liquidity risks. Participants are requested to set debit limits of between kr. 0-100 million. The limit can be higher if justified. As for the credit limit, participants are requested to set a limit that is twice the size of the



largest single transaction handled by the participant in the past year. Transactions exceeding the credit limit can be effected via Denmark's Nationalbank's RTGS system, Kronos.

The Danish Bankers Association reserves the right to assess the limits of the individual participant. In this way, the procedures ensure that the system owner is notified of the participant's limits in connection with changes or when new participants report their limits for the first time.

#### **Direct and indirect participants**

Indirect participation in the Sumclearing entails that mutual financial risks are incurred by the direct and the indirect participants. These risks are limited by the debit and credit limits in the system and the procedures for handling reconstruction and insolvency. There are no known incidences of the financial risks relating to indirect participation impacting on the Sumclearing.

Credit risk occurs when e.g. an indirect participant deposits liquidity with a direct participant for the night-time settlement. If the direct participant becomes subject to reconstruction or becomes insolvent before the completion of the Sumclearing, the deposited liquidity becomes part of the direct participant's insolvent estate and may be fully or partly lost.

The opposite may also be the case if an indirect participant is to transfer liquidity to the direct participant after completion of the Sumclearing. If the indirect participant becomes insolvent after completion of the Sumclearing but before the liquidity transfer to the direct participant, then the direct participant will be exposed to credit risk.

In addition, an indirect participant can subject its direct participant to liquidity risk by having a larger-than-expected negative net position in the night-time settlement cycle. However, there are no known incidences of postponement of a direct participant's payments in the Sumclearing as a result of the indirect participant having a larger-than-expected negative position.

The contractual relationship between a direct and an indirect participant is neither regulated by the payment system agreements nor by *Håndbog for Betalingsformidling*. Therefore, the parties have been instructed to design their risk management systems to allow for the risks that may be incurred as a direct or indirect participant.

In general, the debit and credit limits contribute to reducing the mutual financial risks incurred by direct and indirect participants. In addition, the procedures for reporting limits require that the limits of an indirect participant must be approved by the direct participant, allowing

the direct participant to assess the financial risks incurred on behalf of the indirect participant.

Under the existing practice of handling reconstructions and insolvencies, the participant in question is removed from the clearing, which to a large extent prevents the participants from exposing each other to financial risks.<sup>1</sup> When a participant is removed from the clearing, transactions to and from that participant will be stopped, and transactions debited to that participant's account will be reversed. Since payments to and from the participant subject to reconstruction or insolvency are not settled, neither direct nor indirect participants are exposed to financial risks in these situations.

If a direct participant becomes insolvent or cannot meet its obligations, the indirect participant(s) connected to the direct participant in question will be removed from the Sumclearing together with the direct participant, cf. section 4.5.11.7, *Håndbog for Betalingsformidling*. An indirect participant who is removed from the Sumclearing together with an insolvent direct participant may re-establish its access to the infrastructure by becoming a direct participant or by concluding an agreement with another direct participant.

#### **Resolution through Finansielt Stabilitet**

In Denmark, a winding-up company, Finansielt Stabilitet, has been established and incentives created to find solutions in the sector in the event that a participant encounters financial problems. The board of a distressed bank will typically find it appropriate to enter into an agreement with the Financial Stability Company for a resolution of the bank to avoid reconstruction or insolvency. On the conclusion of a resolution agreement, the bank's operations continue unchanged, including the participation in the Sumclearing, thereby avoiding the financial risks that direct as well as indirect participants could inflict on the Sumclearing in connection with insolvency. Accordingly, it would be desirable if banks threatened by insolvency would be sure to seek resolution through the Financial Stability Company. Pursuant to the Danish Financial Stability Act, banks are under no obligation to declare whether they are interested in resolution through the Financial Stability Company. At this point in time, the majority of the banks have not declared what type of resolution they prefer.

---

<sup>1</sup> The procedures are described in section 4.5.11, Chapter 4, *Håndbog for Betalingsformidling*.

**New principles**

In April 2012, the BIS published new international principles for oversight of payment and settlement systems, cf. also page 4. The new principles sharpen the focus on the significance of indirect participants in payment or settlement systems. Under the new principles, system owners must to a greater extent identify, understand and manage the risks associated with indirect participation. In addition, it must be ensured that rules and procedures allow the procurement of information on indirect participants.

## **3.4 CORE PRINCIPLE IV – PROMPT FINAL SETTLEMENT**

---

*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.*

### **3.4.1 Assessment**

Observed.

The deadlines for submission of sum totals for the individual settlement cycles in the Sumclearing and the final settlement times are stated in Chapter 4 of Håndbog for Betalingsformidling. A payment is considered to be accepted if it has been entered in the system by 1:00 a.m. Settlement finality occurs when the Sumclearing settlement is complete, typically at 1:30 a.m. If a participant's payments are postponed in the 1st normal settlement cycle and not settled until the 2nd extra settlement cycle at 8:55 a.m., the interval is somewhat longer, but payments are still settled within the same day.

### **3.4.2 Justification**

#### **Settlement cycles in the Sumclearing**

There are four planned settlement cycles in the Sumclearing: the 1st and 2nd normal settlement cycles and the 1st and 2nd extra settlement cycles, which are executed at 1:30 a.m., 3:00 a.m., 6:00 a.m. and 8:55 a.m., respectively. The latter three settlement cycles act as back-up in the event that it is not possible to complete the Sumclearing after the 1st normal settlement cycle.

#### **Netting rules**

Nets must submit sum data from the PBS clearing and the data processing centres from electronic clearing and truncation for Clearing Approval by the notification time at 1:00 a.m. The netting rules ensure that sum data submitted by the notification time cannot be changed. Therefore, a payment is considered to be accepted if it has been entered in the system by 1:00 a.m. However, by agreement with Nets, it is possible to submit sum data for the 2nd normal settlement cycle by 2:30 a.m. and for the 1st and 2nd extra settlement cycles by 5:30, cf. Table 2 in section 2.5.

**Finality**

In general, a payment is considered to be final when the Sumclearing is complete, cf. the Agreement specified in section 2.1. The Sumclearing is considered complete when funds have been exchanged in the participants' settlement accounts at Danmarks Nationalbank. Since the Sumclearing is usually completed in the 1st normal settlement cycle at 1:30 a.m., settlement finality typically occurs at this time.

However, specific reversal rules apply to a number of payment instruments, which has a bearing on the finality issue. These rules imply that under certain specific conditions a creditor must accept the reversal of a payment. Thus, in connection with Betalingservice, debtors are entitled to claim reversal of a payment for up to 7 days after the amount has been debited the debtor's account.

**Delays**

The submission of sum data is only rarely troubled by technical problems or delays. In such a situation, the participant's payments will be transferred to the next planned settlement cycle. As a result, the completion of the Sumclearing and the subsequent execution of the retail clearing are delayed. Completion by the 2nd normal settlement cycle does not cause any problems for the customers as the booking may still be completed at around 6:00 a.m. If the technical problems or delay of the sum data persist at the 2nd normal settlement cycle, the Sumclearing will seek to settle transactions in the 1st extra settlement cycle.

The 2nd extra settlement cycle is mainly used for postponed payments in the Sumclearing due to lack of liquidity in the participants' settlement accounts.

The four settlement cycles are to ensure that the Sumclearing can be settled within the same day. If the Sumclearing cannot be completed using the four planned settlement cycles, it is possible to arrange extraordinary settlement cycles. However, the latest possible settlement of the Sumclearing is at 3:00 p.m.

**Incorrect payments**

Incorrect payments that have been accepted and settled in the Sumclearing cannot be corrected within the same day by, e.g. reversing the payment and executing the right payment in a later cycle the same day. The reason is that the Sumclearing only settles payments once a day. Incorrect payments that are corrected will therefore be settled in the Sumclearing cycle run the following night.

Incorrect payments are rarely submitted and settled with serious consequences for the Sumclearing. In the event of a single incorrect payment, a participant may correct the error by entering into a bilateral agreement with another participant for a reverse, real-time payment via Kronos.

### **3.5 CORE PRINCIPLE V – SETTLEMENT IN MULTILATERAL NETTING SYSTEMS**

---

*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.*

#### **3.5.1 Assessment**

Observed.

In accordance with the procedures of the Sumclearing, a participant failing to meet its obligations during the settlement is removed from the settlement, which is subsequently completed for the remaining participants. Danmarks Nationalbank has analysed settlement data for the Sumclearing for the period January 2011 to May 2012. The analysis shows that if the participant with the largest payment obligation is removed from the settlement, this will have no impact on the other participants on any days. However, it should be emphasised that the analysis also shows that it is key to the resilience of the system that participants ensure that they have sufficient liquidity cover.

#### **3.5.2 Justification**

If a participant in the Sumclearing is unable to settle its payments and its payments are postponed, the net positions of the remaining participants are recalculated. Subsequently, it may also be necessary to postpone other participants' payments because they are unable to cover their new net positions. Other things being equal, this risk will be greater if the participant whose payments were originally postponed has a substantial negative net position.

The Sumclearing has procedures to ensure that, as a rule, settlement can always take place in a timely manner, even though the payments of a participant with a large settlement obligation are postponed. The primary option in this respect is to run a 2nd extra settlement cycle, and possibly additional settlement cycles, for which extra liquidity can be provided since settlement takes place within Kronos' opening hours. To this should be added the participants' flexible access to intraday credit at Danmarks Nationalbank.

### **Reservation of liquidity**

Participants are obliged to ensure that they have sufficient liquidity for the settlement in the Sumclearing, cf. section 4.5.10, *Håndbog for Betalingsformidling*. In practice, participants usually reserve ample liquidity for the night-time settlement, cf. Table 1 in Chapter 2. As stated above, this reflects that there are no substantial alternative costs of providing liquidity for settlement. The extensive excess cover for the night-time settlement reduces the risk that – if the payments of a participant with a large net obligation have been postponed – the payments of other participants must be postponed when the net positions are recalculated.

In 2011, payments were postponed in the Sumclearing on 14 occasions. The reasons for the postponements were that one or more participants had failed to reserve sufficient liquidity. No participant's payments were postponed due to systemic risk, i.e. postponement of another participant's payments during the settlement. This confirms that the participants typically transfer sufficient liquidity to their settlement accounts.

In a few instances, the postponement of a single participant's payments indirectly caused the postponement of other participants' payments. These instances reflected that participants opting for automatic emptying of their settlement account at Kronos had failed to transfer new liquidity to their settlement account for the 2nd extra settlement cycle. If those participants also had negative net positions, their payments were postponed in the 2nd extra settlement cycle. In June 2012, the Danish Bankers Association sent letters to the management of participants drawing their attention to the problem of automatic emptying of settlement accounts.

In recent years, the Danish Bankers Association, at the request of Danmarks Nationalbank, has sent letters to the management of participants at the end of the year, urging them to reserve sufficient liquidity for settlement in the Sumclearing on the first banking day of the year, which is the largest settlement day in the Sumclearing due, in particular, to interest and mortgage payments.

### **Postponements**

A participant whose payments are postponed is contacted by telephone by the Danish Bankers Association at 8:00 a.m. and asked to transfer sufficient liquidity to the settlement account. Subsequently, the Sumclearing is typically completed in the 2nd extra settlement cycle. Fines are imposed on participants with postponed payments, cf. the



section on incentives for timely settlement procedures under Core Principle III - Management of financial risks.

#### **Completion of the Sumclearing**

If a participant's payments have been postponed and the dialogue during the day between the participant and the Danish Bankers Association suggests that the participant is not in a position to complete the settlement, the participant in question will be removed from the Sumclearing and payments to and from that participant will be reversed in full. Settlement will take place for the remaining participants. This situation has occurred only once. A participant's payments had been postponed in the Sumclearing due to a major incorrect transaction and it was assessed that it would not be possible to arrange an extraordinary settlement cycle. No other participants' payments had been postponed, and on that day the Sumclearing was completed without the participant in question. This incident resulted in extensive clean-up efforts at Nets and the individual banks and data processing centres and procedures have subsequently been introduced to limit this problem.

#### **Analysis of the resilience of the Sumclearing**

Danmarks Nationalbank has analysed the resilience of the Sumclearing to incidents where the participant with the largest payment obligation is removed from the settlement. The results of the analysis are summarised in Table 2. It appears that even if the participant with the largest payment obligation is removed from the settlement, this will have no impact on the other participants on any days – there will be postponements in 0 per cent of the settlement cycles. The same applies if the participant with the second-largest payment obligation is removed.

The results of the analysis emphasise the importance of the participants ensuring sufficient excess liquidity cover. If the excess cover is reduced, the number of postponements goes up sharply, both if the largest net debtor(s) or the participant with the largest payment obligation is/are removed from the settlement. It has no major significance if the participant who is closest to falling, i.e. has the lowest excess cover, is removed from the settlement.

POSTPONEMENTS AFTER REMOVAL OF PARTICIPANT(S)

Table 2

Share of settlement cycles with postponements, per cent	Largest payment obligation		Largest net debtor		Closest to falling	
	One participant	Two participants	One participant	Two participants	One participant	Two participants
	Actual excess cover .....	0.0	0.0	0.0	0.3 <sup>1</sup>	0.0
75 per cent of excess cover .....	0.0	0.5	0.0	0.8	0.0	0.0
50 per cent of excess cover .....	1.6	9.8	0.3	4.0	0.3	0.3
25 per cent of excess cover .....	7.2	38.0	6.1	20.5	0.3	1.6

Note: The analysis is based on data for the period 1 January 2011 to 31 May 2012. The table shows the total number of settlement cycles with postponements as a consequence of removal of participants according to the given rule. The largest payment obligation shows a gross position and is the participant who should reserve the largest amount for the settlement before any netting of the participant's payments. The participant with the largest payment obligation is therefore not necessarily the largest net debtor; the largest net debtor is the participant who after the calculation of net positions must submit the largest amount for the settlement. During the period under review, there were 68 participants and 354 settlement days (a total of 376 settlement cycles) in the Sumclearing.

Source: Own calculations.

<sup>1</sup> A relatively minor participant showed an irregular transfer of liquidity to the settlement account on one day, but was fortunate to be a net creditor on that day. When the two largest net debtors are removed, this picture changes and the participant's net position becomes negative and its payments are therefore postponed. This emphasises the importance of the participants transferring sufficient liquidity to their settlement accounts.

## 3.6 CORE PRINCIPLE VI – SETTLEMENT ASSETS

---

*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.*

### 3.6.1 Assessment

Observed.

The Sumclearing is settled in central-bank money.

### 3.6.2 Justification

#### **Direct participants**

The settlement of direct participants' net positions in the Sumclearing takes place via accounts at Danmarks Nationalbank. The balances in the participants' settlement accounts are claims on Danmarks Nationalbank, and consequently settlement takes place in central-bank money. Participants do not incur any credit risk on the settlement bank. In addition, Danmarks Nationalbank extends intraday credit for the Sumclearing settlement, which helps to reduce the liquidity risk.

#### **Indirect participants**

An indirect participant does not hold a Sumclearing settlement account at Danmarks Nationalbank. Instead, the indirect participant holds an account with a direct participant and can transfer liquidity to this account. This means that the indirect participant has an outstanding balance with the direct participant and does not use central-bank money. The indirect participant's retail payments are settled via the direct participant's settlement account at Danmarks Nationalbank. In connection with the settlement of retail payments, the indirect participant will therefore subject the direct participant to liquidity and credit risks. The risks are estimated to be insignificant in practice, and measures have been taken to ensure that the direct participant can assess these risks. Read more about these risks under Core Principle III.

#### **Participant status**

Participants may choose to be either direct or indirect participants in the Sumclearing. Participants opting to be direct participants may choose whether they want to enter into an agreement with an indirect

participant. Indirect participants may switch to another direct participant or become a direct participant themselves.

### 3.7 CORE PRINCIPLE VII – SECURITY AND OPERATIONAL RELIABILITY

---

*The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily settlement.*

#### 3.7.1 Assessment

Observed.

The operational stability of the Sumclearing is reflected in Nets' operational statistics which show Sumclearing availability of or close to 100 per cent.

The system operator, Nets, has a well-organised framework for operational risk management, based on international standards and recommendations. This means that operational risk analyses are made for all major changes and at least once a year. In keeping with the Security Policy, Nets has introduced measures to ensure the confidentiality, integrity and availability of the Sumclearing.

In accordance with the Clearing Approval, the Sumclearing must ensure transmission unrejectability. This is achieved through encryption of the transport channel between the sending and receiving data processing centres and by using a Message Authentication Code (MAC). A MAC ensures integrity and authenticity but not full unrejectability as any user who can verify a MAC is also able to generate a MAC. Therefore, both the sending and the receiving data processing centres are able to generate a MAC for delivery. Nets may consider an alternative method, e.g. asymmetric encryption, if they want to meet their own unrejectability criteria.

Nets has a dual strategy for business continuation consisting of a business contingency plan (Business Continuity Plan) drawn up and maintained by Nets, and a technical contingency plan (Disaster Recovery Plan) drawn up and maintained by IBM. Contingency plans are tested annually and are revised regularly to ensure that they are up-to-date and in keeping with actual conditions. Nets has entered into an agreement with IBM on the provision of two-centre operations, and switching of operations between the two data processing centres can be arranged within the agreed four-hour time frame.

International best practice is a time frame of a maximum of two hours. The system owner should regularly assess whether the time frame of a maximum of four hours for switching between the centres is still sufficient.

### 3.7.2 Justification

#### Security

Nets' approach to identification and handling of operational risks is described in its Security Policy. The objective is for Nets' customers to feel secure when using Nets' systems and services. The Security Policy provides the overall framework for all IT security and applies to all permanent and temporary staff at Nets as well as to the use of systems and data belonging to Nets and data not belonging to Nets but which Nets can be made responsible for. The Security Policy also applies to business partners who have access to these systems and data.

The Board of Directors of Nets holds the overall responsibility for security at Nets, while the day-to-day responsibility is held by the CEO. Group Management at Nets is responsible for ensuring that IT security is consistent with the Security Policy. Nets evaluates the IT security policy on an annual basis, including changes in Nets' business and IT risk profile as well as relevant legislative amendments. The IT security policy has been approved by the Board of Directors of Nets, most recently in September 2012.

The IT security policy of the Nets Group, which is the framework for security efforts at Nets, incorporates international standards (ISO 27001/27002). The objective of the policy is to ensure three core elements: Confidentiality, integrity and availability. Protection against internal and external threats, accidental errors and mistakes and intentional tortuous actions and abuse is ensured by observing these security requirements.

The security requirements are incorporated in the design of the Sumclearing. *Confidentiality* is ensured via role-based access control in the security system RACF<sup>1</sup> and via encrypted data exchange connections to the sector network, PI-Net Batch. *Integrity* of data is obtained via RACF, which prevents the modification of data after receipt. *Integrity* of data during transport is obtained via a Message Authentication Code (MAC), an encryption technique for verifying the authenticity of data. *Availability* is managed via Service Level Agreements which are described below. In addition, the sector agreement on Clearing Approval requires unrejectability, i.e. that a party in a communication process cannot deny having sent or received a given piece of information. This is achieved through encryption of the transport channel and by using a MAC for deliveries. A MAC ensures integrity and

---

<sup>1</sup> Resource Access Control Facility is an IBM security product offering access control and auditing functionality in Mainframe.

authenticity but not full unrejectability as any user who can verify a MAC is also able to generate a MAC. Therefore, both the sending and the receiving data processing centres are able to generate a MAC. Nets may consider an alternative method if they want to meet their own unrejectability criteria.

### **Risk assessment**

In accordance with Nets' Security Policy, all executives at Nets must regularly assess the risk of not being able to deliver the services agreed with the customers. This means that operational risk analyses must be made in connection with all major changes and at least once a year. A security report is prepared on the basis of the risk assessment.

### **Outsourcing**

The operational management of the Sumclearing as well as the supporting hardware and basic software have been outsourced to IBM. The outsourcing contract has been prepared in accordance with the "Executive Order on outsourcing significant areas of activity" published by the Danish Financial Supervisory Authority on 14 January 2010, specifically in respect of IT security and contingency plans.

### **Audit**

Given the importance of the system, the Sumclearing is audited annually. The system audit reviews the operating system logs for the year with a view to detecting errors and inadequacies as well as maintaining/establishing optimum debugging procedures. In addition, the log of changes and updates of documentation such as manuals, business procedures, etc. is reviewed. The system owner of the Sumclearing (at Nets) is responsible for responding to the recommendations of the system auditors and for updating systems and documentation. Both the report, including recommendations, and the response/conclusion are submitted for approval by the Executive Management.

In its capacity as joint data processing centre, Nets is subject to the "Executive Order on system audits in joint data processing centres" from October 2008. This entails annual external audits of general IT controls, user systems and IT systems used for data exchange. General controls refer to basic IT security – not the security of specific IT systems. The auditor's statement does not specifically focus on the Sumclearing but on Nets' overall operations.

### **Operational reliability**

The Sumclearing is an operationally reliable system. Since the introduction of Clearing Approval in 1998, settlement has been completed correctly within the same clearing day with two exceptions.

Service Level Agreements (SLAs) have been drawn up with participants, service providers and IBM for the operational management of the Sumclearing. The SLA with IBM defines service windows for planned downtime as well as requirements for unplanned downtime. Procedures have been established for continuous follow-up on the compliance with SLAs, including weekly and monthly reporting from the Service Level Management.

### **Business procedures and support**

Business procedures and instructions have been established for the daily administration of the Sumclearing. Nets uses an ITIL V3 IT infrastructure with well-documented procedures for handling operational incidents, ensuring registration, reporting, analysis and follow-up on incidents. Similarly, there are well-documented procedures for change management, ensuring that e.g. change requests are analysed, prioritised and approved prior to the implementation of the change. Moreover, Nets and IBM have separate production-like environments for the development and testing of system changes.

Nets has a service desk during opening hours, while support personnel are available outside opening hours. Nets is therefore able to handle all incidents around the clock. Staffing requirements are measured against the expected quality of operations to be performed. Nets' employees are ITIL certified and trained to handle incidents across all areas of the business.

### **Incidents**

Minor incidents, e.g. postponements in the Sumclearing, occur occasionally while major incidents are rare, the latest one taking place on 13 October 2009, when a power failure at IBM caused delays in the Sumclearing. Several follow-up measures have been implemented since then. The operational stability of the Sumclearing is also reflected in Nets' operational statistics which show Sumclearing availability of or close to 100 per cent.

### **Capacity**

Nets has outsourced the monitoring of the Sumclearing operations to IBM, which also handles the monitoring of the most vital areas of Service Management at Nets. Nets and IBM hold meetings to make capacity



assessments of the Sumclearing. In addition, stress tests are performed regularly by IBM.

#### **Business continuity/contingency procedures**

Nets has a dual strategy for business continuation consisting of a business contingency plan (Business Continuity Plan) drawn up and maintained by Nets and a technical contingency plan (Disaster Recovery Plan) prepared and maintained by IBM. The aim of the contingency plans is to ensure that, in the event of a serious incident, Nets is able to restore key business processes in a prioritised order and within an approved time frame. The requirements for restoring key business processes are established in accordance with the requirements made by owners, financial authorities, banking organisations, card companies and legislation as well as on the basis of an assessment of the significance of the business processes to customers and partners. The contingency plan also comprises crisis management, an escalation plan and communication of information.

IBM undertakes a quarterly revision of the technical contingency plan to ensure that it is always up-to-date and in keeping with actual conditions. Nets also has a contingency system ensuring an automatic, regular reminder and follow-up on the need for updating the business contingency plan. The objective of the contingency plan has been approved by the Board of Directors of Nets, most recently in September 2012.

#### **Testing of contingency procedures**

Nets' contingency plan is tested every year internally as well as in collaboration with IBM. Every year, an overall test plan is drawn up as well as a plan for each individual test. Tests are made using various techniques such as fail-over of IT production systems to another operating centre, hyperswaps (switching between active modes (DASD)), testing of communication procedures, use of phone lists, exercises with suppliers and customers and desktop exercises in relation to contingency processes. A test report is prepared after each test. The test plan and test report are submitted to Nets' management and an overview of completed contingency procedure tests is submitted to the Board of Directors annually. Any changes resulting from errors or inadequacies detected in connection with the tests are implemented in accordance with Nets' change management procedures.

### Contingency arrangements

Nets has entered into an agreement with IBM on the provision of two-centre operations in connection with the operations of the Sumclearing. The overhead line between the two data processing centres is more than 7 km and they have separate power supplies, cooling systems, networks, telephony, etc. The primary and secondary data processing centres are linked through redundant optical fibre connections enabling real-time data mirroring. The Recovery Point Objective<sup>1</sup> is therefore close to zero. Nets has agreed a Recovery Time Objective<sup>2</sup> of four hours with IBM. IBM tests centre switching annually in connection with the contingency tests.

As mentioned in section 1.2 above, new international principles were introduced for payment and settlement systems in April 2012. The principles contain several new operational recommendations in the operating area which may result in new focus areas for the Sumclearing. For instance, the maximum recovery time for a system's contingency arrangements must not exceed two hours and, ideally, the contingency arrangements should be capable of taking over operations immediately.<sup>3</sup> This emphasises the importance of the system owner regularly assessing whether a recovery time of four hours is still sufficient.

---

<sup>1</sup> Recovery Point Objective is an indicator of the volume of data that might be lost in the production environment due restoration of the environment.

<sup>2</sup> Recovery Time Objective is the acceptable amount of time to restore a service to normal operations after operational disruption.

<sup>3</sup> Cf. BIS (2011) principle 17.

## 3.8 CORE PRINCIPLE VIII – EFFICIENCY

---

*The system should provide a means of making payments which is practical for its users and efficient for the economy.*

### 3.8.1 Assessment

Broadly observed.

The Sumclearing is largely unchanged since its introduction in 1998. In consequence, it is necessary to ensure that the Sumclearing provides a means of making payments which is practical for its users and efficient for the economy also in the future.

The current settlement times in the Sumclearing are not up-to-date compared with the expectations of the end users for a modern payment system and do not sufficiently support the development of new payment solutions. The long settlement times entail that today the system cannot be characterised as being efficient for the economy and the end users.

The ongoing modernisation of the Danish retail payments infrastructure will ensure faster settlement and that the Danish infrastructure fully matches those of comparable countries.

### 3.8.2 Justification

#### **Practical for its users and efficient for the economy**

The Sumclearing is part of the Danish banks' joint payments infrastructure, in which all banks in Denmark participate. An advantage of having a joint payments infrastructure is that fixed operating costs can be distributed on all participants. This also provides for uniform processing of retail payments, irrespective of the payer's and payee's choice of bank. However, it is important that the systems are developed in step with changes in society and accommodate the requirements of the participants and the needs of individuals and firms whose payments are settled in the system.

The Sumclearing has only been subject to few changes and adjustments since its introduction in 1998. It is assessed that today the system does not meet all the requirements for a modern settlement system. Under the current settlement structure, it takes at least one day to effect a payment transfer, and at weekends and public holidays firms and consumers will not receive a payment until up to four days after the payment has been initiated. The current settlement times are not up-to-

date compared with the expectations of the end users for a modern payment system and do not sufficiently support the development of new payment solutions. The fact that immediate settlement is not an option in the Sumclearing entails that the system cannot overall be characterised as being efficient for the economy and the end users.

### **Settlement times and liquidity requirements**

Settlement is arranged in such a way as to reduce the participants' use of liquidity as much as possible. This is the main reason for the night-time settlement, allowing the participants not to use liquidity in the daytime for major interbank payments, settlement of retail payments and the like. The timing of the settlement also ensures the liquidity interaction with the VP settlement system as mortgage payments to the mortgage banks via the Sumclearing are effected prior to the mortgage banks' disbursements of interest and repayments. Finally, the Sumclearing is a net settlement system, providing the participants with liquidity savings.

### **Capacity**

In 2011, 1.7 billion payments were cleared and settled via the Sumclearing at a total value of kr. 5,718 billion.

Even a doubling of the number of participants will not pose a problem to the handling of settlements in the Sumclearing, according to the system owner. As the number of direct and indirect participants is declining these years, the capacity of the Sumclearing is not expected to be challenged.

### **Price policy**

The price structure of and the price of participation in the Sumclearing are publicly available at the Danish Bankers Association's website. Prices are fixed in such a way as to cover the costs of Nets and the Danish Bankers Association. This means that system costs are fully covered by the participants. Participants pay an annual fee to participate in the Sumclearing.

In addition to the fee, new participants in the Sumclearing also pay a fee when they obtain access to the payment infrastructure. This fee is fixed in such a way that new participants contribute to paying the costs incurred for developing the Sumclearing.

Participants are not directly involved in the fixing of prices but may object to pricing due to the ownership structure of the sector. The system owner reviews the price level regularly.

**Future infrastructure for retail payments**

A comprehensive modernisation process of the infrastructure for retail payments in Denmark was initiated at the beginning of 2012, resulting in faster settlement of Dankort payments made at weekends in 2012. At the end of 2012, firms will have improved opportunities for executing transfers exceeding kr. 1 million on banking days via Danmarks Nationalbank's payment system, Kronos. At the end of 2013, a new system, the Intradagclearing, will be introduced for executing intraday bank transfers. The last element of the modernisation process is the introduction of a system for immediate transfer of amounts up to kr. 500,000 24 hours, seven days a week all year round.

The modernisation process will significantly reduce the settlement times for retail payments and several inefficient features will be eliminated. Among other measures, liquidity forecasts for the night-time settlement will be introduced and following the modernisation, the Danish infrastructure will fully match those of comparable countries.

### **3.9 CORE PRINCIPLE IX – ACCESS CRITERIA**

---

*The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.*

#### **3.9.1 Assessment**

Observed.

The access criteria for the Sumclearing are publicly available and allow many participants access without significant limitations. Direct and indirect participation is possible.

It is recommended that clear access and exit procedures be established for the Sumclearing. A similar recommendation was made in the IMF report (2007).

#### **3.9.2 Justification**

The access criteria for participation in the Sumclearing are publicly available and described in a memorandum on the Sumclearing available at the Danish Bankers Association's website. The memorandum was last updated on 10 February 2011 and is available both in Danish and English. The access criteria are shown in Box 2 below.

Originally, the access criteria were established in collaboration with the participants in the system. The access criteria place no restrictions on the participants such as size or capital. The price structure also ensures fair and open access for all potential participants irrespective of size. Direct participants pay an annual fee of kr. 25,000 each to participate in the Sumclearing. Indirect participants do not pay a fee.

#### **Access to the Sumclearing**

A potential participant must send a written request to the Danish Bankers Association to become a participant in the Sumclearing. No written, publicly available material about the access procedures for new participants exists; this is considered to be a disadvantage for potential participants. It is recommended that e.g. a manual for new participants be prepared, describing the access procedures.

No sector tests are performed in connection with the access of new participants. However, the individual data processing centre performs internal tests with a view to ensuring that new participants are set up correctly in the systems. The access procedures take 3-4 months and existing participants are notified of new participants by e-mail.

The criterion for becoming an indirect participant is that the participant is licensed to conduct banking activities and enters into relevant agreements with the Danish Bankers Association and a direct participant.

**Exit from the Sumclearing**

Exit from the Sumclearing is agreed between the Danish Bankers Association and the participant in question in accordance with the terms of notice applying to exit from Danmarks Nationalbank's, the data processing centres' and Nets' systems. However, a direct participant who loses its banking licence or breaches the agreement with the Danish Bankers Association, or an indirect participant who breaches the agreement with the direct participant, will be excluded from the Sumclearing with immediate effect.

No written material describing the Sumclearing's exit procedures exists. It is therefore recommended that procedures be defined, described in e.g. the contractual basis and published with a view to ensuring that the participants are aware of the exit procedures. A similar recommendation about clear exit procedures from the Sumclearing was made in the the IMF report (2007).

A potential direct participant must:

- 1) authorise Danmarks Nationalbank in writing to settle net positions from electronic clearing and truncation, clearing at Nets or both from its Sumclearing account at Danmarks Nationalbank,
- 2) belong to one of the following categories:
  - a Danish bank, savings bank or cooperative bank subject to supervision by the Danish Financial Supervisory Authority,
  - a Danish branch of a foreign bank, savings bank or cooperative bank that is subject to supervision in another EU member state or a country with which the EU has concluded a cooperation agreement on supervision in the home country,
  - a Danish branch of a foreign bank, savings bank or cooperative bank subject to supervision by the Danish Financial Supervisory Authority,
  - a foreign bank, savings bank or cooperative bank that is subject to supervision in another EU member state or a country with which the EU has concluded a cooperation agreement on supervision in the home country and that conducts cross-border activities in Denmark,
- 3) meet the technical and administrative requirements laid down by the Danish Bankers Association at any time\*,
- 4) hold a current account and a Sumclearing account at Danmarks Nationalbank and be connected to Kronos.

In addition, participation in the Sumclearing settlement is conditional on the participant complying with Danmarks Nationalbank's requirements at any time, including the conditions for opening an account at Danmarks Nationalbank.

\* The Danish Bankers Association's technical and administrative requirements include the terms and conditions stated in *Håndbog for Betalingsformidling*.



## 3.10 CORE PRINCIPLE X – GOVERNANCE

---

*The system's governance arrangements should be effective, accountable and transparent.*

### 3.10.1 Assessment

Observed.

The management structure of the system ensures efficient handling of problems concerning maintenance and development of the infrastructure. The Danish Bankers Association's permanent committees and working groups are in regular contact with the participants and Nets in order to quickly resolve problems relating to the Sumclearing.

Clear lines of responsibility exist between the operator and the system owner, ensuring that the responsibility for handling relevant problems is easily assigned.

The compliance with the 10 core principles described in this assessment report illustrate that core principle X is observed. The Sumclearing complies with nine out of 10 core principles.

### 3.10.2 Justification

It is the task of the Danish Bankers Association to coordinate the participants' views on the maintenance and development of the Sumclearing and to maintain the contractual basis on which the Sumclearing is based. The coordination of the participants' views is handled by the Danish Bankers Association's committees and working groups.

As system operator of the Sumclearing, Nets handles the day-to-day operation and implementation of changes in the system. The allocation of tasks and responsibilities between the Danish Bankers Association and Nets is described in, e.g., the Danish Bankers Association's memorandum on the Sumclearing and in the administration agreement concluded by the parties.

The management structure is composed of the Danish Bankers Association's committee and working group structure. These are permanent committees and working groups, ensuring that the maintenance and development of the infrastructure is discussed regularly and that relevant information is prepared and maintained.

Participants are notified of decisions concerning the Sumclearing by letters to management, *Finansrådet Orienterer* or by e-mail.

### **Consultation**

The Danish Bankers Association consults with the participants concerning Sumclearing issues as a number of major members, the Association of Local Banks, Savings Banks and Cooperative Banks in Denmark, the Danish Regional Bankers' Association and Nets are permanent members of the Danish Bankers Association's committees and working groups. In addition to the planned meetings of the permanent committees and working groups, meetings are held on an ad hoc basis, supported by informal telephone calls and e-mails.

Problems concerning the maintenance and development of the Sumclearing are resolved in collaboration with the participants and Nets. Examples of such tasks include the maintenance of *Håndbog for Betalingsformidling* and the term of notice for indirect participants.

### **Decisions**

The maintenance and development of the infrastructure is based on collaboration incorporating the participants' various wishes for and views on the Sumclearing. In the case of disagreement among the participants, the Board of Directors of the Danish Bankers Association makes the final decision. Unless otherwise agreed, the Board makes decisions by simple majority. However, it is very rare that participants disagree on issues concerning the Sumclearing. Therefore, it is not common practice for infrastructure issues to be decided by voting in the Board of the Danish Bankers Association.

The Danish Bankers Association's committees and working groups act as advisers to the Board. Committees and working groups may make decisions of an operating nature while overall decisions imposing financial or legal obligations on the participants must be made by the Board of the Danish Bankers Association.

### **Budgets**

No procedures for budget follow-up have been established. For the development of the Sumclearing, the Danish Bankers Association will, in each specific case, conclude an agreement with Nets in which follow-up procedures are established.

The operating costs for the Sumclearing have been unchanged for many years. Fees are collected by Nets.

### **Objectives and strategy of the Sumclearing**

The system owner's objectives and strategy for the Sumclearing are that the system should set out the framework for stable, secure and efficient settlement of payments, which is in keeping with the wishes and needs

of the users and participants. The objective and strategy are established in collaboration with the participants and have been unchanged over time.

The objectives are supported by the Danish Bankers Association's committees and working groups, which regularly focus on the development and maintenance of the Sumclearing.

---

## 4. Literature

---

Andersen, Niels C. (2004), Clearing and settlement in a legal perspective, Danmarks Nationalbank, *Working papers*, 20/2004.

Working group on domestic payment transfers (2012), Report on domestic payment transfers in Denmark, January 2012.

Bech, Morten Linneman, Bo Madsen and Lone Natorp (2002), Systemic Risk in the Danish Interbank Netting System, Danmarks Nationalbank, *Working papers*, 8/2002.

BIS (2001), Core Principles for Systemically Important Payment Systems

BIS (2005), Statistics on Payment and Settlement Systems in selected Countries – Figures for 2003.

BIS (2012), Principles for Financial Market Infrastructures, April 2012

BIS (2012), Principles for Financial Market Infrastructures – Disclosure Framework and Assessment Methodology, December 2012

Danmarks Nationalbank (2002a), *Financial stability*.

Danmarks Nationalbank (2002b), Second assessment of the Sumclearing in relation to the Core Principles for Systemically Important Payment Systems, [www.nationalbanken.dk](http://www.nationalbanken.dk).

Danmarks Nationalbank (2005), *Payment Systems in Denmark*.

Danmarks Nationalbank (2010), *Documentation basis for monetary-policy instruments and settlement of payments in DKK, EUR, SEK and ISK*.

Danish Bankers Association, *Håndbog for Betalingsformidling* (in Danish only).

Danish Bankers Association, *Aftalebog*, Vol. 1 (in Danish only).

Danish Bankers Association, Memorandum on the Sumclearing at the Danish Bankers Association's website.

Danish Bankers Association (2001), The banks' open infrastructure, *Finansanalyse*, No. 13, September 2001.

Danish Bankers Association (2005), Self-assessment of the Sumclearing in relation to the Core Principles for Systemically Important Payment Systems

IMF (2006), Financial Sector Assessment Program, Denmark, Detailed assessment of the Core Principles for Systemically Important Payment Systems, International Monetary Fund, Monetary and Financial Systems Department

Danish Competition Authority (2000), Conditions for access to the Danish Bankers Association's payment systems agreements.

Mølgaard Pedersen, Anders, Tommy Meng Gladov and Jesper Bakkegaard, Settlement Times for Payments in Denmark, Danmarks Nationalbank, *Monetary Review 2011*, 2nd quarter, Part 1.

Restelli-Nielsen, Peter M. and Ulla Sterkel (1998), The Settlement Finality Directive, Danmarks Nationalbank, *Monetary Review*, 4th quarter.