

Costs in the payment system

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This article presents the estimated costs in 2007 of the use and production of the most common Norwegian payment services: payment cards, giros and cash. The social cost of using and producing payment services was NOK 11 billion. This is equivalent to 0.49 per cent of GDP, which is low in comparison with other countries. The social cost per payment is lower with the use of payment cards than with the use of cash. To our knowledge, the Norwegian Cost Study 2007 is more comprehensive than any other cost survey on payments conducted so far.

1. Introduction and aim

The purpose of this analysis is to assess:

- the cost structure for different payments
- developments in costs over time
- the relationship between prices/income and costs for payment services

Norges Bank conducted similar surveys in 1988, 1994 and 2001.² The 2007 survey is a continuation of these previous surveys but is of wider scope in terms of both the number of services and which participants in the payment chain are included.

Section 1 of the Norges Bank Act states that the bank is to “(...) promote an efficient payment system domestically as well as vis-à-vis other countries.” An efficient payment system ensures that payments are performed quickly, cost-effectively and securely. Our cost analyses were performed in order to obtain information on cost-effectiveness.

The article is structured as follows: section 2 presents the scope of the analysis; section 3 describes the methods used for the calculations; section 4 outlines the assumptions underlying the calculations; section 5 presents the calculations of social cost; sections 6, 7 and 8 present the private cost to banks, households and merchants respectively; and section 9 provides a summary.

2. Scope and data

The analysis maps the cost of the production and use of payment services for banks and their subcontractors, Norges Bank, households and merchants³ in 2007. The data are taken primarily from three independent surveys

covering banks, households and merchants respectively.

The most important services and participants in the payment system are shown in Chart 1.

Chart 1 The payment chain

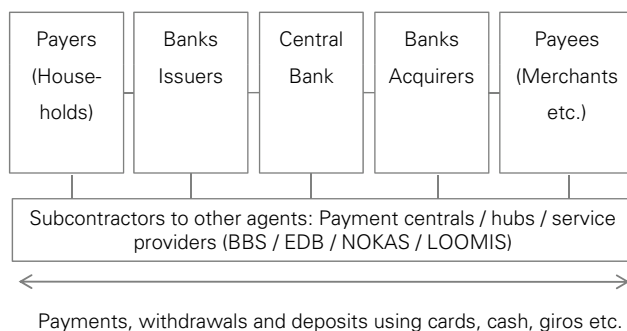


Chart 1 shows the six participants involved in a standard payment transaction using cash, card or giro. These are the payer (household/cardholder), the payee (merchant or other enterprise), the payer's bank, the payee's bank, the central bank, and subcontractors (in this context the clearing houses are subcontractors to all of the other participants). When payments are made by card or giro, the transaction between payer and payee goes through all of these participants. When payments are made in cash, the transaction itself is conducted directly between the payer and payee without any intermediary. However, cash will be transferred between several of the participants when withdrawals and deposits are made. All participants will

¹ We would like to thank Leif Veggum, Asbjørn Enge, Knut Sandal, Tommy Sveen and Kåre Hagelund for useful comments.

² These surveys are presented in Fidjestøl, Flatraaker and Vogt (1989a and 1989b), Robinson and Flatraaker (1995a and 1995b) and Gresvik and Øwre (2002 and 2003) respectively.

³ Merchants are defined as shops, transport firms, service providers and others that accept payment for goods and services at point of sale (both physical and online).

therefore be involved in payments either as payer/payee or as intermediary for cash/deposit money. Payments using deposit money can be initiated from both ends of the chain, depending on whether the transaction is, say, a credit transfer (ordinary giro payment) or direct debit.

The analysis covers the most popular domestic payment services: payment cards, cash and giros. Costs have been calculated for a total of 26 services.⁴

Bank-to-bank payments, cross-border payments and payments using cheques and e-money are not included.^{5,6} Nor does the survey cover all costs for all payees, such as the cost of issuing bills. Norwegians' use of payment services abroad is not included.

The survey of bank costs was responded to by 12 banks with a combined market share of approximately 55 per cent in terms of assets. The survey mapped all activity at these banks relating to their costs for payment and cash services. This information was obtained through electronic questionnaires formulated and distributed by Norges Bank.⁷

The household survey mapped households' payment

habits during a one-week period in September 2007. Together with statistics for the use of various payment instruments from Norges Bank, this provided a basis for calculating the *number of payments* using payment cards and cash in Norway in 2007 (see Box 1). Households' *costs* were calculated on the basis of information from the survey combined with other statistics for wages, estimates for time consumption, etc. The survey was conducted by telephone, and respondents were a representative sample of Norwegians over 15 years of age.⁸

The survey of merchants' costs was conducted by Norges Bank in late 2007 and early 2008.⁹ Respondents were a selection of enterprises, with an overrepresentation of grocery stores, convenience stores, hotels and restaurants. Unfortunately the response rate was below 5 per cent, and so not all of the information from this survey was of sufficient quality to be used in the analysis.

Besides these surveys, the calculations employed statistics from Norges Bank's *Annual Report on Payment Systems*, information on cash deposits with Norges Bank and cash handling company Norsk Kontantservice

Box 1: Number of cash transactions and costs

To calculate social costs in the payment system, it is necessary to know the number of transactions. Good statistics are available for card and giro transactions and for the number of cash withdrawals. There are no statistics for cash payments. In this analysis, we have calculated the number of cash payments on the basis of information from the household survey (see Tables 6 and 10).

Our calculations show that cash payments accounted for 24 per cent of the total number of transactions and 14 per cent of the value of sales at point of sale in Norway in 2007. This corresponds to 285 million transactions with a value of NOK 62.1 billion.

Some information on deposits and withdrawals suggests that calculating the number of cash payments on the basis of the household survey may produce too low an estimate. For example, cash withdrawals by Norwegians in 2007 totalled NOK 141.5 billion, and total deposits at Norges Bank and cash-in-transit companies came to NOK 208 billion (see Gresvik and Haare 2008). The household survey was designed specifically to provide information for this calculation as well as a number of other questions in the cost analysis. We have therefore chosen to use this calculation. The number of cash payments is also less important for the cost calculations than might be expected. (*cont.*)

⁴ 35 services were originally mapped, but the data are not good enough for the calculations for all of these services to be published. A selection of these services is presented in Table 8.

⁵ A detailed description of the analytical methods and results for the three surveys can be found in Gresvik and Haare (2009a and 2009b).

⁶ E-money is defined as a monetary value in the form of a claim on the issuer which is stored on an electronic medium, issued on receipt of funds, and recognised as a means of payment by enterprises other than the issuer. (Deposit money controlled by payment cards is not e-money.)

⁷ The Norwegian Savings Banks Association and the Norwegian Financial Services Association provided valuable input on the design of the bank questionnaire. The questionnaires are reproduced in Gresvik and Haare (2009b).

⁸ The questions were formulated by Norges Bank. The company NORSTAT AS conducted the actual interviews.

⁹ The survey was designed and implemented with assistance from the Federation of Norwegian Commercial and Service Enterprises and the Norwegian Hospitality Association.

It is possible to calculate the number of cash payments in other ways. For example, Gresvik and Haare (2008) show that, based on official statistics for household consumption, the value of cash payments at point of sale was NOK 227.7 billion or 38 per cent of consumption. Assuming that the average amount of each cash payment is the same as in the household survey (NOK 217.9), the number of cash transactions will be 1 045.1 million or 53 per cent of the total number of payments at point of sale.

Based on the number of cash payments from the household survey, the total social cost for cash payments and withdrawals/deposits was approximately NOK 3.5 billion. Costs rise with the number of cash payments, but perhaps not as much as might be expected. Even trebling the number of cash payments (see paragraph above) will increase the cost by only 39 per cent (NOK 4.87 billion). This is covered in more detail in section 3 of Gresvik and Haare (2009a). As the number of cash withdrawals and deposits is known (it is recorded fairly precisely in other statistics), the cost of these services will be the same whatever the number of cash payments.¹ It is only the cost of the actual payments that increases. Given the way that our analysis has been designed, this means that it is the *distribution* of cash that has the greatest impact on costs, not the number of cash payments.

As a result, uncertainty about the number of cash payments is of moderate significance for our analysis. For other purposes, a more thorough analysis of the number of cash payments would be necessary.

¹ Our analysis treats the number of cash deposits/withdrawals as independent of the number of cash payments. This is a simplification of reality. We can assume that, in reality, an increased number of cash payments will result in an increased number of deposits/withdrawals. Our analysis therefore shows that an increase in payments does not give an increase in costs, because the number of deposits/withdrawals remains the same.

(NOKAS), information from banks' financial statements, and data from Statistics Norway on demographics, wages and inflation.

3. Method

We have calculated the *private cost*¹⁰ for each participant. To obtain this, we calculated the unit cost¹¹ for each service used/produced by each participant. The unit cost for each service multiplied by the number of transactions (payments/deposits/withdrawals) for that service in Norway gives the total cost per service for each participant. The sum of these total costs per service per participant is the private cost for each participant.

The *social cost* has been calculated as the difference between the private cost for each participant in the payment chain and transfers (fees) between the participants.¹² This method is described in Bergman et al. (2007).

The *banks* that took part in the survey supplied cost data. These costs were distributed between the different payment services on the basis of an activity-based costing (ABC) analysis (see Bjørnenak 1993 or Cooper and

Kaplan 1999). An ABC analysis was also used in the survey conducted by Norges Bank in 2001. This method assumes that it is the activities at a bank that give rise to its costs. These activities might, for example, be account maintenance or cash storage. These costs are distributed between the different services using allocation keys (cost drivers). The cost drivers used in the calculations include the number of transactions and transaction value.

ABC analysis is particularly well-suited to cost distribution where support functions generate a large share of total costs and where there is considerable variation in products, services, customers and production processes. Both of these apply to banks' production of payment services. The method is described in greater detail in Gresvik and Øwre (2002 and 2003) and Gresvik and Haare (2009a,b).

The *household* survey took the form of telephone interviews. The survey of households' payment habits was inspired by Norges Bank's 1993 survey of payment habits and surveys in the Netherlands (Brits and Winder 2005) and Belgium (National Bank of Belgium 2005). The households that took part were asked about their

¹¹ Unit costs were calculated on the basis of costs and the number of transactions per service at the banks that took part in the survey.

¹⁰ Private cost is defined as each participant's total costs, either generated as part of their own activities or incurred in the form of fees or subcontractor services.

¹² A calculation of this kind must also take account of social externalities. There are considerable positive network externalities in payment systems, but as this analysis focuses on costs, these positive network externalities are not discussed.

payment habits and about their payments on the previous day. Observations from the survey were extrapolated to one year and compared with Norges Bank's own statistics for non-cash payments. This information was used to calculate the number of cash payments at point of sale (Box 1). To estimate households' costs, we used observations from the merchant survey on time consumption per transaction (see Table 11), assumptions about time consumption for cash withdrawals/deposits, and income statistics from Statistics Norway. Time costs were calculated as wages paid less tax.¹³

Costs for *merchants* were calculated on the basis of information from the merchant survey. The questionnaire focused on costs and procedures for payments using cards and cash. Costs were caused either by own activity (accepting payments, cashing up, storing cash, etc.) or by bought-in services (terminal rental, cash transport, etc.). A separate time study of the acceptance of payments was carried out to give the best possible estimate of how much time each type of payment took. Information from the survey was used to calculate unit costs for card and cash payments. Together with the estimates from the household survey for the usage of cards and cash, this gave the private cost to merchants.

For banks, households and merchants, a distinction was drawn between costs generated by their own activity (own production costs) and *subcontractors'* costs. Banks' subcontractors in this context are clearing houses, cash handling companies and Norges Bank. For households and merchants, banks count as subcontractors. Thus costs could be distributed between five participants in the payment chain: banks, subcontractors, Norges Bank, households and merchants. The distinction between own and subcontractors' costs is fundamental to the calculation of social cost.

4. Key assumptions

The calculations were based on the following assumptions:

i) Our estimate of the number of payments in Norway based on information from the household survey and Norges Bank's payment statistics (see Box 1).

ii) Observed time consumption for payments in the merchant survey, and our own estimates of time consumption for other transactions.

iii) Wage costs from Statistics Norway's statistics for merchants' employees and households.

iv) The banks in the survey are representative of the Norwegian banking industry.

v) Banks' income as reported to ORBOF¹⁴ can be distributed between the different services in the manner chosen. A more detailed description can be found in Gresvik and Haare (2009 a).

vi) To calculate seigniorage costs/income¹⁵ for cash payments, the proportion of the stock of cash in circulation actually in use for payment purposes was estimated. Of the total stock of cash in circulation of NOK 51.5 billion in 2007¹⁶, NOK 21 billion or 41 per cent was used for registered payment purposes. The remainder was used for unregistered activities, such as hoarding, person-to-person payments and criminal activities. See Gresvik and Haare (2008 a) for further information.

Other assumptions underlying the various calculations are mentioned in the footnotes.

5. Social costs

We have calculated the social cost of payments in Norway at NOK 11.16 billion or 0.49 per cent of GDP in 2007. Costs associated with cash and card payments alone (payments at point of sale) are estimated at 0.38 per cent of GDP.¹⁷

The social cost of payments using cash, cards and giros is presented in Table 1.

¹³ This can be considered the lowest value of leisure time, given that the individual is free to allocate his time between work and leisure (see Ministry of Finance 2005).

¹⁴ Database of financial information from banks and finance companies at Statistics Norway (see <http://www.ssb.no/skjema/finmark/rapport/orbof/>).

¹⁵ Seigniorage is counted as a cost in the form of lost interest income for those holding cash. In theory, this cash could instead be deposited in a bank and generate risk-free interest income. As the issuer of notes and coins, Norges Bank has corresponding interest income, as the value of the cash issued can be used to generate risk-free income for the central bank. This calculation is presented in more detail in Gresvik and Haare (2009a). The value of seigniorage is not shown in this article, as Norges Bank's income is cancelled out by the other participants' costs. The calculation of private costs in section 6 includes seigniorage.

¹⁶ Quarterly average.

¹⁷ Total social costs amounted to 0.65 per cent and payments at point of sale for 0.52 per cent of mainland GDP in 2007. Mainland GDP consists of all domestic production activity except for the production of crude oil and natural gas, service activities incidental to oil and gas, transport via pipelines, and ocean transport.

Table 1 Social cost by service

Service	Billions of NOK	Per cent
Cash payments	3.49	31.3%
Card payments	5.36	48.0%
Giro payments	2.31	20.7%
Total	11.16	100.0%

Table 2 breaks down these costs between the participants that bear them.

The payment chain shown in Chart 1 can be modified slightly to illustrate the costs in the payment chain (see Chart 2). The costs in Table 2 have been inserted into Chart 2 together with figures for fees etc. The green-shaded areas are those covered by the survey. The broad white arrows show the participants' own production costs. The sum of these production costs is the social cost. The thin black arrows show payments to other participants for services rendered (fees etc.). The sum of the amounts for the white and black arrows is the total private cost.

The social cost is broken down by service in Table 1 and by participant in Table 2. Tables 3, 4 and 5 show the cost of the different services to the various participants. This is the private cost (fees paid and own production costs) which, once fees etc. have been deducted, gives the social cost for cash, card and giro payments respectively.

The total private cost is NOK 18.84 billion. The private cost consists of the costs incurred by each participant in using or producing a payment service. The participants

Table 2 Social cost by participant

Participant	Billions of NOK	Per cent
Banks	4.95	44.4%
Norges Bank	0.13	1.2%
Households	2.18	19.5%
Merchants and other enterprises	1.53	13.7%
Subcontractors	2.37	21.2%
Total	11.16	100.0%

Table 3 Cash (payments, deposits and withdrawals). In millions of NOK

	Private cost	Fees paid	Own production cost
Banks	2 194.6	479.6	1 715.0
Norges Bank	154.9	27.3	127.6
Households	1 440.7	592.7	848.1
Merchants and other enterprises	322.1	5.2	316.9
Subcontractors	485.7	0.0	485.7
Total	4 598.1	1 104.8	3 493.3
Social cost			3 493.3

Table 4 Card payments. In millions of NOK

	Private cost	Fees paid	Own production cost
Banks	3 385.7	1 613.3	1 772.4
Norges Bank	0.0	0.0	0.0
Households	2 002.3	1 185.3	817.0
Merchants and other enterprises	2 117.1	899.3	1 217.8
Subcontractors	1 548.8	0.0	1 548.8
Total	9 053.9	3 697.9	5 355.9
Social cost			5 355.9

Chart 2 Costs in the payment chain. In 1000 mill. NOK

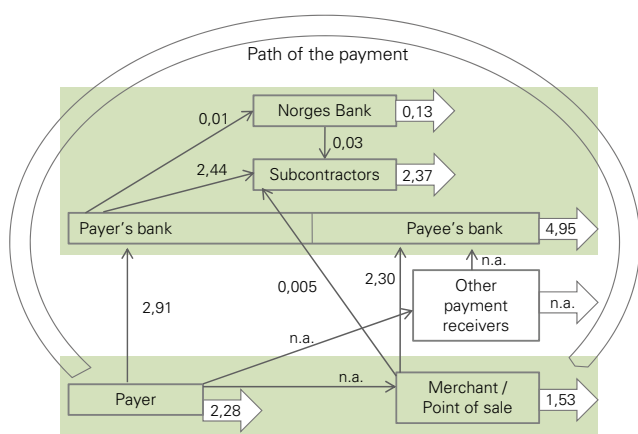


Table 5 Giro payments. In millions of NOK

	Private cost	Fees paid	Own production cost
Banks	1 806.7	348.7	1 458.0
Norges Bank	0	0	0
Households	1 645.0	1 129.3	515.8
Merchants and other enterprises	1 401.8	1 401.8	0*
Subcontractors	334.8	0	334.8
Total	5 188.4	2 879.9	2 308.5
Social cost			2 308.5

* The analysis did not include merchants' costs for giro payments. Nor are there any statistics shedding light on these costs, and so they have been set at zero. Thus the analysis underestimates giro costs.

Table 6 Social cost of selected services

	Social cost In millions of NOK	Number of trans. Millions	Unit social cost NOK
Cash	3 493.3	494.7	7.06
ATM withdrawals	1 296.8	98.5	13.17
Deposits and withdrawals at counter	1 682.1	33.5	50.21
Payments	514.3	285.0	1.80
Cashback with purchases*	0.0	77.7	0.00
Card	5 355.9	902.4	5.93
BankAxept	3 326.8	805.3	4.13
International cards	2 029.1	97.1	20.90
Giro (= a+b or c+d+e)	2 308.5	510.7	4.52
Electronic giro (a)	1 481.6	462.3	3.20
Paper-based giro (b)	826.9	48.4	17.08
Direct debit (c)	130.1	49.6	2.62
Credit transfers (d)	2 113.9	453.5	4.66
Other transfers (e)	64.5	33.8	1.91
Internet banking (part of a)	1 032.4	318.8	3.24
Total	11 157.8	1 830.1	6.10
Total point of sale (cash and card)	8 849.2	1 319.4	6.71

* Cashback in connection with purchases of goods is not registered as taking extra time and is therefore not allocated any social cost.

paid NOK 7.68 billion for the services supplied to one another. Of this, the banks charged NOK 5.21 billion in fees to supply payment services to payers and payees (see section 6).

Note that there are two different types of transaction in the payment system: *payments* and *withdrawals/deposits*. Payments are transactions where a means of payment (deposit money or cash) is used to settle the transaction. This may be immediate, for example when paying for a good or service in a shop, but may also be at an earlier or later time, for example when paying a bill for a good or service. Deposits and withdrawals are transactions where means of payment are converted from cash to deposit money or from deposit money to cash. These transactions are different in nature to payments and therefore have a different cost structure. Cash payments are possible only when the payer has cash to hand. The social cost of paying by cash is therefore the sum of the cost of paying, making deposits and withdrawing cash.

Table 6 shows the social cost and number of transactions for a selection of payment and deposit/withdrawal services.

It can be seen from Table 6 that the transaction cost for cash payments (NOK 1.80) is relatively low in comparison with card payments (NOK 5.93). Once deposit and withdrawal costs are included, however, cash becomes more expensive per transaction (NOK 12.26).¹⁸ The transaction cost for giro payments is low (NOK 4.52).

The difference in unit cost between cash and cards is due primarily to the large number of card payments leading to a low unit cost despite the social cost for the payment infrastructure being substantially higher for cards than for cash. Time consumption for cash and debit card payments at point of sale is roughly the same. Giro payments take longer to make than card payments, but have a cheaper infrastructure (no need for separate terminals/tills at point of sale).

Both electronic card and giro payments can exploit economies of scale, which are difficult to exploit in the distribution of cash (deposits / withdrawals). Cash handling is mainly a manual operation, and even with automation in the form of ATMs etc there is limited potential for exploiting economies of scale.

¹⁸ Calculated as NOK 3 493.3 / 285.0 = NOK 12.26.

Table 7 Banks' cost recovery in 2007

	Costs in billions of NOK	Income in billions of NOK	Cost recovery
All services	7.39	5.21	71%
Card and giro services	5.19	4.62	88%
Card services	3.39	2.08	61%
Giro services	1.81	2.53	140%
Cash services	2.19	0.59	27%

6. Private costs and income for banks

Banks are the main suppliers of payment services. The analysis shows that banks and their subcontractors carry approximately two-thirds of the social cost.

The private cost for banks' production of payment services was NOK 7.4 billion in 2007.¹⁹ This breaks down into NOK 2.2 billion for cash management, NOK 3.4 billion for card services, and NOK 1.8 billion for giro services.

Banks' income from payment services was NOK 5.2 billion. This is a cost recovery of 71 per cent (see Table 7).²⁰ The information on income is based on statistics from ORBOF and shows the total income generated by banks in the form of fees per payment transaction and fixed periodic fees from payers and payees.²¹ Banks' costs are more than covered when it comes to giro services, but cost recovery on cash services is low.

The unit private cost to banks for the most important payment services fell from 2001 to 2007. These unit costs are shown in Table 8.

There are a number of differences in the services included in the calculations in the 2007 survey and previous surveys. Card payments are covered in more detail, and cash management has also been included in the 2007 survey.

Unit costs for the most used services (Internet banking and card payments) have fallen since the previous survey in 2001. On the other hand, the cost of most manual services has increased substantially, due primarily to reduced use.

Banks' costs for payment services have fallen since 1988, while the number of transactions has increased sharply

Table 8 Banks' unit private costs (ln 2007-NOK)^a

Selected services	2007	2001
Telephone giros	2.50	6.50
Internet banking (retail and corporate)	2.00	9.00
Direct debits	2.50	5.50
Company terminal giros as money orders	4.50	5.00
Postal giros	7.00	8.00
Giros at counter – account debits		16.50
Giros at counter – cash payments	30.50	15.00
Internet banking and corporate terminal giros with advice	29.50	27.50
Cheques	–	25.50
Card payments, issuer		
BankAxept	1.00	2.50
International debit card	3.50	
International credit card	2.50	
Card payments, acquirer		
BankAxept	1.50	
International debit card	3.50	
International credit card	32.50	
Own ATMs, own customers	7.00	9.50
Own ATMs, others' customers	6.00	
Own ATMs, international cards	11.50	
Other banks' ATMs, own customers	8.50	8.00
Deposits/withdrawals	43.50 ^b	17.00
Transfers	0.50 ^c	31.50
Night safes	43.50	62.00

^a Both 2007 and 2001 figures are rounded to the nearest NOK 0.50.

^b Weighted average. There were more deposit and withdrawal services in 2007, both automated and manual. The manual services had the highest costs.

^c "Transfers" denotes transactions between accounts at the same bank (customer accounts or bank's own accounts). The main reasons for the major reduction in cost are that this service is now electronic (previously manual) and that the number of transactions has increased sharply.

¹⁹ Of banks' total costs in 2007 (NOK 205 billion), around NOK 36 billion were operating costs. Of these, NOK 7.4 billion were related to payment services.

²⁰ Cost recovery is based on income directly related to payment services. It can be argued that banks also derive other income that is partly related to payment services, such as parts of their interest margin (as it is common to pay a low deposit rate on current accounts), and that parts of their other income (advisory etc.) should be attributed to payment services, as it is common to offer these services to customers who already have a current account and use the bank's payment services. We have not performed calculations of this kind here.

²¹ ORBOF shows total income; the allocation of this income has been performed by the authors (see Gresvik and Haare 2009a).

Table 9 Productivity indicator for banks. (Amounts in 2007-NOK)

	1988	1994	2001	2007 ^e	2007 ^f
Private cost (billions of NOK)	6.0	7.0	6.6	5.4	7.4
Private cost as a proportion of GDP (%)	0.59%	0.61%	0.38%	0.24%	0.33%
Unit private cost (NOK) ^g	15.80	12.00	5.90	4.00	4.50
Number of transactions at banks (millions)	381 ^b	481	968 ^c	1512	1545
Number of branches	2 200 ^a	1 600	1 429	1 260 ^d	1 260
Number of full-time employees (thousands)	33 ^a	23	23	20 ^d	20

^{a)} Rounded.

^{b)} Withdrawals at counter are not included.

^{c)} All transactions (estimates for services not included in national statistics) are included.

^{d)} Source: FNH.

^{e)} Same set-up as in 2001 survey.

^{f)} Costs for cash and all costs for cards are included – standard 2007 set-up.

^{g)} Unit private cost is the total cost of all services divided by the total number of transactions.

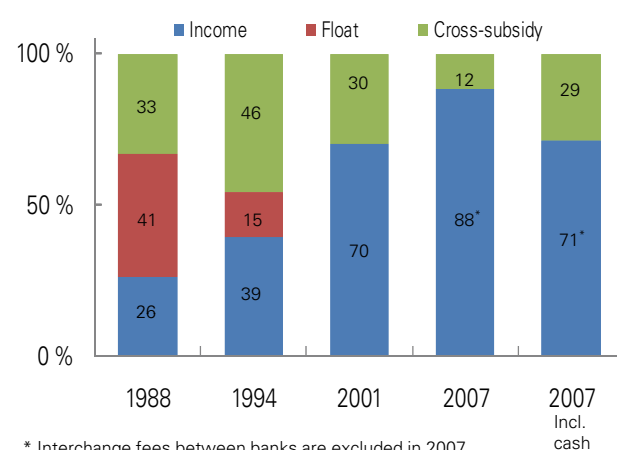
(see Table 9). A comparison with the previous surveys indicates that banks' productivity has improved. Table 9 shows data for 2007 both in total (2007f) and for a selection of services comparable with the 2001 survey (2007e).

Banks' cost recovery has increased since 1988. The composition of their income has changed from a considerable proportion of float income²² to the bulk now being generated by prices and fixed fees that are more directly related to the use of payment services (see Chart 3). Many banks cut the price of a number of services in 2008, which may, in isolation, have now resulted in lower cost recovery.

7. Private costs for households

In the household survey, households were asked about their payment *habits* (not costs).

Table 10 shows the number of payment transactions at point of sale. In the survey, the value of cash payments (discussed in more detail in Box 1) has been estimated at NOK 62.1 billion in 2007, or 14 per cent of the value of payments at point of sale. The number of cash transactions was 285 million, or 24 per cent of the total number of transactions. The total number of transactions at point of sale in 2007 was 1 209 million.

Chart 3 Banks' cost recovery on payment services. Per cent

* Interchange fees between banks are excluded in 2007

Table 10 Payments at point of sale in 2007. Number and value

	Transactions		Value	
	Millions	Per cent	Billions of NOK	Per cent
Payments at point of sale:	1 209.0	100.0	432.1	100.0
Cash payments	285.0	23.6	62.1	14.4
Card payments	924.0	76.4	370.0	85.6
BankAsept	805.3	66.6	298.1	69.0
Petrol company cards	21.6	1.8	10.8	2.5
VISA, MasterCard, American Express and Diners Club	97.1	8.0	61.0	14.1

²² Float income is the imputed interest income on funds in transit between payer and payee.

Table 11 Time consumption per transaction (seconds)

Estimates			Observed in merchant survey		
ATM withdr.	Withdr. / deposits at counter	Giro payments	Cash payments	BankAxept (PIN)	International payment cards (signature)
110	180	60	16	17	57

When households' share of social costs is calculated, it is assumed that time consumption for payments at point of sale is the same for customers and merchants (see Table 11).²³ Time consumption for ATM withdrawals has also been calculated, based on estimates of time consumption in a Swedish cost survey (Bergman et al. 2008), while the estimates of time consumption for making giro payments and withdrawals and deposits in branches are discretionary estimates.

Time consumption per transaction has then been multiplied by average wages to obtain households' "own production cost". Households' private costs are calculated as the sum of own production costs and fees paid to banks.

Households' private costs (excluding seigniorage) amounted to NOK 5.09 billion in 2007. This breaks down into NOK 1.44 billion for cash payments, NOK 2.00 billion for card payments and NOK 1.65 billion for giro payments. Fees paid to banks accounted for NOK 2.91 billion (57 per cent of costs)²⁴, and the time taken to make payments for the remaining NOK 2.18 billion.

8. Private costs for merchants

The survey of merchants' costs focused on the cost of accepting card and cash payments from customers. Merchants' private costs for payments came to NOK 3.84 billion in 2007. Of this, cash payments accounted for NOK 0.32 billion and card payments for NOK 2.12 billion. In addition, costs of NOK 1.40 billion have been included for own giro payments.²⁵ Of the total of NOK 3.84 billion, NOK 2.30 billion consisted of fees to banks for the use of payment services (such as terminal rentals), fees for withdrawing and depositing cash, merchant fees for cards, and so on.

The cost to merchants was calculated as the sum of fees paid to banks, costs for own activities, costs paid to subcontractors, and seigniorage. Costs from own activities include costs at the tills, the use of counting machines or the transfer or storage of cash, and the cost of having

payment terminals. Cash and card services can also be purchased from subcontractors (banks and others).

International payment cards have a different price model to the BankAxept system, which mainly charges merchants for the rental of the terminal and, in some cases, a flat fee per transaction of a few øre (1 NOK = 100 øre). The price structure for international cards means that merchants are charged a percentage of the sales value (see Table 12). Although the use of international cards is low in Norway, this price structure means that it costs merchants a relatively large amount to accept these cards (NOK 0.9 billion of a total of NOK 2.1 billion for accepting card payments, even though only one in ten card transactions are with international payment cards).

Table 12 Merchant fees, international cards

Card type	Average fee as a percentage of sales value
VISA	1.78%
MasterCard/Eurocard	1.86%
Diners Club	2.51%
American Express	2.89%

Time spent on payments is a significant cost component for both households and merchants (see Table 11). Time consumption, together with data from Statistics Norway on wage costs, can be used to calculate merchants' wage costs for payments.

Merchants also provided figures for sales value and the number of payments for cards and cash. Although these results were not used in the calculations, they support the data from the household survey (shown in Table 10). Merchants stated that 25 per cent of both sales value and payments were made in cash in 2007, and the rest by payment card.²⁶ This confirms that payment cards are now the most important payment instrument at point of sale.

²³ Based on the time study in the merchant survey.

²⁴ Households generate no income from payments beyond the utility from settlement in connection with the change in ownership of a good or service.

²⁵ This figure includes costs for merchants and "other enterprises", such as public bodies and various enterprises not covered by our survey. The costs included for "other enterprises" are fees paid to banks for payment services for the corporate market. Internally generated costs (time consumption, etc.) are not included in the calculation of costs for these "other enterprises".

²⁶ See also Gresvik and Haare (2008) for alternative calculation methods for cash usage.

Box 2: Results of cost surveys in other countries

Cost surveys have been performed in a number of countries since the year 2000. Those most closely related to the Norwegian survey have been conducted in Sweden, Portugal, the Netherlands and Belgium. The methodology varies from survey to survey, but the Dutch and Belgian surveys have many similarities. None of these surveys was as comprehensive as the Norwegian survey.

The Swedish survey was based on data from 2002 and covered cards and cash. Cost data was obtained from or calculated for banks, their subcontractors, the central bank, households and merchants. The Dutch and Belgian surveys were performed in 2003 and 2004 respectively (using data from the preceding year) and analysed the costs associated with cards and cash for banks, the central bank and merchants. The Portuguese survey looked at banks' costs for card, cash and giro payments. There have also been surveys of households' payment habits and an equivalent survey looking at merchants.

Comparisons between the surveys should be made with caution. For one thing, payment systems differ. For another, the scope of the surveys varies. This applies to which participants in the payment chain are included, which services are examined, and how carefully the cost components are mapped. The methodology also varies, and the surveys were performed in different years. In Norway, for example, we have used ABC methodology to calculate banks' costs. The same was done in the Portuguese survey, but the Swedish, Belgian and Dutch surveys employed different approaches.

Table B1 presents a selection of the results of these surveys. Table B2 presents selected aspects of the scope of the surveys. The results for Belgium and the Netherlands are close, while those for Sweden and Portugal differ somewhat. Whether this is due to methodology or real differences is difficult to say. To obtain a better basis for comparison, one would need to look in more detail at the methodology, data and assumptions behind the calculations. To make international comparisons, it would be useful if a standard methodology could be developed.

Table B1 Cost surveys in different countries. Results

	Belgium	Netherlands	Portugal	Sweden	Norway
	2003	2002	2005	2002	2007
Costs as a proportion of GDP	0.74%	0.65%	0.77%	0.40%	0.49%
Cash's share of merchant costs	78%	73%	18%	77%	39%
Cash's share of number of transactions	81%	85%	26%	72%	24%
Unit cost, cash (EUR)	0.53	0.30	1.85	0.50	0.88
Unit cost, debit cards (EUR)	0.55	0.49	0.23	0.34	} (all cards) 0.74
Unit cost, credit cards (EUR)	2.62	3.59	2.44	0.48	

EUR 1 = NOK 8.02 (2007) and EUR 1 = SEK 9.16 (2002). Exchange rates are based on the average daily rate.

Table B2 Cost surveys in different countries. Scope

	Belgium	Netherlands	Portugal	Sweden	Norway
	2003	2002	2005	2002	2007
<i>Instruments</i>					
Cards	Yes	Yes	Yes	Yes	Yes
Cash	Yes	Yes	Yes	Yes	Yes
Bills/giros	No	No	Yes	No	Yes
E-money	Yes	Yes	No	No	No
Cheques	No	No	Yes	No	No
<i>Participants</i>					
Banks	Yes	Yes	Yes	Yes	Yes
Households	No	No	No	Yes	Yes
Merchants	Yes	Yes	No	Yes	Yes
Clearing etc.	Yes	Yes	Yes	Yes	Yes

9. Summary

The Norwegian cost survey for 2007 is, as far as we are aware, the most comprehensive survey conducted in this field.

The use of resources for payment and cash services as a proportion of GDP is low (0.49 per cent). It is probably lower than ever before, and it is low in comparison with other countries. The reasons for these low costs are low cash usage, high usage of the domestic debit card system BankAsept, and widespread use of electronic payment services.

Banks' have increased their productivity and efficiency since 2001. More and better payment services are being produced at lower cost. Costs for the most used instruments have fallen, while costs for manual payment services have, as expected, risen.

The reason for the decrease in costs for the most important payment services is a broad shift from manual to electronic services. The economies of scale associated with producing electronic services have therefore been better realised.

Banks' cost recovery has increased since 2001. The 2007 survey shows that banks' cost recovery was low for cash services, but higher for card and giro payments. Competition between banks means that increasing cost recovery is a challenge for banks.

Cash is being used less and less as a means of payment in Norway. It is difficult to calculate cash usage, partly because cash payments are anonymous and untraceable. Calculations based on our survey suggest that only one in four transactions in Norway is cash-based. As shown in Box 1, alternative calculation methods produce higher figures for cash usage. However, the overall cost of cash payments is not affected particularly by variations in the estimate of the number of cash payments. Cash payments themselves are highly cost-effective, while the distribution of cash is expensive.

Participants in the bank survey:

Andebu Sparebank
Halden Sparebank 1
Larvikbanken Brunlanes Sparebank
Sparebanken Vest
Sparebanken Øst
Sparebank 1 Midt-Norge
Sparebank 1 Vestfold
DnB NOR Bank ASA
Skandiabanken AB
Sparebanken Pluss
Fokus Bank ASA
Handelsbanken, Norwegian branch

Elavon Merchant Services (Data from the acquirer Elavon has not been published)

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