

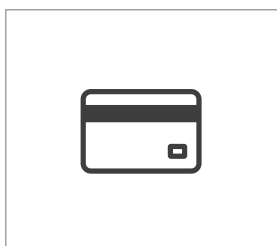
SEPTEMBER 2018
SERIES: COSTS OF PAYMENTS IN DENMARK 2016

The costs of consumer-to-business payments have decreased considerably



The social costs of payments have almost halved in seven years

The social costs of consumer-to-business payments fell from 1 per cent of GDP in 2009 to 0.5 per cent in 2016.



Dankort is the most inexpensive payment method for society

Payments with the national card scheme, Dankort, still entail the lowest social costs, at kr. 2.4 per payment – a minor reduction from 2009 to 2016.



The costs of cash and international debit cards are almost the same

In physical trade, the social costs of using international debit cards and cash in 2016 were kr. 4.1 and kr. 4.5, respectively, per payment. Both have decreased considerably since 2009.

The Danish Payments Council has surveyed the social costs of payments in Denmark

The Danish Payments Council¹ has surveyed the social costs of payments in Denmark. This analysis is part of a series of analyses and presents the social costs of domestic consumer-to-business, C2B, payments in Denmark.

Social costs express the aggregate use of resources by the three parties involved in a payment, i.e. payment intermediaries, payers and payees, cf. Box 1. Social costs do *not* comprise transfers between the parties, as they constitute an expense for one party and income for the other. An example is the merchant service charge a retailer pays to a card acquirer for acquiring a card payment. Consequently, social costs do not reflect the private payment-related expenses of the individual parties.

The Danish Payments Council's survey of the costs of payments gives payment market participants and other stakeholders insight into the social costs of various types of payment.

Denmark has a well-functioning payments market offering a variety of payment methods, depending on the payment situation. This analysis reviews cash, payment cards and the most frequently used methods for paying bills, cf. Chart 1.

The survey is based on data from 2016, as data collection and processing is a time-consuming process.

As today, the Danes primarily used payment cards and cash when shopping in physical trade in 2016. Mobile payments at retailers were very limited in 2016, but have gained ground since then. Mobile transfers between private individuals were popular already in 2016. Contactless payments were relatively new in 2016, where only 9 per cent of all card transactions in physical trade were contactless, compared with around 50 per cent in early 2018.

Social costs

Box 1

Payments are made every day all year round. The calculation of the social costs of making a payment includes elements from households, payment intermediaries and retailers and businesses. Payment intermediaries are banks and card companies, among others.

Each participant incurs costs when executing a payment. These costs are either internal *resource costs*, such as the time it takes the payer to complete a payment, or *transfers* to other participants, such as a household's payment of an annual card fee to a bank.

This analysis reviews the social costs, i.e. the aggregate use of resources by the parties involved in a payment. Transfers between the parties have been excluded.

For payment intermediaries and retailers and businesses, the resource costs relate to payroll costs for employees such as cashiers, as well as expenses for equipment, e.g. cash registers and IT systems.

For households, the resource costs of a payment to a large extent relate to the opportunity cost of the time a payment takes. This means that the cost is not money to be paid by the household, but rather a reflection of the value of the time the household spends on making payments.

The data and method of calculation of the social costs are described in more detail at the Danish Payments Council's website ([link](#)), where the other analyses in the series can be found.

Online trading has been increasing over the entire period from 2009, and since 2016 website payment solutions have been introduced that have reduced the payment time for the payer.

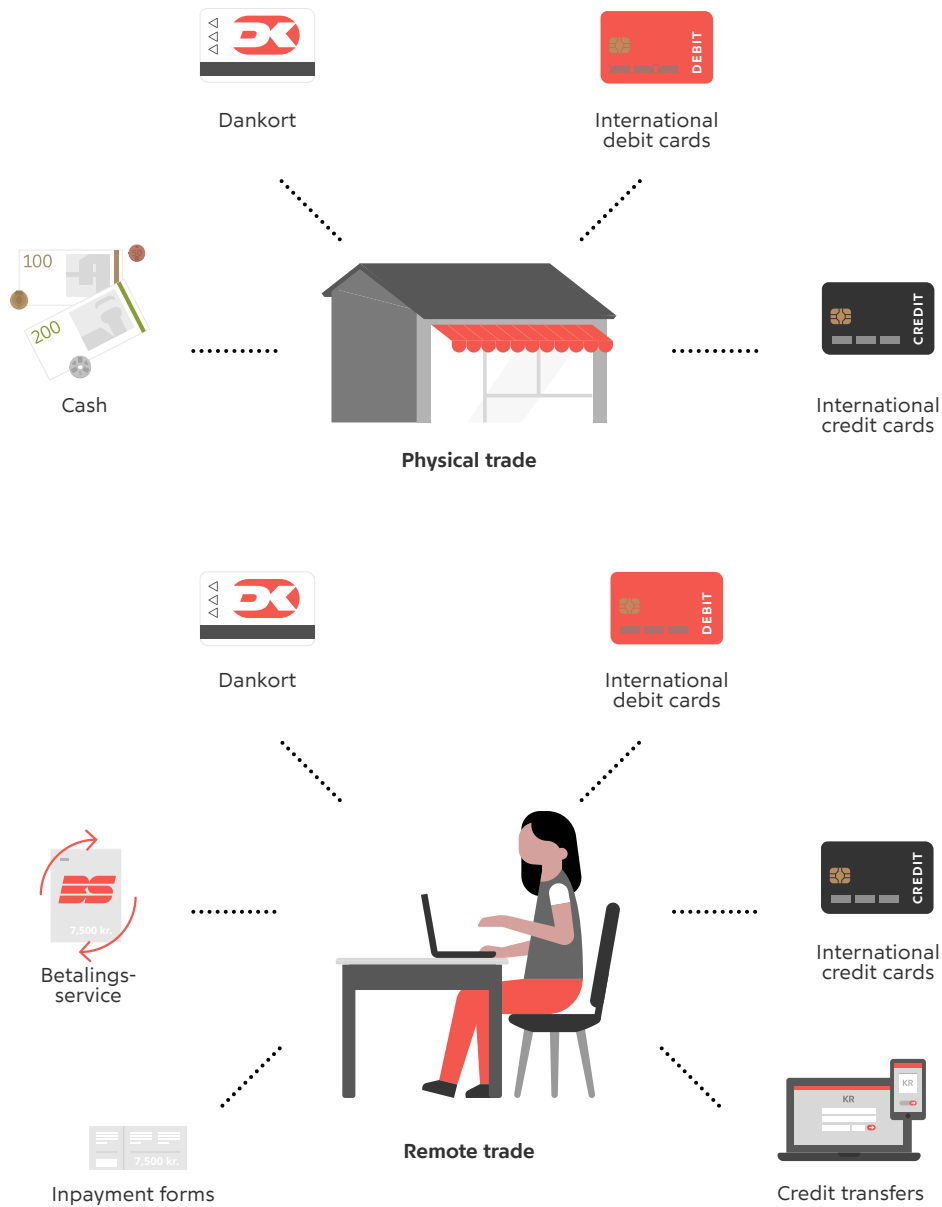
In physical trade Dankort entails the lowest social costs

Physical trade accounts for almost 80 per cent of all C2B payments in Denmark, and Danish households have access to several payment methods with low social costs. In physical trade, payments with the national card scheme, Dankort, entailed the lowest

¹ The Danish Payments Council is the framework for collaboration on the payments of consumers and businesses. The Council was set up by Danmarks Nationalbank and includes representatives of a broad range of stakeholders in the Danish payments infrastructure.

A variety of payment methods in both physical and remote trade

Chart 1



Note: The underlying transaction for inpayment forms and credit transfers is a transfer of credit, but these payment methods are discussed separately in this survey, because the payment situations are distinct for the payer. Moreover, both methods distinguish between staffed transfers and online and mobile banking transfers. It should also be noted that Dankort and Betalings-service are products for card payments and direct debit, respectively, but they are treated as payment methods in this survey.

social costs in 2016. The social cost of each Dankort payment was kr. 2.4, cf. Chart 2.

Payments are characterised by relatively large fixed costs. Therefore, the number of payments for each payment method has an impact on the average cost. In physical trade, 6 out of 10 payments were Dankort payments in 2016, equivalent to more than one billion payments. This widespread use contributes to reducing the average social cost per payment. When comparing the various payment methods, it is important to keep in mind this variation in prevalence combined with the fixed costs of payments.

The costs of cash and international debit card payments are almost the same

From society’s perspective, cash and international debit cards were also good payment methods in 2016. The social costs of cash and international debit card payments were kr. 4.5 and kr. 4.1, respectively, per payment. This puts both payment methods at the low end compared with international credit cards, which only accounted for around 1 per cent of payments in physical stores in 2016.

At kr. 13.7 per payment, the social costs of international credit card payments were higher. This is attributable to the credit option, among other factors, cf.

below. Moreover, the number of international credit card payments was lower, which affects the unit cost.

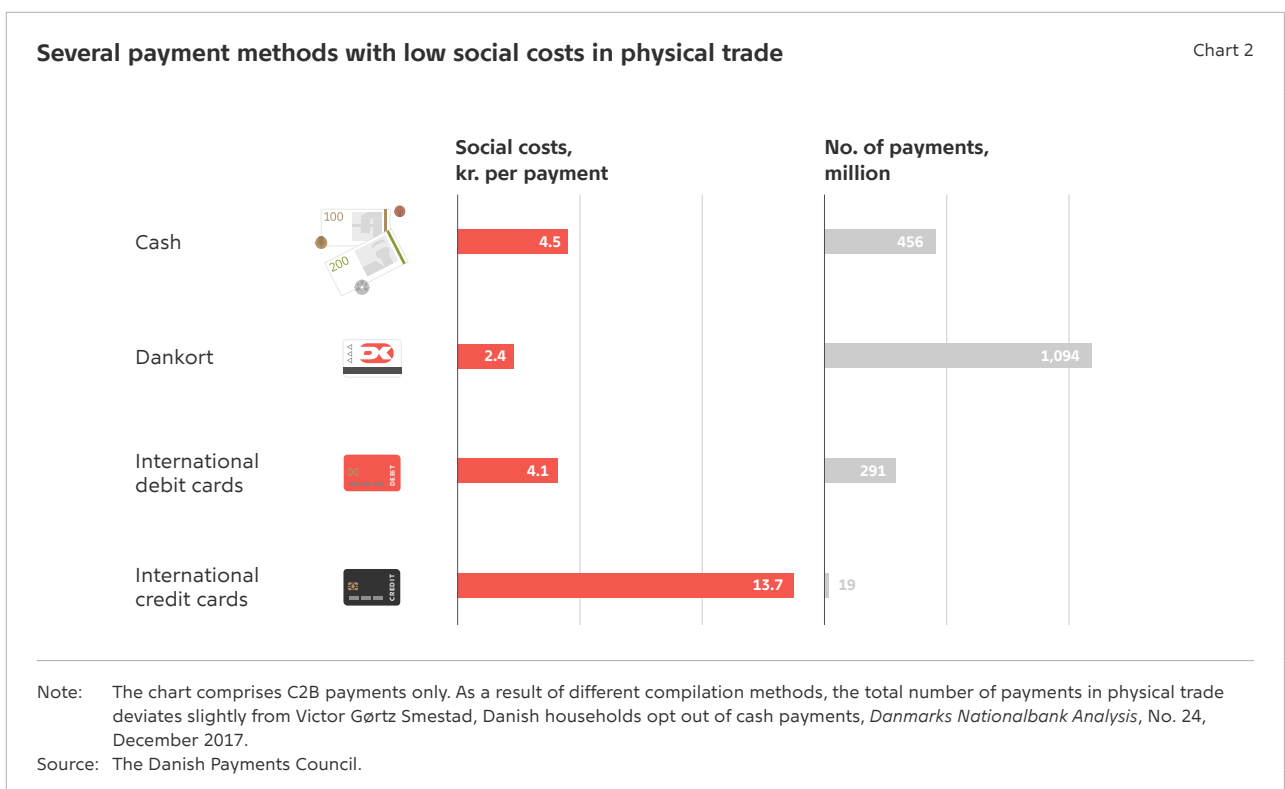
Social costs are a measure of the aggregate use of resources in a payment transaction. Importantly, however, it should be noted that a payment method may have other advantages that make it attractive to use, even though it does not have the lowest social cost. For instance, some people prefer the tangibility of cash, while others benefit from the credit option linked to an international credit card.

The payment method has an impact on the social costs for payment intermediaries

The resource costs for payment intermediaries varied considerably across payment methods in physical trade, cf. Chart 3. Payment intermediaries are banks, card companies etc., providers of online payment modules, cash-in-transit companies and Danmarks Nationalbank. The variation in costs was less pronounced for households and retailers and businesses.

Payment intermediaries incurred large resource costs for issuance of and payments using international credit cards, i.e. kr. 12 per payment in 2016.

The banks account for the largest share of the costs, as they perform credit assessments of customers



when issuing credit cards and may incur losses on the credit granted. In addition, there are licence costs to card companies such as MasterCard or Visa when international credit cards are used.² The use of international debit cards also entails licence costs, amounting to social costs of kr. 2.5 per payment for the payment intermediaries.

For payment intermediaries, the social costs related to cash were kr. 2.0 per payment in 2016 and thus lower costs than for international credit cards. The costs primarily reflect the need for physical production and handling of cash.

The resource costs for households and retailers and businesses varied less across card types as regards payments in physical trade in 2016. All card types were associated with a cost of around kr. 0.7 per payment for households and around kr. 1.0 per payment for retailers and businesses. The main reason for the modest difference is that there is little variation in the time it takes to effect a payment using the various card types.³

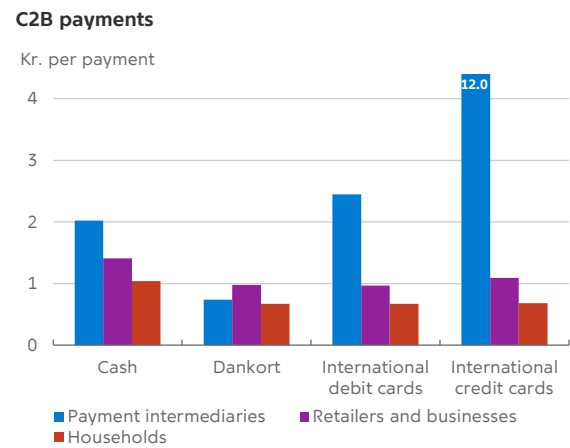
But for both households and retailers and businesses, the social costs were slightly higher for cash payments than for card payments in 2016. The resource cost for households was around kr. 1.0 per payment, while it was kr. 1.4 per payment for retailers and businesses. The reason is that cash payments take slightly longer time and that cash handling requires time and resources.

In remote trade Dankort and Betalingsservice entail the lowest social costs

Almost 20 per cent of all payments are not made in physical trade, but on a website or via online banking, and these payments account for more than 80 per cent of the total value. In remote trade⁴ Betalingsservice, Dankort and international debit cards entail the lowest social costs per payment. The social cost of Betalingsservice payments, which is a

The payment method has an impact on the social costs for payment intermediaries

Chart 3



Note: Payment intermediaries are banks, card companies, etc., providers of online payment modules, cash-in-transit companies and Danmarks Nationalbank. The chart shows the resource costs incurred by each party for a given method of payment, i.e. the social cost. The chart does not show the parties' private costs, since it excludes transfers between parties, such as fees.

Source: The Danish Payments Council.

direct debit payment method, was kr. 4.1 per payment, while it was kr. 4.5 and kr. 5.5 per payment for Dankort and international debit cards, respectively, cf. Chart 4.

The other two payment methods most often used for paying bills – credit transfers and inpayment forms – entailed relatively high social costs. The social cost was around kr. 15 per payment for both methods via online or mobile banking and around kr. 25 per transaction at a staffed counter in a bank.

Staffed payments are expensive to society because of the time used by the households and the resources used by the banks.

² Since licence costs do not constitute a resource cost for the banks, they are not a social cost. However, they are included in the calculation, as they reflect a resource cost for card companies for which data has not been collected directly in this survey.

³ The difference is attributable to a small variation in the share of contactless, and therefore faster, payments in 2016.

⁴ Remote trade includes card payments for online trade, inpayment forms, credit transfers and Betalingsservice. See Chart 1.

In general, the social costs per payment were higher in remote trade than in physical trade in 2016, mainly reflecting the longer payment time in remote trade. To effect card payments, the payer needs to enter information from the card, which takes longer time than inserting the card into the terminal, as was typically done in physical trade in 2016.

Credit transfers are cheapest relative to the turnover

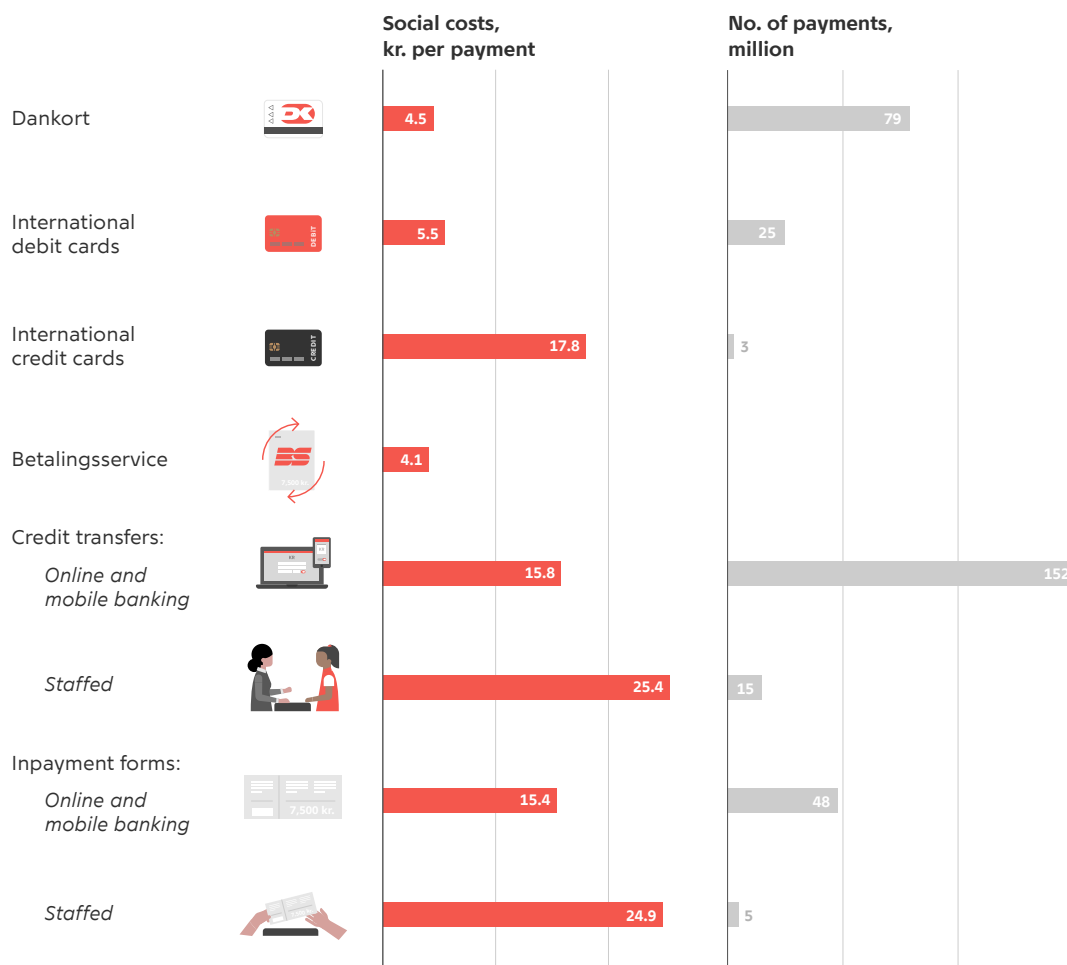
The value of payments is also relevant in relation to social costs. It indicates the amount of economic activity generated by a single payment. For a kr. 2 million payment related to a house sale, a social cost of kr. 25 is probably acceptable, but the

costs should preferably be lower for payments for groceries at the supermarket. And indeed, this is the picture emerging when social costs are related to the value of payments using the individual methods, cf. Table 1.

Payment methods with high costs per transaction are typically used for larger payments. For example, credit transfers and Betalingservice are used primarily for large payments. As a result, credit transfers accounted for the lowest cost per krone spent among all the payment methods used in 2016. Staffed transfers, in particular, were used for very large payments.

In remote trade Dankort and Betalingservice entail the lowest social costs per payment

Chart 4



Note: Since the number of Betalingservice payments is confidential, it is not shown in the chart. Automated card payments are included in the total number of C2B payments, but do not appear from the chart. This means that the sum of payments in the chart does not equal the total number of C2B payments used in other analyses in the series on the costs of payments in Denmark.

Source: The Danish Payments Council.

Large payments make credit transfers inexpensive per krone spent

Table 1

C2B payments	Social costs, øre per krone spent	Average value of payment, kr.
Physical trade		
Cash	2.2	208
Dankort	0.9	263
International debit cards	3.2	129
International credit cards	3.3	413
Remote trade		
Dankort	0.8	565
International debit cards	2.5	217
International credit cards	1.4	1,301
Betalingservice	0.3	1,502
Credit transfers:		
<i>Online and mobile banking</i>	0.2	7,840
<i>Staffed</i>	0.1	47,418
Inpayment forms:		
<i>Online and mobile banking</i>	0.6	2,590
<i>Staffed</i>	0.2	11,721

Source: The Danish Payments Council.

International credit cards are also used mainly for large payments, meaning that the social cost per krone spent is reduced to around the same level as for other payment cards in both physical and remote trade.

Generally, the value of payments is higher in remote trade than in physical trade. The reason is that we typically pay rent and other bills etc. in remote trade, and they have higher values than a typical payment e.g. at the supermarket. So when costs are viewed relative to turnover, the social costs of payments are lower in remote than in physical trade.

Although the social costs per payment are higher in remote trade than in physical trade, there may

still be arguments in favour of remote trade. The compilation of the costs of payments covers only the actual payment situation and not what other reasons there may be for using a certain payment method.

The social costs of payments have almost halved in seven years

The social costs of C2B payments totalled around kr. 11 billion in 2016, or 0.5 per cent of GDP. This implies a reduction of the social costs by almost half since 2009, when Danmarks Nationalbank also surveyed the social costs of C2B payments, cf. Chart 5⁵. So society's consumption of resources on payments in Denmark has declined notably in this period. In numbers, this corresponds to a fall by more than kr.

⁵ See Danmarks Nationalbank, Costs of payments in Denmark, April 2012.

7 billion from 2009 to 2016.⁶ It should be noted that the data for both 2009 and 2016 is partially based on data sources subject to uncertainty.⁷ However, the overall picture is assessed to be accurate.

The social costs have declined, despite an increase of 16 per cent in the number of C2B payments between 2009 and 2016, cf. Chart 6. This period also saw a shift from especially cash payments towards more card payments. Card payments thus accounted for more than two-thirds of all payments in 2016. This implies a reduction of the average social cost per C2B payment from kr. 8.6 in 2009 to kr. 3.9 in 2016.⁸

The social costs of payments have been reduced for all parties

The reduction of the social costs of C2B payments since 2009 reflects lower resource consumption for payment intermediaries, households and retailers and businesses alike, cf. Chart 7.

Retailers and businesses saw the most pronounced change. Their social costs were no less than 45 per cent lower in 2016 relative to 2009, corresponding to a reduction of kr. 3.6 billion or approximately 0.2 per cent of Denmark's GDP in 2016. The reduction of the social costs for both payment intermediaries and households in this period corresponded to around 0.1 per cent of Denmark's GDP in 2016.

The social costs per payment have not risen for any payment methods

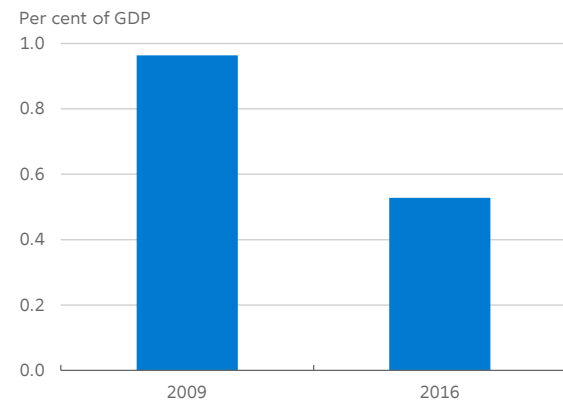
The social costs of both cash and all payment cards in physical trade have fallen, cf. Chart 8. International debit cards fell substantially from kr. 13.1 to kr. 4.1 per payment. The main reason is that international debit cards were used seven times as much in 2016 as in 2009.

The social costs of international credit cards and to a lesser extent Dankort have also declined. Possible reasons why Dankort remained relatively steady are that the number of Dankort payments was high al-

The social costs of household payments have almost halved

Chart 5

C2B payments



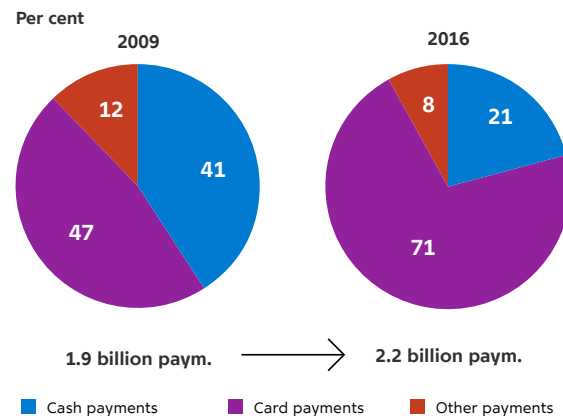
Note: As the data material of this survey is partially based on questionnaires, a part of the change in social costs may be attributable to measurement uncertainty on data in the two surveys.

Source: The Danish Payments Council and Danmarks Nationalbank.

More payments since 2009

Chart 6

C2B payments



Note: The chart includes both physical and remote trade. For the sake of comparability, credit transfers have been excluded from the number of payments in both 2009 and 2016.

Source: The Danish Payments Council and Danmarks Nationalbank.

⁶ All 2009 figures have been restated to 2016-prices.

⁷ For a more detailed description of the data, see Danish Payments Council, Background to series on the costs of payments in Denmark, *Danish Payments Council Analysis*, September 2018.

⁸ Credit transfers have been omitted from the calculation of the value of the average C2B payment.

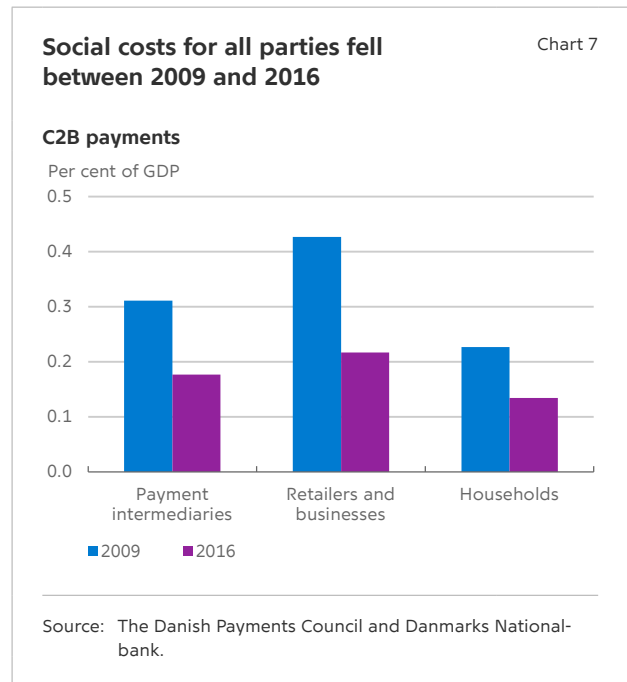
ready in 2009 and that the social costs were already relatively low for Dankort payments at that time.

The social cost per cash payment has fallen from kr. 8.1 to kr. 4.5, despite the reduced use of cash for payments in 2016 relative to 2009. This fall is attributable to the enhanced efficiency of cash handling at retailers and especially in banks. The banks have extensively outsourced their cash handling since the most recent survey.

The social costs have also fallen in remote trade. The costs of payments using international credit and debit cards fell in the period under review, and in 2016 international debit cards were close to Dankort, which was at the same low level as in 2009.

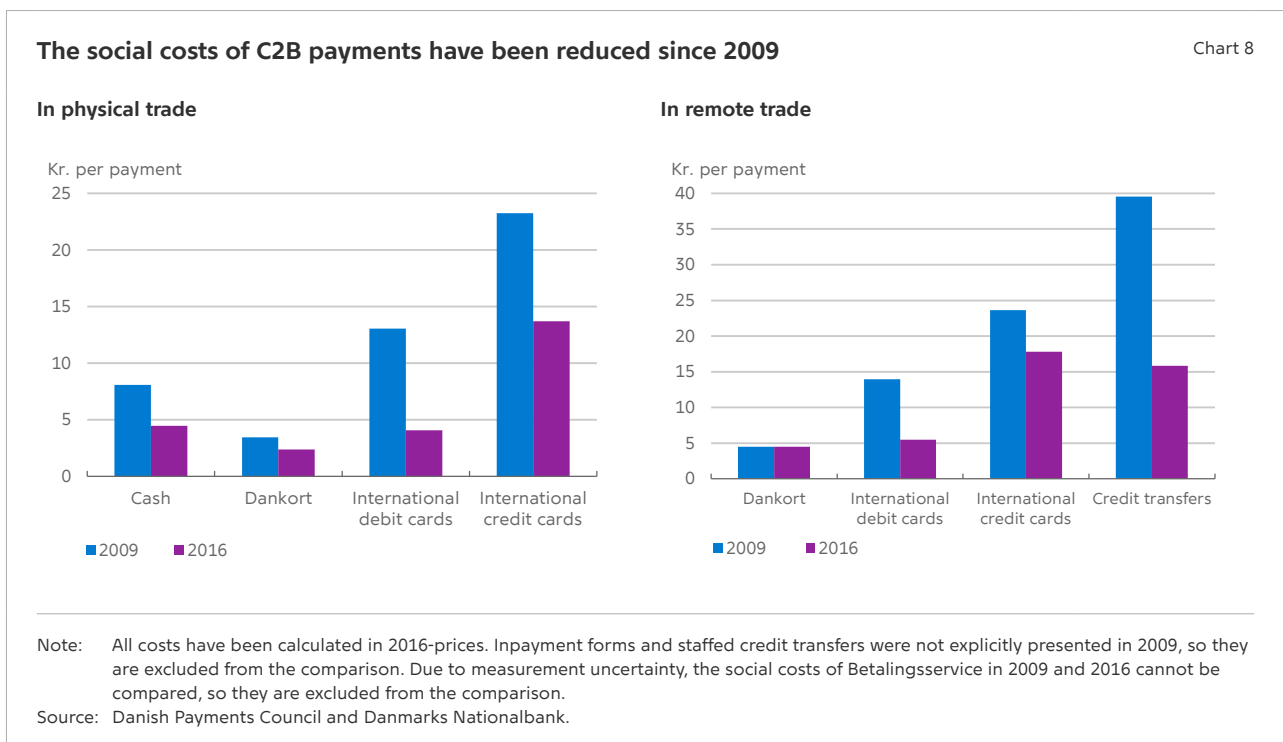
The social costs for credit transfers were also lower in 2016 than in 2009. This can be attributed to the increased number of payments and to the fact that new tools such as mobile banking payments reduce the time it takes to make a credit transfer.

The social costs of Betalingservice were also reduced during this period, which saw a shift for payees, i.e. retailers and businesses, away from paper-based and manual routines towards more automated solutions. The exact development has not been possible to calculate due to measurement un-



certainty, but given that manual processes account for a large share of social costs, the social costs for Betalingservice are assessed to have been reduced considerably since 2009.

The development in social costs per krone spent using the various payment methods from 2009 to 2016



shows almost the same pattern as that described above, cf. Chart A1 in the Appendix.

Many factors have contributed to lower social costs of payments

The Danish payments market changed extensively in the years between the two cost surveys for Denmark. Overall, these changes reduced the social costs of C2B payments.⁹

The drivers of the reduction of social costs fall into two groups: changed payment habits and measures to enhance efficiency.

Digitisation has changed payment habits, entailing a shift towards electronic payment methods. Against this background, the number of cash payments fell during the period, amounting to just 21 per cent of payments in physical trade in 2016, relative to 41 per cent in the 2009 survey of costs of payments.¹⁰ In 2016, Dankort payments accounted for the largest share of card payments in physical trade. The reduced use of cash for payments has thus contributed to the lower social costs in 2016, given the shift from cash towards Dankort and international debit cards, for which the social costs per payment are lower.

The other main driver of the lower social costs in 2016 is measures to enhance efficiency. This comprises faster payment execution and lower resource consumption in the production of payment services.

Faster payments are a result of technological advances. This has reduced the social costs of payments, since the time consumption for payments is a material resource in a social context. In 2016, both cash and card payments in physical trade had fallen to around 12 seconds on average. The shorter card payment time is due to faster terminals and contactless payments, inter alia. In the 2009 survey, the average payment time in physical trade was 14.3 seconds for cash and 14.9 seconds for card payments.

Besides faster payments, another trend has been lower resource consumption in the production of

payment services. As regards cash, cash-in-transit companies have, since 2009, taken over large shares of cash handling from banks and retailers and businesses. Cash-in-transit companies supply, collect and transport cash between retailers, bank branches and cash centres. This outsourcing is an important underlying contributor to the lower social costs of cash. Moreover, the number of bank branches has been reduced during this period, and manual procedures have been reduced considerably.

9 For a description of developments in the payments market from 2016 to 2018, see Danish Payments Council, The aggregate costs of payments in Denmark were kr. 15.6 billion in 2016, September 2018.

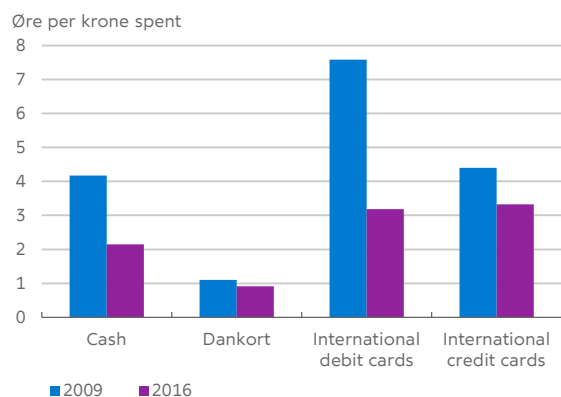
10 For a more detailed analysis of the Danes' use of cash, see Victor Gøtz Smestad, Danish households opt out of cash payments, *Danmarks Nationalbank Analysis*, No. 24, December 2017.

Appendix

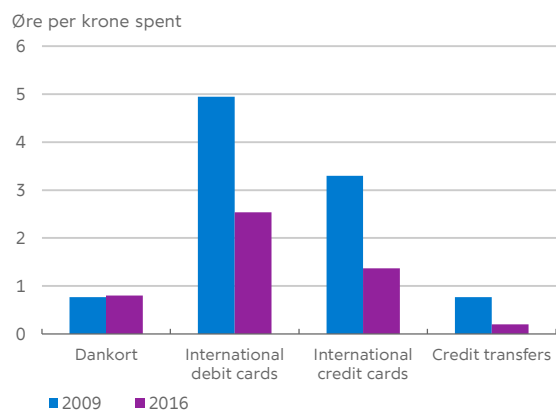
The social cost per krone spent shows the same development as the cost per payment

Chart A1

In physical trade

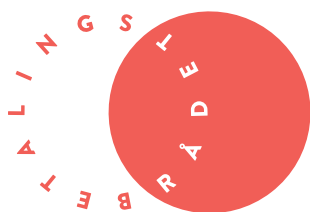


In remote trade



Note: The charts comprise C2B payments only. All costs have been calculated in 2016-prices. Inpayment forms and staffed credit transfers were not explicitly presented in 2009, so they have been excluded from the comparison. Due to measurement uncertainty, the social costs of Betalingsservice in 2009 and 2016 cannot be compared, so they have been excluded from the comparison.

Source: The Danish Payments Council and Danmarks Nationalbank.



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