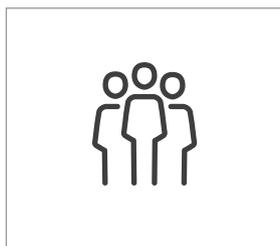


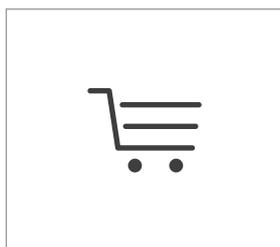
SEPTEMBER 2018  
SERIES: COSTS OF PAYMENTS IN DENMARK 2016

# The aggregate costs of payments in Denmark were kr. 15.6 billion in 2016



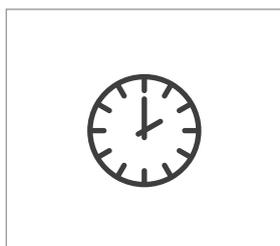
**This analysis estimates the aggregate social costs of retail payments**

The analysis looks at three types of payments: Payments between a business and a household, between two businesses and person-to-person transfers. The analysis includes domestic payments only.



**The cost of payments from households to businesses accounted for the largest share of the kr. 15.6 billion**

In 2016, the social costs of payments from households to businesses accounted for 70 per cent of the aggregate costs. These results for the payments of households can be compared with Danmarks Nationalbank's survey for 2009.



**Cost surveys are time-consuming work**

All data has been collected specifically for the cost survey. The work began in June 2016 and all key participants in the Danish payments market have provided data.

## The Danish Payments Council<sup>1</sup> has surveyed the social costs of payments in Denmark

This analysis is part of a series of analyses of social costs of payments and presents the aggregate social costs associated with domestic payments.

The aggregate costs of payments consists of the costs of payments from households to businesses, C2B payments<sup>2</sup>, payments between businesses, B2B payments<sup>3</sup>, and person-to-person transfers, P2P payments<sup>4</sup>. For each payment relationship, the analysis covers the vast majority of the payments made by households, retailers and businesses, including amortisation of loans, rent payments and daily purchases.

The social costs of payments express the aggregate use of resources by the parties involved in the payment transaction. The social costs do not include the parties' transfers to each other, such as fees, cf. below.

In the series of analyses of the costs of payments in Denmark, the Danish Payments Council presents the social costs of the most frequently used methods of payment in the payment relationships C2B, B2B and P2P. The analysis of the social costs of C2B payments is published at the same time as this analysis. The analyses of the social costs associated with P2P and B2B payments will be published as the next analyses in the series.

The analysis can be used to get insight into society's costs related to payments, including how these costs are distributed on payment situations and the parties to a payment, i.e. households, payment intermediaries and retailers and businesses.

The analysis *cannot* be used to get insight into the costs upon which households, payment intermediaries and retailers and businesses base their choices.

### The concept of social costs

Social costs are an expression of the aggregate use of resources by the parties involved in a payment transaction. Taking Chart 1 as the point of departure, the composition of the social costs is described below.<sup>5</sup>

Broadly speaking, there are three main parties in the payments market, each of which incurs costs of payment: payment intermediaries, payers and payees. The social cost of payments is the sum of the resource costs incurred by these three parties<sup>6</sup>. So the cost is an expression of the resources used by the parties involved in order to be able to execute the payment.

The social costs incurred by payment intermediaries comprise payroll costs for employees doing payment-related work, expenses for payment devices and equipment, such as ATMs, and expenses for operating and developing payment-related IT systems. Another category of costs are those related to fraud – including direct losses due to fraud and costs for anti-fraud measures.

The costs of retailers and businesses are to a large extent identical to those of payment intermediaries. They, too, must pay wages to employees and incur expenses for equipment such as cash registers. Moreover, retailers and businesses have costs related to the IT systems that enable reception of payments at retailers and in businesses, as well as costs related to fraud or robbery.

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1 The Danish Payments Council is a 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.

2 C2B payments stand for *consumer-to-business payments*, e.g. a payment in a supermarket.

3 B2B payments stand for *business-to-business payments*, e.g. purchase of materials by a business.

4 P2P payments stand for *person-to-person payments*, e.g. using cash or mobile phone at a car boot sale.

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5 For a detailed review of the cost concept, see the background paper to the Danish Payments Council's cost survey: Danish Payments Council, Background to series on the costs of payments in Denmark, *Danish Payments Council Analysis*, September 2018.

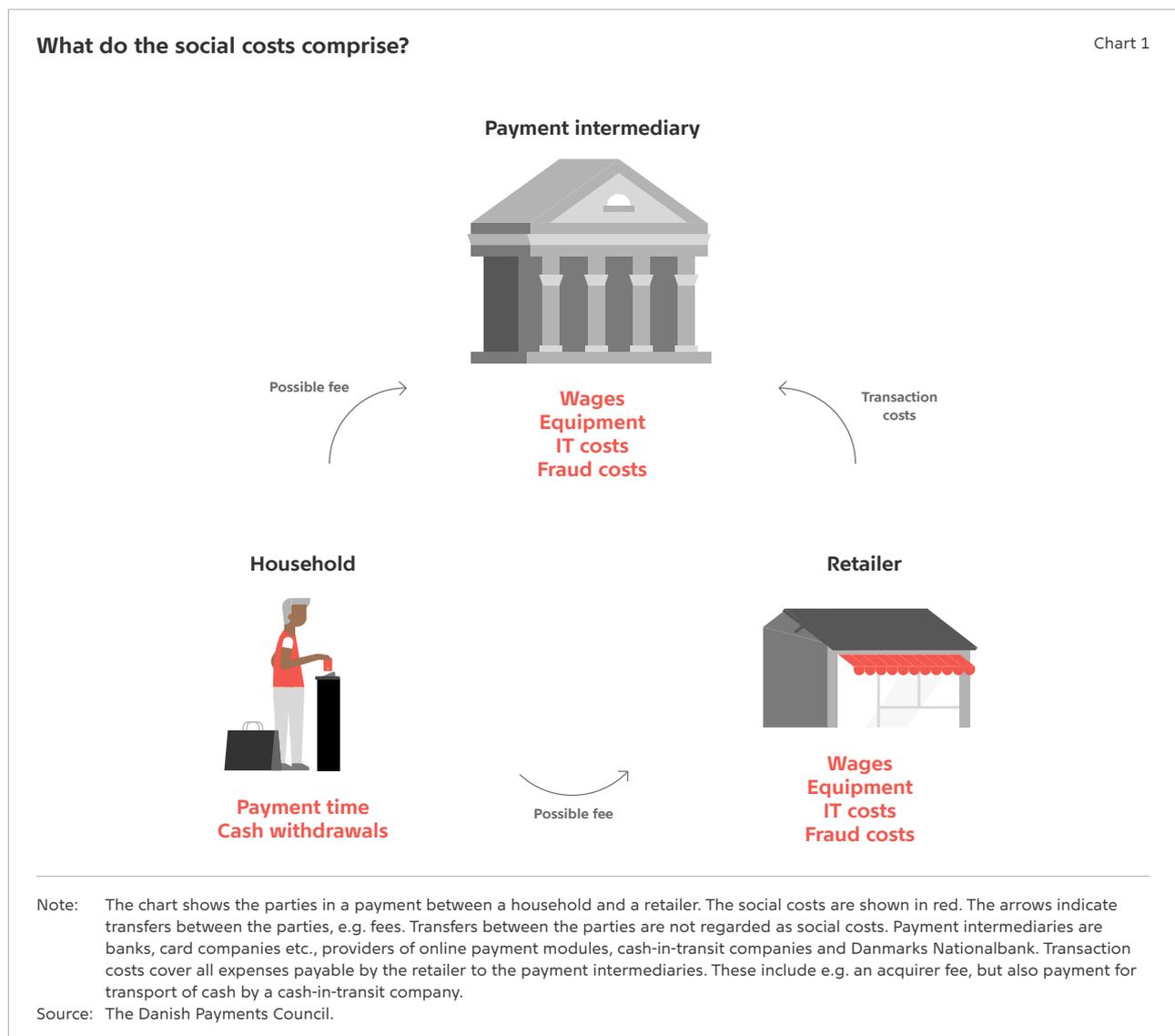
6 There are also inconveniences in relation to making payments that could be included in the social costs. They are known as negative externalities. For example, you have to be physically present to make payments in a physical store, which is not the case when you pay online. The survey disregards such inconveniences and only considers the costs associated with the payment itself.

For the households, the costs are of a slightly different nature from those incurred by retailers and businesses and by payment intermediaries. For households, the primary cost is the time it takes to make a payment. In other words, the time it takes from e.g. finding the payment card in the wallet, entering the PIN and until the receipt for the payment has been received. For cash payments, there is also time related to the act of withdrawing the cash itself. In addition, the households have a social cost related to the time spent checking bank statements. This time is a cost for society because it could be spent at e.g. working.

As Chart 1 shows, the parties also incur costs that are not included in the social costs. Costs that are

not included are transfers between the parties, e.g. the fee payable by a household for holding a payment card. Transfers, including fees, between two parties are not included in the social costs as they are income for one party but expenses for the other, so the two items cancel each other.

For a retailer viewed in isolation, an item such as transport of cash is an expense, and this expense is included in the cost concept known as private net costs. This analysis describes the social costs, and hence such transfers between the parties are not included in any of the results shown in the analysis.



### The aggregate social costs of payments in Denmark were kr. 15.6 billion in 2016

The Danish Payment Council's survey covers payments in three types of relationship. The first one is payments between a household and a retailer or business (C2B payments), the second one is payments between two businesses (B2B payments) and the third one is person-to-person transfers (P2P payments). The aggregate social costs consist of the sum of the social costs in the three types of payment relationships.

The aggregate social costs of executing payments in Denmark were kr. 15.6 billion in 2016, cf. Table 1. That is equivalent to approximately 0.8 per cent of GDP. The largest share of the aggregate social costs of executing Danish payments came from C2B payments, which accounted for 70 per cent in 2016. This fits in well with the fact that most of the transactions in the survey, approximately 80 per cent, were C2B payments, cf. Table 1.

The remaining 30 per cent of the aggregate social costs were distributed on payments between businesses and person-to-person transfers. In 2016, the social costs related to B2B payments amounted to kr. 4.2 billion, while the costs of person-to-person transfers were kr. 0.5 billion. B2B payments thereby accounted for approximately 27 per cent of the aggregate social costs. However, they accounted for only 13 per cent of the payment transactions. So the average social cost was higher for a payment

between businesses than between a household and a business. However, B2B payments often involve larger amounts than C2B payments.

As previously mentioned, the parties in the payments market are *payment intermediaries, payers and payees*. Depending on the payment situation, households and retailers and businesses can be either payers or payees. The following sections provide a more detailed account of how the social costs of payments are distributed on payment intermediaries, households and retailers and businesses.

The overall result for 2016 is that around half of the aggregate social costs for payments in Denmark were at retailers and businesses, cf. Chart 2.

The remaining part of the social costs was distributed on payment intermediaries (30 per cent) and households (19 per cent). This means that for payment intermediaries the social costs of Danish payments amounted to kr. 4.6 billion, while the households' costs were kr. 3.0 billion.

Finally, the aggregate social costs can also be broken down by whether it is costs related to payments in so-called *remote trade*<sup>7</sup> or costs related to payments in *physical trade*<sup>8</sup>, cf. Table 2. Just over half of the costs were related to remote trade. The social costs of remote trade amounted to kr. 9.1 billion in 2016, corresponding to 59 per cent of the aggregate social

**The largest share of the aggregate social costs comes from C2B payments**

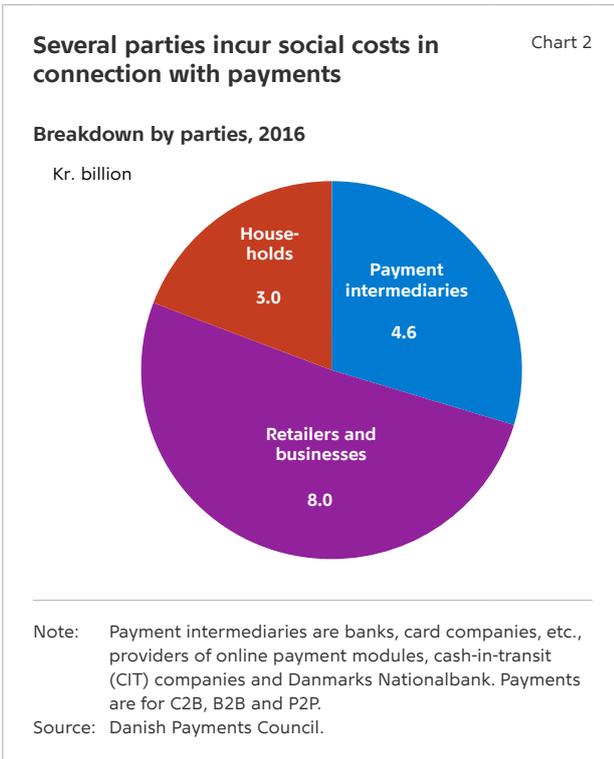
Table 1

2016	Costs		Transactions	
	Kr. billion	Share of total, per cent	Millions	Share of total, per cent
Total	15.6	100	2,912	100
Consumer-to-business (C2B)	10.9	70	2,358	81
Business-to-business (B2B)	4.2	27	372	13
Person-to-person (P2P)	0.5	3	182	6

Source: The Danish Payments Council.

<sup>7</sup> For example, paying a purchase at a homepage or a payment of a bill.

<sup>8</sup> For example, in a supermarket.



**The aggregate social costs are distributed on both physical and remote trade** Table 2

2016	Kr. billion	Share of total, per cent	Per cent of GDP
Total	15.6	100	0.8
Physical trade	6.5	41	0.3
Remote trade	9.1	59	0.4

Note: The sum of the part elements is not always equal to the overall sum due to rounding off.  
 Source: Danish Payments Council.

costs in Denmark in 2016. The social costs of physical trade were kr. 6.5 billion.

From society's perspective it is important to have a well-functioning payments market. A well-functioning payments market includes, among other things, that the Danes have access to secure and efficient payments.

**The choice of payment method affects costs**

This analysis operates with average costs for payments. Owing to fixed costs in payments, the average transaction cost for a payment method depends on the number of payments made with it. Payments are characterised by involving relatively high fixed costs. A fixed cost is virtually the same irrespective of the number of payments executed using that payment method. An example could be costs to developing new products that are not directly related to the number of payments. On the contrary, other costs vary with the number of payments executed, e.g. those costs that are related to the time it takes to make a payment. So the higher the fixed costs, the more the number of payments will have a strong impact on the average cost.

The cost to society of one extra payment using a particular payment method is known as the *marginal*

*cost*. Marginal costs are not estimated in this analysis.

**The survey is limited to the costs of the actual payment transaction**

Only the actual payment transaction itself and activities closely linked to it are covered by this survey. However, all methods of payment involve various advantages and drawbacks for the payer, payee and society in general. These pros and cons are not quantified in the analysis. For example, in physical trade it is required that the parties are physically present in the store. This is not necessary for the payer in remote trade, but on the other hand remote trade involves costs related to collection or delivery of the goods.

Cash has some qualitative properties that are difficult to measure. Cash is more tangible than electronic payment methods. But a drawback of cash is that the holder does not receive compensation if the cash is lost, destroyed or stolen.

International credit cards often come with insurance coverage and access to airport lounges. And international debit cards have built-in balance control.

Likewise, other methods of payment have various positive and negative properties which are not directly linked to the act of paying itself.

**Social costs after 2016**

Estimating the social costs of payments is a large and time-consuming task. Since no current statistics of costs and revenues linked to payments are available,

all data has been collected specifically for this survey. All key participants in the Danish payments market have contributed with data for the survey. As the secretariat of the Danish Payment Council, Danmarks Nationalbank has been responsible for preparing questionnaires and collecting and validating data in the extensive data set. This work was initiated in 2016 and continued until May 2018, when validation of the data had been completed. After that, the secretariat has been responsible for calculating the social costs and preparing the analyses in the Council's series about costs of payments in Denmark in collaboration with the survey working group<sup>9</sup>.

An important consideration for the Danish Payments Council was to conduct a survey before the new Payment Services Directive, PSD2<sup>10</sup>, entered into force. The data point 2016 makes it possible to analyse the social impact of the new legislation in the payments area next time a cost survey is performed.

The development in the payments market continued while the survey was being prepared. So the social costs of payments can be expected to have changed since 2016. Several factors are assessed to have contributed to this development.

Above all, streamlining of the payments market can be expected to have continued after 2016. For example, the social costs of cash can be expected to have been reduced as a result of Danmarks Nationalbank's outsourcing of banknote and coin production. This was effected on the basis of an assessment that it would reduce the costs of producing cash.

In addition, further innovation and digitisation can be expected to have had an impact on developments in the social costs of electronic methods of payment. This applies in relation to e.g. credit transfers, for which payment time has presumably been shortened after it has become possible to replace the NemID key card with an app.

Moreover, since 2016, the payment habits of the Danes are likely to have shifted further towards electronic methods of payment. If more people have opted for the most popular payment cards, this will have contributed to reducing social costs after 2016. The increased use of contactless card payments in physical transactions since 2016 is another factor pointing in the direction of lower social costs in 2018. The average payment time is a little shorter for contactless payments. This saves time, thereby providing a basis for assuming that the social costs have fallen for households, retailers and businesses alike. Finally, the number of transactions using international debit cards has increased since 2016. To the extent that these payments replace methods that are more expensive to society, such as international credit cards, this may have reduced social costs.

However, there are also factors that could have had the opposite impact, i.e. to increase the social costs of payments. Since 2016, a number of new statutory provisions have been introduced in the payments area. For example, the tighter anti-money laundering requirements that entered into force in Denmark in 2017 can be expected to have increased costs for banks, among others.

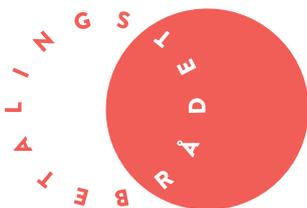
A number of other changes since 2016 can also be expected to have had an impact on the social costs of payments, but in which way is uncertain. For example, new regulation has given households freedom to choose whether they want to use the national card scheme, Dankort, or the Visa part of a Visa/Dankort. This can be expected to sharpen competition. Whether it has also led to a reduction of the social costs, which include the parties' internal resource costs only, is difficult to say.

Another major development since 2016 has been increased access to pay by mobile phone at retailers. Whether this can be expected to reduce or increase the social costs depends on the method of payment

<sup>9</sup> For further information about the data collection for the survey and its background, see Danish Payments Council, Background to series on the costs of payments in Denmark, *Danish Payments Council Analysis*, September 2018.

<sup>10</sup> Among other things, the Payment Services Directive 2, PSD2, lays down the framework for third party service providers' access to the payments market and makes it illegal to charge card payment fees to the payer. The Directive was implemented in Denmark via the Payments Act, which entered into force on 1 January 2018.

replaced by mobile payments, i.e. whether it is, say, a card payment by Dankort or by a credit card. Finally, the type of mobile payment can also play a role as the solutions available in 2018 are based on different underlying payment methods (Dankort, international debit cards and credit transfers).



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