



2023

THE COST OF RETAIL PAYMENTS



It is the role of the Central Bank of Iceland to promote a safe and effective financial system, including domestic and cross-border payment intermediation. An element in this is collecting data on various payment instruments and assessing the cost associated with their use.

The Cost of Retail Payments presents the results of the Central Bank's estimate of the private and social costs of retail payment intermediation. This information provides support for policy-making and decision-making by the Central Bank and can also be of use to other participants in payment intermediation. It makes it possible to, among other things, determine, whether it is more economical to use one payment instrument than another and whether fees accurately reflect the cost of operating payment instruments and payment services.

Issuer:

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Vol. 1, 6 June 2023 ISSN 2988-9006, web-based publication

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The cost of retail payments in a nutshell



With greater streamlining in electronic payment intermediation and an increased number of transactions, the cost of payments to society has declined since 2018, when it was last measured. The estimated social cost (internal cost) of using payment instruments in Iceland was around 47 b.kr. at the 2021 price level, or 1.43% of GDP. Each debit card transaction costs society less than each credit card transaction does. On the other hand, the cost of each cash transaction has increased, primarily because use of cash has declined in recent years. Payment services are most expensive in terms of the social cost per unit, including operation and maintenance of payment equipment.



Payment service providers (like banks, savings banks and acquirers) bear the highest cost of payment intermediation, but they also earn income from it. The commercial and savings banks lost money on cash withdrawals and payment services in payment intermediation in 2021, but both they and acquirers profited on payment card operations. Credit cards generated the greatest profits. The average profit is estimated at 122 kr. per credit card transaction, as compared with 8 kr. per debit card transaction.



The social cost (internal cost) to sales and service providers has increased by nearly 1 b.kr. since the 2018 measurement, in part due to increased wage costs and investment in new payment equipments. Merchants' largest expense stems from merchant service charges (MSC), which are paid to acquirers and are part of external costs. This item totalled nearly 11 b.kr. The cost stemming from debit cards was considerably lower, however: the cost per transaction averaged 55 kr. for debit cards, as opposed to 103 kr. for credit cards. Merchants pay a fee averaging about 0.6% on each debit card transaction and 0.9% on each credit card transaction. For foreign payment cards (credit and debit cards alike), the MSC averaged roughly 0.9%.



Households are of the view that it takes less time to pay by payment card at a physical outlet, or point of sale, than it did in 2018. This reduces households' estimated cost of payments. Therefore, households are of the opinion that efficiency has increased with payment card use. They are also of the opinion that cash payment for goods and services was more time-consuming in 2021 than in 2018. As a result, they find that cash payment has grown less efficient. The majority of households' costs stem from fees they pay for use of payment instruments – mainly for payment card use – at an estimated total cost of around 10 b.kr. in 2021. Each debit card transaction costs households 45 kr. and each credit card transaction around 91 kr. It can also be said that households indirectly pay fees that merchants remit to acquirers via mark-ups on the price of goods and services.



The cost of cross-border payment services is high in comparison with domestic payment services. Fees for cross-border payments are estimated to have totalled just over 760 m.kr. in 2021, including 510 m.kr. for transfers of funds and 250 m.kr. electronic money transfers. On average, each digital cross-border transfer of funds cost 1,921 kr., and each money transfer cost 3,242 kr.

Introduction

I

This report presents the results of the Central Bank's estimate of the private and social costs of retail payments. The data used are from 2021.

It is the role of the Central Bank of Iceland to promote a safe and effective financial system, including domestic and cross-border payments. An element in this is collecting data on various payment instruments and assessing the cost associated with their use. This information provides support for policy-making and decision-making by the Central Bank, and it is important for society as a whole, as payment intermediation plays a key role in economic interactions between members of society. Awareness of the costs associated with retail payment intermediation makes it possible, among other things, to determine whether it is more economical to use one payment instrument than another and whether fees accurately reflect the cost of operating payment instruments and payment services.

The estimated cost of retail payments discussed here does not take into consideration the societal benefit of using payment instruments; i.e., it does not examine the extent to which payment instruments meet the needs of users and society more broadly. When a comprehensive appraisal of the efficiency of payment instruments is carried out, it takes into consideration both the benefits and the costs. Such an appraisal can indicate that a payment instrument assessed as more costly than an alternative may provide greater societal benefit, thereby justifying the higher cost to both users and society as a whole.

Contents of the report

Private costs are the sum of internal and external costs. Internal costs derive from all inputs that are contributed by participants in the payment intermediation value chain and are needed to produce, intermediate, receive, and use payment services and payment instruments. Examples of such payment intermediation inputs are investments in payment systems, ATMs, and cash register systems; issuance of cash; the cost of wages for employees who accept payments; insurance; safe deposit boxes; losses due to fraud; and the time needed to use a given payment instrument or payment service. External costs are the costs that participants in payment intermediation pay to other participants for processing and use of payment instruments and payment services.

Social costs are the sum of the above-mentioned inputs (internal costs), less service charges (external costs), as service charges are paid to other participants in the payment intermediation value chain and generate revenues for them. Because of this, costs would be overestimated if no adjustment were made for these charges. Fees paid to other participants in the payment intermediation value chain are therefore not included in social costs. If fees are paid to parties outside the value chain, however, they are included in social costs. The cost estimate methodology is discussed in Section III, and the data used for the estimate are discussed in Section IV.

The results of the cost estimate are presented in Section V.

They include the following:

- An estimate of private costs, by participant; i.e., payment service providers, merchants, and households. Presented alongside payment service providers' private costs are their revenues from payment intermediation.
- An estimate of the social cost of different payment instruments and payment services.
- An estimate of the service charges for cross-border transfer via online bank, app or cashier on the one hand, and for cross-border money transfer on the other.

Section VI compares the findings with the results of a comparable estimate carried out in Norway.

The method and its limitations

This report presents the results of an estimate of the cost associated with the payment instruments that are most commonly used in Iceland: payment cards (debit and credit cards), BNPL¹ solutions, cash and online banks, payment apps, and bank cashiers for transfers of funds in Iceland or abroad. A breakdown of costs by value chain participant is also presented. Data for 2021 were collected from payment service providers in 2022, and households and merchants were surveyed in 2022.

Any estimate of the cost of payments is subject to many uncertainties, and making comparisons between periods and countries is often complicated. There are a number of reasons for this. First of all, it is difficult to capture the large number of intermediaries involved in the manufacture of payment instruments, and parts of payment intermediation are often outsourced to entities that provide service to payment service providers.² Second, some of the costs are based on subjective estimates, including estimated time consumption for a given payment instrument or payment service. Third, more people use electronic payment instruments – such as payment apps in smart devices – to pay for goods and services now than in the past. Similarly, the systems and equipment used to intermediate payments between participants have evolved, with some becoming obsolete and being

supplanted by others. Because of these factors, it is not always possible to compare individual payment instruments from one period of time to another. Fourth, cross-border comparisons are not precise, partly because of potential differences in data collection methods, the participants included in the cost estimate, and the classification of costs as private or social. Norges Bank published a cost analysis in 2022, in which it classified participants in the payment intermediation value chain as Norges Bank, households, businesses, payment service providers, subcontractors, and public sector institutions.³ In the Bank of Finland's cost estimate, also published in 2022, inputs from households and payment card acquirers were excluded, apart from the fees paid by commercial banks to acquirers.⁴ In the analysis underlying the present report, public sector institutions are excluded, and payments using payment cards are settled not between acquirers and banks but through VISA and Mastercard. This must be borne in mind in any interpretation of the results, but nevertheless, the results do give an indication of the current situation and developments over time.

Regular data collection and cost estimates

The Central Bank has prepared estimates of the social cost of payments, as neighbouring countries have. These previous estimates were based on data from 2014 and 2018.⁵ The results of the estimate of service charges and participants' private costs are published for the first time in this report.

The Bank has decided to gather information on the cost of payments on a regular basis. Each year, service charges for payment services and use of payment instruments in Iceland will be compiled. Every two to three years, an estimate will be made of the social cost associated with payment instruments. The Bank aims to release the results of these assessments in this publication.

1. BNPL solutions are used for account-to-account payments, paid via online bank or smart device app. In Iceland, the most commonly used such solution is Netgiró.

2. A payment instrument may be either tangible or intangible. Examples of tangible payment instruments are cash and physical debit or credit cards. Intangible payment instruments include (but are not limited to) digital wallets and digital currency. The term payment service refers to transfers of funds between bank accounts or cross-border money transfers.

3. The cost analysis from Norges Bank can be found [here](#).

4. The cost analysis from the Bank of Finland can be found [here](#).

5. The previous cost estimates were published (in Icelandic) in the Bank's *Fjármálainnviðir* [Financial Market Infrastructure] reports in 2016 and 2018. Publication of *Fjármálainnviðir* has since been discontinued.

Payment instruments and payment services

According to Article 3, Item 16 of the Payment Services Act, no. 114/2021, a payment instrument is defined as any type of equipment and/or procedure on which a provider and user of payment services agree to use to give payment instructions. Debit cards and credit cards are examples of tangible payment instruments. Intangible payment instruments could be digital wallets and digital currency.

According to Article 3, Item 22 of the same Act, payment services are defined as including the following: deposits of cash to a payment account, electronic transfers of funds between payment accounts, issuance of a payment instrument, or execution of a money transfer.

Scope of payment intermediation



Domestic retail payments

Most households in Iceland use payment cards to pay for goods and services at physical outlets in the domestic retail market – either directly or indirectly, using a smart device to which a payment card has been linked. About 92% of households’ payments for goods and services were made with cards in 2021, for a total of nearly 155 million transactions. In 2021, some 7.5% of all household transactions at physical outlets were paid for in cash,⁶ or just under 13 million transactions, while 0.7% (about 1 million transactions) were paid for by other means such as BNPL solutions. The Central Bank issues cash (banknotes and coin) and circulates it to banks and savings banks. In order to use cash for retail trade, the buyer must have acquired it from a bank cashier or ATM, or in some other way. In this analysis, the portion of the cost deriving from with-

drawals via ATM and cashier is included in the cost of the use of cash, but not in the cost of acquiring cash by other means.

In 2021, there were about 22.7 million transactions with payment cards issued to individuals in Iceland and used abroad. On the other hand, there were roughly 13.9 million transactions with cards issued abroad and used in Iceland, or about 8% of domestic payments.

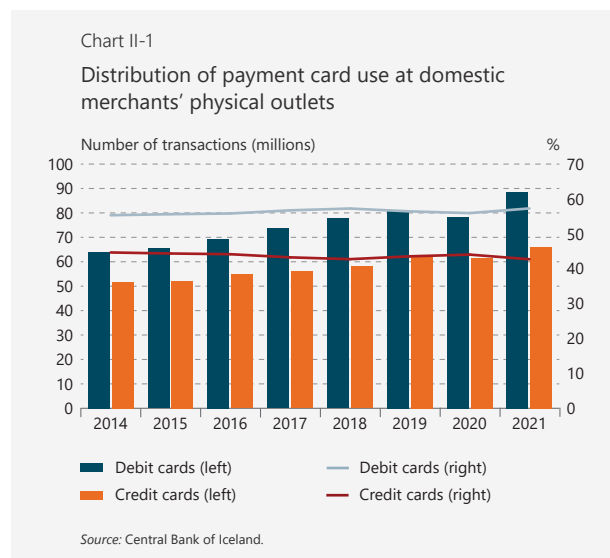
Table II-1 Number of transactions at merchants’ physical outlets, by payment instrument

| Payment instrument | Transaction volume, in millions | Share, % |
|-------------------------------|---------------------------------|----------|
| Payment cards, domestic | 154.6 | 91.8 |
| online shopping | 17.7 | 11.4 |
| Cash ¹ | 12.7 | 7.5 |
| Other, such as BNPL solutions | 1.1 | 0.7 |
| Total | 168.4 | 100.0 |
| Payment cards, foreign | 13.9 | 8.0 |

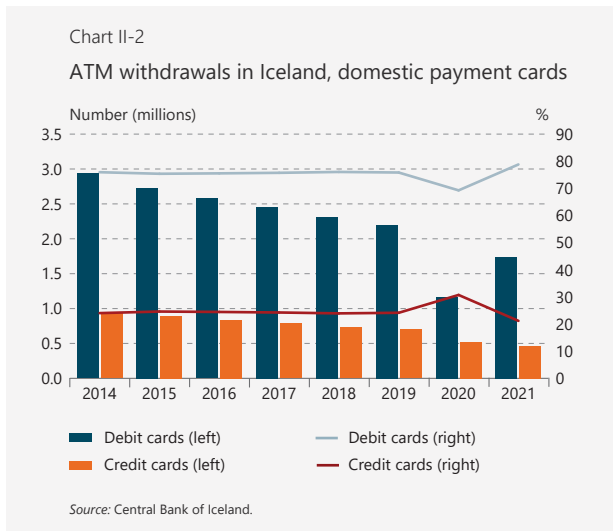
1. Estimated from Gallup survey and Central Bank calculations.

Source: Central Bank of Iceland.

6. The share of cash is estimated from the results of the Gallup survey on households’ payment behaviour. Further information on the survey and the use of cash can be found in [Financial Stability 2022/2](#).



Another way for households to pay for goods and services is to transfer funds to merchants via online bank, payment app, or bank cashier; however, only a small percentage of payments are made this way, as it is time-consuming for both merchant and customer. On the other hand, the vast majority of households use one of these three methods to pay bills or transfer funds to another individual. It is estimated that nearly



48 million electronic transfers were made between individuals' accounts in Iceland in 2021.⁷

Unlike households, many companies have accounts with merchants and settle them, often through the online banking claim system, before the end of the agreed period.⁸ This portion is not included in the cost analysis, nor are public institutions that charge households for various fees such as property tax and motor vehicle tax.

Cross-border payments

Cross-border transfers of funds are executed via online bank, banking app, or bank cashier. It is also possible to execute a transfer via money transfer services, including by using a service provider's website. An estimated 287,000 cross-border transfers were made by individuals in Iceland in 2021, some 22,000 of which were money transfers.

7. According to information from RB and Central Bank calculations. The portion of invoices that households pay to companies and public institutions is not included in the calculation of the cost of retail payments presented here.
8. The claim system is a centralised, electronic solution in Icelandic payment intermediation that enables the payment of claims and invoices. Those who establish and collect claims via online bank pay their commercial bank a fee for the service.

Methodology



The cost estimate is based on methodology used by the European Central Bank and Norges Bank, which use similar approaches. The Central Bank also used this methodology for its 2014 and 2018 estimates of the social cost of retail payments in Iceland.⁹ The method used here is to classify participants in the payment intermediation value chain as direct participants (three categories) and indirect participants (one category).

Direct participants are as follows:

- Payment service providers (like banks, savings banks, and acquirers) that, on the one hand, grant households access to payment instruments and payment services and, on the other, provide services to merchants so that they can accept payments from households.
- The Central bank, which issues banknotes and coins.
- Merchants that accept payments from households and use payment intermediation services provided by payment service providers and subcontractors to settle payments and to operate payment equipment, among other things.
- Households that use payment instruments and payment services to pay for goods and services and who transfer funds to other individuals' bank accounts. Payments made by individuals to legal entities, other than retail stores, are not included in the analysis.

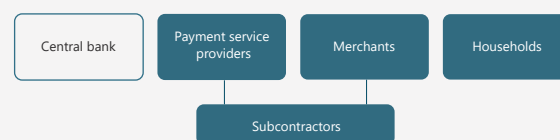
Indirect participants are as follows:

- Subcontractors to whom payment service providers outsource a portion of their payment intermediation activities. Many merchants also use

subcontractors' services to intermediate electronic payments. Subcontractors include the international payment card companies that serve the Icelandic card market, RB (IT service provider for Icelandic financial institutions), the banknote vault, data utilities, and companies that lease payment intermediation equipment.

Chart III-1

Participants in the payment intermediation value chain



Source: Central Bank of Iceland.

The following aspects of payment intermediation are assessed in this analysis:

1. Payment instruments that households generally used to pay for goods and services at the time data were being collected; i.e., payment cards (debit and credit cards), cash, and BNPL. Payment cards were then categorised according to whether they were used physically at a point-of-sale (POS) machine or were used via smart device (phone or watch).
2. Person-to-person (P2P) payment services used by households to transfer funds to another individual; i.e., via bank cashier or online bank, banking app in a smart device, and payment app (Aur and Kass) based on card infrastructure. Also included are services households use to transfer funds or send money overseas.

9. The previous cost estimates were published (in Icelandic) in the Bank's *Fjármálainnviðir [Financial Market Infrastructure]* reports in 2016 and 2018. Publication of *Fjármálainnviðir* has since been discontinued.

It is not possible to distinguish all cost factors in terms of whether the user is an individual or a company. This does not weaken the analysis, however, as the same payment infrastructure must be in place to intermediate payments, irrespective of who the user is and how many transactions are executed.

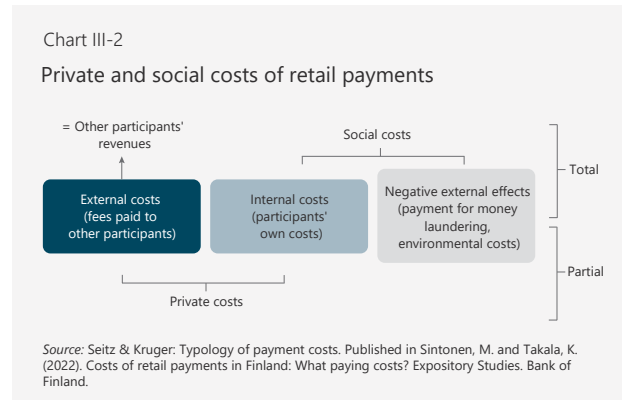
Private and social costs

The analysis includes estimates of both private costs and social costs.

Private costs can be broken down further into internal and external costs. Internal costs are the participant's own production costs; i.e., the inputs the participant needs for payment intermediation. External costs are all types of service charges that participants pay to other participants in the value chain. Private costs can also be split into fixed and variable costs.

Social costs are the resources that participants in payment intermediation contribute so as to make

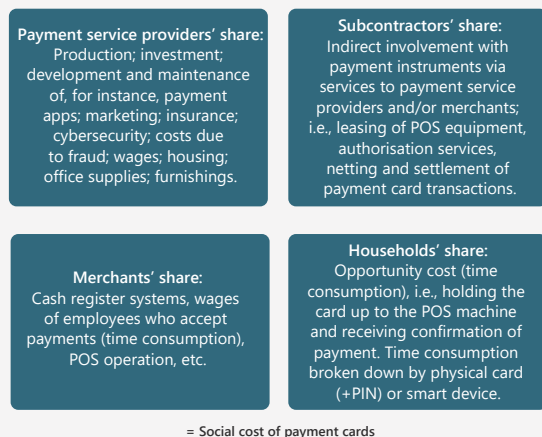
it possible to execute payment; i.e., private costs net of service charges (external costs). Service charges are therefore not considered social costs, as the fee paid for use of a payment instrument in the payment intermediation value chain generates revenues for other participants in the chain. Because of this, costs would be overestimated if no adjustment were made for these charges.



Box 1

Internal and external costs of payment card

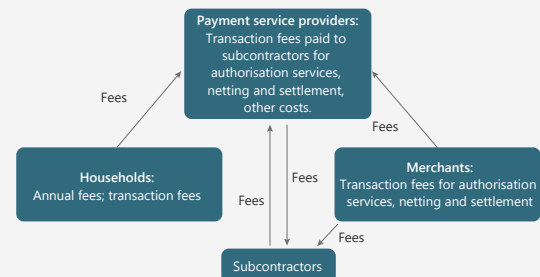
Chart 1
Social costs (internal costs) of payment cards



Source: Central Bank of Iceland.

Chart 1 shows which cost items could fall under the social (internal) cost of payment cards for each individual participant; i.e., the inputs that participants contribute to society in order to sustain payment cards as payment instruments.

Chart 2
Fees for payment cards (external costs)



Source: Central Bank of Iceland.

Chart 2 illustrates external payment card costs; i.e., the charges paid by each participant to another participant for use of a payment card at a physical outlet. For example, households pay annual fees to banks and savings banks for use of payment cards. It can also be said that households indirectly pay fees that merchants remit to acquirers via mark-ups on the price of goods and services.

Payment service providers

For payment service providers, internal costs may include the wages of those who work in payment intermediation, payment equipment such as ATMs, information systems, the value of the facilities where payment intermediation takes place, and development of and investment in new payment solutions. Payment service providers also bear the expense of insurance, fraud, premia or interest for the settlement period (i.e., the period between purchase and payment) in the case of credit card use, and transport and storage of banknotes and coin. In part, payment service providers' costs are incurred by subcontractors; i.e., licensing fees, authorisation of transactions, and clearing.¹⁰ Subcontractors' payment intermediation costs are levied on payment services in the form of fees (external costs), which are part of service providers' private costs.

Merchants

For merchants, internal costs include the wages of employees who accept payments, payment equipment such as cash register systems, security equipment, transport of banknotes and coin to the bank, and other cost outlays. External costs are the fees (external costs) paid to participants that provide payment services to merchants, mainly in connection with payment card use.

Households

For households, internal costs lie primarily in the value of the time it takes to pay for goods and services using a given payment instrument. At a physical outlet, for instance, this is the time it takes to open a smart device, hold it up to the contactless POS machine, and receive confirmation from the merchant. Another example is the time it takes to obtain cash, give it to the merchant, and receive change, if any. Similarly, time consumption is measured when an individual withdraws cash from an ATM; i.e., the time it takes to gain access to the ATM, insert the payment card, enter the PIN and amount to be withdrawn, take the cash from the machine, and receive confirmation of the withdrawal. The consumption of time is included with internal costs, as the time it takes to pay for goods or withdraw funds from an ATM could have been used for work or other activities that are measured in terms of wage expense. For households, external costs are much higher than internal costs. Examples of external costs

are annual payment card fees, transaction fees charged by banks for their services, and fees charged for cash withdrawals via ATM or bank cashier.

10. Further information on authorisation of transactions and clearing can be found here: https://www.sedlabanki.is/library/Skraarsafn/Serrit/Serit_nr_16_ohad_greidslulausn.pdf (only available in Icelandic).

Unit costs of payment

Private costs can be split into fixed and variable costs. Fixed costs are costs that are independent of production volume; i.e., they are the same, no matter whether 2 units or 200,000 units are produced. Variable costs are those the change with changes in production volume.

In payment intermediation, fixed costs are equal to the ratio of total costs, particularly in the case of electronic payment instruments such as payment cards, which means that the cost of each transaction falls as the number of transactions rises. Transaction volumes rise as a given payment instrument gains in popularity, and they also rise with increased private consumption growth. Both of these factors affect the unit cost. Iceland has a small population, and it is therefore unsurprising that the unit price in Icelandic payment intermediation is somewhat higher than in larger societies. In general, it is however, possible to lower unit costs by using relatively few core infrastructure elements for payment intermediation.¹ Variable costs are higher for

cash than for electronic payment instruments because use of cash depends more heavily on the volume of banknotes and coin, including cash distribution, execution of cash withdrawals, and acceptance of cash payment.

Another factor that can affect the unit price in the short run is investment in new infrastructure and development of payment equipment: unit prices can rise initially if transaction volumes remain unchanged, but later on they should decline, provided that infrastructure remains unchanged and transaction numbers rise. On the other hand, different payment instruments may require different infrastructure. For example, it may not be possible to use the same infrastructure for online card-based payments and for card-based payments at a physical outlet. Similarly, some payments – card-based payments and BNPL solutions – are routed through POS systems and cash register systems.

1. Further information on the operation of payment intermediation infrastructure and competition in the market can be found in Central Bank of Iceland report's *Sérrit nr. 16: Umræðuskýrsla. Innlend, óháð smágreiðslutlaus* (only available in Icelandic).

Data compilation

IV

Payment service providers

The data compiled in 2022 were obtained from banks, savings banks, acquirers, and other providers of payment instruments or payment services, and included the cost of payments in 2021. A questionnaire was sent to respondents, who were asked about payment intermediation cost items and payment service revenue items in accordance with the activity-based costing (ABC) methodology.¹¹ The questionnaire has changed since it was first set out in 2014, primarily because of technological advances and new payment service solutions. In order to estimate total service charges for payments and the share due to use of domestic cards in Iceland, the questionnaire included questions on itemisation of service charges for use of domestic payment cards (in Iceland and abroad) and charges for use of foreign payment cards in Iceland. The cost of cash issuance in 2021, compiled by the Central Bank, falls under social costs. It is not a given that all of the cash issued in 2021 was used that year for person-to-person payments or point-of-sale transactions, as a portion of it could be stored in safe deposit boxes, banks, or private homes. It is impossible to separate that portion out, and as a result, the total cost of cash issuance during the year is included.

The Central Bank did not assess the reliability of the data submitted by payment service providers other than to compare the figures with historical data and query costs that were unclear, unusually high or low,

or inconsistent with previous data. Explanations of cost and revenue items were provided in all cases. In a few instances, it was not possible to itemise information in accordance with the Central Bank's request for the cost of various payment instruments because the costs were the same, irrespective of the type of instrument. In those cases, the cost was estimated on a pro rata basis, in accordance with the transaction volume for each instrument. Furthermore, payment intermediation operations are not necessarily separated from payment service providers' other activities. For example, financial institutions may use the same payment system for payment instruments and for other services such as asset management, investment, and lending. In the questionnaire, payment service providers were asked to estimate the share of payment instruments and payment services in jointly utilised infrastructure. Respondents provided these estimates to the best of their ability.

Merchants

The estimate of retail merchants' costs is based on the results of a survey carried out by Gallup for the Central Bank of Iceland in summer 2022. As with previous analyses, it was difficult to get merchants to participate, and the response ratio was about 32%. As a result, it was decided to compare the survey findings with information gathered in preparation of the 2018 cost analysis. That year, the Central Bank met with leaders in the grocery and fuel markets in order to estimate payment intermediation as a share of their total retail turnover. A questionnaire was also sent to several

11. Activity-based costing is used to analyse the cost of various tasks or functions and to determine how costs are distributed among them. The questionnaire sent to payment service providers is based on this method and is comparable to similar analyses carried out abroad.

smaller merchants. The results indicated that payment intermediation accounted for around 5-7% of total turnover. The percentage was slightly lower in the 2022 Gallup survey than in the findings from 2018, which is normal, given the increased use of automated cash registers during the intervening years. Furthermore, in order to measure the value of retail workers' time, information on service and sales employees' average regular income in 2021 was compiled and posted on the Statistics Iceland website.

Households

Information on households' costs was gathered with a survey conducted by Gallup in 2022. In that survey, households were asked about their use of various payment instruments and their estimate of the time it took to use the instruments at merchants' physical outlets. Also, in order to measure the value of the time it took households to use specified payment instruments and services, the Central Bank gathered information on average regular wages in 2021 for publication on the Statistics Iceland website.

Subcontractors

Subcontractors are defined as indirect participants, as they provide services to payment service providers and merchants, thereby enabling them to generate, intermediate, and accept payments. Subcontractors could be operators of data utilities, transaction authorisation systems, transaction netting and settlement (VISA and Mastercard), transport and/or storage of cash, POS machine leasing, cash register systems for merchants, etc.

Compilation of data on turnover and transaction volume

Information on turnover with domestic payment cards (debit and credit) was gathered from the Icelandic Centre for Retail Studies, and payment card transaction volume data were obtained from the Central Bank of Iceland database. The number of cash transactions was estimated from the results of the aforementioned survey of households, plus estimated cash turnover. This approach has its limitations, of course, but it can still provide an indication of the costs households bear as a result of using cash. Furthermore, information on transaction volume and turnover in cross-border trans-

fers (SWIFT and SEPA payments)¹² was gathered from the Central Bank database, and information on transfers between bank accounts (turnover and transaction volume) was obtained from RB.

12. SWIFT payments are transactions made through an intermediary bank that allows customer to send/receive electronic payments internationally. SEPA payments are for Euro transfers between any of the EU countries and Norway, Iceland, Switzerland, Monaco, and Liechtenstein.

Cost analysis results



Payment service providers' private costs and revenues

Banks and savings banks play a key role in the payment intermediation value chain, as all electronic transfers and cash withdrawals are debited from a bank account at some point. Banks and savings banks also issue payment cards and provide access to payment intermediation equipment; i.e., online banking, payment apps, and ATMs. Acquirers have a business relationship with merchants that enables them to accept card-based payments. There are also other payment service providers in the domestic payment market. These include BNPL solution such as Netgíró, which is defined as a payment instrument; and payment apps Aur and Kass, which provide for account-to-account transfers and are defined as payment services.

Payment service providers bear the highest payment intermediation costs, estimated at just under 38 b.kr. in 2021. Of that total, they paid 13.2 b.kr. in fees (external costs) to payment intermediation subcontractors. Their share in total costs is estimated at around 55%. Offsetting this were payment service providers' total revenues in the amount of 27 b.kr. The result was a loss of nearly 11 b.kr. on payment intermediation, with cash withdrawals and payment services generating a loss and payment card operations generating a profit. The largest profit was on credit cards.

It is expensive to operate infrastructure for cash when few people use it to pay for goods and services. The operating cost associated with cash withdrawals has fallen in recent years, however, owing in part to an increase in the number of ATMs and a decrease in

the number of bank branches and cashiers. Cash plays an important societal role in contributing to effective and secure payment intermediation, and even though use of cash has declined sharply, it is necessary to ensure that it remains accessible to the public.¹³ In addition, there are costs involved in operating payment service infrastructure. Some of those costs stem from operation and maintenance of payment equipment for online banking, banking apps, and other payment apps. At the same time, it can be assumed that it is more difficult than before to generate revenue from payment services, including from P2P transfers, as these are largely carried out on a self-serve basis.

Table V-1 Payment service providers' private costs and revenues

| B.kr. | Social costs (A) | Fees (B) | Private costs (A+B) | Gross revenues | Net revenues |
|------------------|------------------|----------|---------------------|------------------|--------------|
| Cash | 2.7 | 0.9 | 3.6 | 0.5 | -3.1 |
| Payment cards | 12.3 | 4.7 | 17.0 | 25.8 | 8.8 |
| debit cards | 6.4 | 1.7 | 8.1 | 8.8 | 0.7 |
| credit cards | 5.9 | 3 | 8.9 | 17 | 8.1 |
| Payment services | 9.7 | 7.6 | 17.3 | 0.8 ¹ | -16.5 |
| Total | 24.7 | 13.2 | 37.9 | 27.1 | -10.8 |

1. Payment intermediation fees charged to companies by commercial and savings banks are not included. Payment service providers' revenues are therefore higher than is indicated here.

Sources: Survey of payment service providers and Central Bank calculations.

The cost of retail payments was somewhat different in 2021 than in previous surveys, partly because the interest environment was much more favourable in 2021, which lowered the cost of payments, and because

13. Further information on the societal importance of cash can be found in *Financial Stability 2022/2*.

there was less activity – in development and marketing of payment equipment, for example – because of the pandemic. Payment intermediation-related wage costs declined as well, partly because of an increase in self-serve transactions via ATM at the expense of transactions via bank cashier. On the other hand, some cost items increased; for example, those due to cybersecurity and payments to ApplePay. When all items were added together, however, the results indicated that total costs were virtually the same in 2021 as in 2018.

Payment service providers' unit costs and revenues

Use of cash is estimated to have cost payment service providers an average of 235 kr. per transaction, which was offset by income amounting to just under 33 kr. per transaction. These findings suggest that banks and savings banks use income generated by other operations to cover the cost of cash and payment services. On the other hand, payment service providers generated a profit on payment card use. Credit cards were far more profitable, generating nearly 122 kr. per transaction, on average, as compared with 8 kr. for debit cards.

Table V-2 Payment service providers' unit costs and revenues

| Kr. | Costs (unit) | Revenues (unit) | Net revenues (unit) |
|------------------|--------------|-----------------|---------------------|
| Cash | 235.1 | 32.7 | -202.4 |
| Payment cards | 109.6 | 166.4 | 56.8 |
| debit cards | 91.5 | 99.4 | 7.9 |
| credit cards | 133.8 | 255.6 | 121.8 |
| Payment services | 78.4 | 16.9 | -61.5 |
| Total | 101.7 | 72.7 | -29.0 |

Sources: Survey of payment service providers and Central Bank calculations.

Merchants' private costs

Merchants' private costs are estimated at just under 15.5 b.kr. in 2021 and their share in total payments costs around 22%. Their private costs from use of cash, totalling roughly 1.9 b.kr., covered reconciliation and settlement, receipt of cash from customers, transport of cash, security equipment, and insurance, among other things. Their costs due to payment cards came to an estimated 13 b.kr. Internal costs were just under 1 b.kr. higher than in the 2018 measurement, mainly because of increased wage costs and investment in new payment equipment. Merchants participating in

the Gallup survey also reported that it took longer than before to handle cash, which increases the cost associated with it. On the other hand, larger merchants were able to streamline in their operation of payment equipment, which lowered their payment intermediation-related cost. However, the main costs is in the form of fees (external costs), which are part of their private costs.

Table V-3 Merchants' private costs

| B.kr. | Social costs (A) | Fees (B) | Private costs (A+B) | Unit cost |
|--|------------------|----------|---------------------|-----------|
| Cash | 1.9 | 0.0 | 1.9 | 166.5 |
| Payment cards | 2.1 | 10.8 | 13.0 | 76.7 |
| debit cards | 1.3 | 3.9 | 5.1 | 55.2 |
| credit cards | 0.9 | 7.0 | 7.8 | 102.9 |
| Payment services | 0.5 | 0.1 | 0.6 | 4.2 |
| Total | 4.5 | 11.0 | 15.5 | 48.0 |
| - domestic payment instruments, households | | 7.2 | | |

Sources: Gallup survey 2022, survey of payment service providers, Central Bank calculations.

The biggest expense item is the merchant service charge (MSC).¹⁴ This item totalled nearly 11 b.kr. It is merchants' largest cost item because households primarily use payment cards to pay for goods and services. Private costs were considerably lower for debit card use (just over 2 b.kr.) than for credit card use. The cost of using other payment instruments was very low. Even though merchants' private costs associated with use of cash are low in comparison with the cost of payment card use, the cost per cash transaction was much higher, at nearly 167 kr., on average, as opposed to 77 kr. per payment card transaction. The cost stemming from debit cards was considerably lower, however: the cost per transaction averaged 55 kr. for debit cards, as opposed to 103 kr. for credit cards.

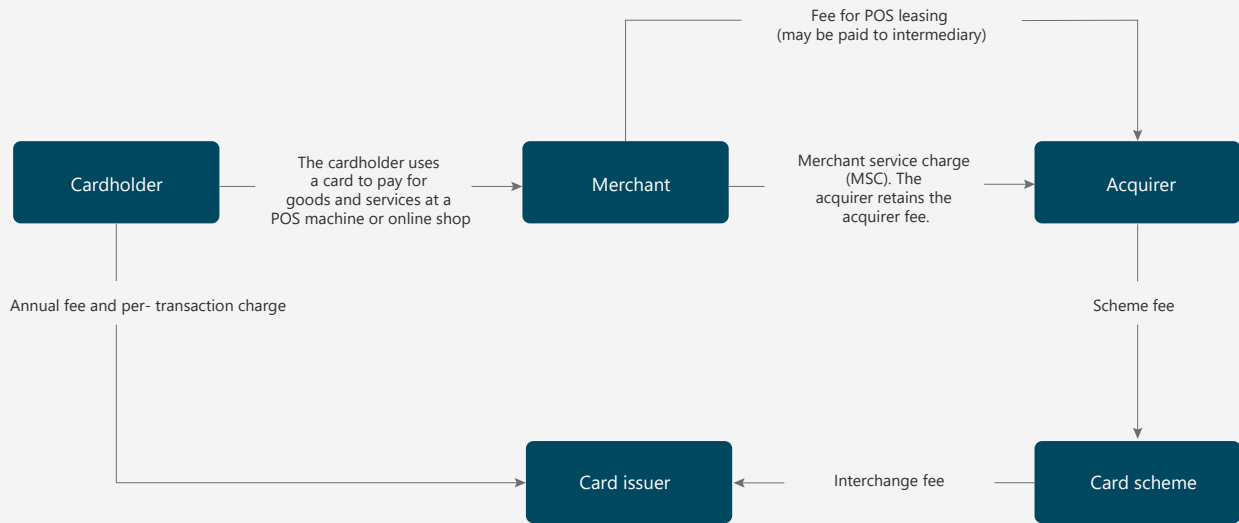
The payment card value chain

Merchant enter into agreements with acquirer (payment service provider) concerning service on payment instruments. These agreement provide for both a fixed charge and a per-transaction charge, the MSC. The MSC comprises an interchange fee, a network fee or scheme fee, and an acquirer fee. According to the Act on Interchange Fees for Card-Based Payment Transactions, no. 31/2019, service providers' interchange fees are

14. For further explanation, see the section on the payment card value chain.

Chart V-1

The payment card value chain



Source: Central Bank of Iceland.

capped at 0.2% for transactions using debit cards issued by commercial and savings banks to individuals, and 0.3% for credit card transactions. The Act does not apply to corporate cards; therefore, it is permissible to charge a higher interchange fee for corporate cards than for those held by individuals. In addition, merchants pay higher fees when foreign payment cards are used, as there are currency exchange fees and generally higher interchange fees, among other things. It is therefore unsurprising that merchants that provide services to foreign tourists pay proportionally higher payment intermediation fees. Furthermore, it can be assumed that larger merchants pay lower fees to acquirers because of their stronger negotiating position.

According to the calculations, the average MSC paid by merchants to acquirers in 2021 came to an estimated 0.6% per debit card transaction and 0.9% per

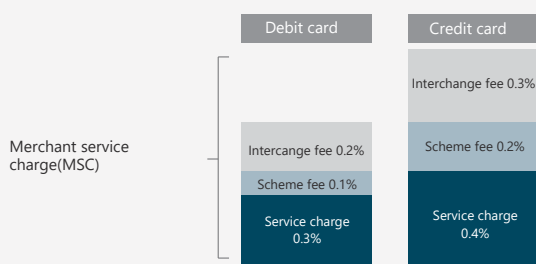
credit card transaction. For foreign payment cards, the MSC averaged roughly 0.9%.

Households' private costs

Households' share in payment costs is estimated at 23% and their private costs around 16 b.kr. Of that amount, households paid some 10 b.kr. in fees. Households' internal costs for payments consist primarily of time consumption. Households estimated that it took less time in 2018 than in the previous survey to pay by card at a physical outlet, which lowers their estimated costs. On the other hand, they reported that it took longer to pay in cash. Furthermore, households noted that of the payment instruments covered in the survey, it took the shortest time to use smart device apps to pay for goods and services at a physical outlet. However, wages rose during the period, which is accounted for in the measurement of time consumption. For the most

Chart V-2

Merchant service charge (MSC)



Source: Central Bank of Iceland.

Tabla V-4 Households' private costs

| B.kr. | Social costs (A) | Fees (B) | Private costs (A+B) | Unit cost |
|------------------|------------------|----------|---------------------|-----------|
| Cash | 0.6 | 0.5 | 1.1 | 68.7 |
| Payment cards | 2.2 | 9.1 | 11.3 | 65.0 |
| Debit cards | 1.3 | 3.2 | 4.4 | 45.1 |
| credit cards | 1.0 | 5.9 | 6.9 | 90.6 |
| Payment services | 2.9 | 0.6 | 3.5 | 35.2 |
| Total | 5.6 | 10.2 | 15.9 | 42.6 |
| - domestic use | | 7.1 | | |

Source: Central Bank of Iceland.

part, though, households' payment costs stem mainly from fees (external costs), just as merchants' costs do. The fees in question are annual payment card fees and various transaction fees.

Households' external costs of using payment instruments and payment services vary, and in some instances there are no costs. Per-transaction costs are not high in krónur terms, but they can add up to a considerable sum and can be proportionally high when the transaction value is low. For example, households pay a transaction fee for using a debit card to pay for goods and services at a physical outlet, but they pay no such fee for using a credit card to do so. They also pay a fee when they use their domestic payment card to withdraw cash from an ATM abroad or in Iceland – but not if the card issuer is the operator of the ATM in question. Furthermore, commercial and savings banks charge currency exchange fees on all payment card use abroad, as well as on withdrawals or deposits of foreign currency. The above-mentioned fees are direct costs incurred by households, and it can be said that the fees merchants pay to payment service providers are paid indirectly by households via price mark-ups.

Table V-5 Payment fees paid by households

| Fees | Collecting party | Type of fee ¹ |
|--|---|--|
| Annual fee and production fee | Commercial and savings banks | Payment card issuance |
| Monthly fee | BNPL operators | Merchants' use of BNPL |
| Transaction fee | Commercial and savings banks | Debit card use at domestic merchants; payment card use abroad |
| Cash withdrawal | Commercial and savings banks | Cash withdrawals from domestic ATMs using credit cards; cash withdrawals from bank if card issuer and ATM owner are not the same party; all ATMs abroad; withdrawals via cashier in Iceland and abroad |
| Currency exchange | Commercial and savings banks | FX withdrawals from ATMs using payment cards; FX withdrawals from/deposits to bank account via cashier |
| Transfers | Commercial and savings banks and providers of cross-border money transfer services | Electronic cross-border transfers and money transfers |
| Payment summaries, notifications, statements | Commercial and savings banks, BNPL, and providers of cross-border money transfer services | Electronic payment slips; payment slips |

1. Prices according to payment service providers' tariffs. In some instances, students and retirees are exempt from banks' transaction fees.

Source: Central Bank of Iceland.

The costs of payments

The estimated social cost of using payment instruments in Iceland in 2021 was around 47 b.kr. at that year's price level, or 1.43% of GDP, including subcontractor costs amounting to about 11.6 b.kr. Excluding households, whose costs are based mainly on time consumption, the cost is estimated at 1.26% of GDP. In 2018, the social cost was estimated at 1.60% of that year's GDP. As these figures show, the social cost of payment intermediation has declined relative to GDP. The share of social costs stemming from payment card use was 43%, and the share stemming from use of payment services was 44%. The remaining 13% was due to use of cash.

Table V-6 Social costs, by payment instrument

| | Social cost, b.kr. | Share | % of GDP 2021 | % of GDP 2018 | % of GDP 2014 |
|-------------------------------|--------------------|-------|---------------|---------------|---------------|
| Cash | 5,2 | 13 | 0,18 | 0,35 | 0,30 |
| Payment services ¹ | 20,5 | 44 | 0,63 | | |
| Payment cards | 20,1 | 43 | 0,62 | 1,25 | 1,10 |
| debit cards | 10,6 | 23 | 0,33 | 0,62 | |
| credit cards | 9,5 | 20 | 0,29 | 0,33 | |
| Total | 46,5 | 100 | 1,43 | 1,60 | 1,40 |

1. The cost incurred by subcontractors as indirect participants is calculated as a share of social costs and is included in direct participants' private costs.

Source: Central Bank of Iceland.

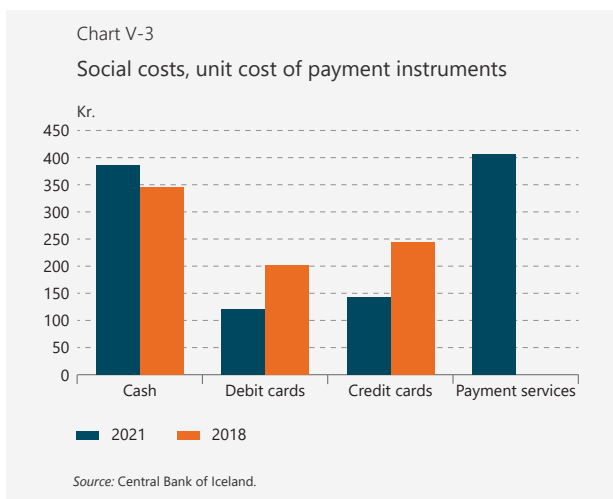
As is noted above, payment service providers' internal costs held virtually unchanged between 2018 and 2021, at about 71% of the combined internal costs of direct participants. Merchants' social costs rose, while households' social costs fell. As is explained above, households' share of social costs is measured solely in terms of the value of time consumed. The 2018 and 2021 results are not fully comparable, as the cost of payment card is now classified as a payment service, whereas it previously fell into the payment card category.¹⁵

Cost efficiency in payment intermediation is best estimated by comparing the unit price of the various payment instruments. With greater streamlining in payment intermediation and increased transaction volumes, the social cost per transaction declined by an average of 12 kr. between 2018 and 2021, or from 36 kr. to 25 kr., irrespective of the type of payment instrument and payment service used. Debit cards came out best in the estimates, with a unit cost of

15. The costs paid by payment service providers to subcontractors as a result of payment cards are recognised as payment services; cf. the methodology used in the analysis.

120 kr., as compared with 142 kr. for credit cards. The comparison of payment cards between years is not precise, however, as the portion of payment services stemming from processing of debit and credit cards was previously considered part of the cost of the cards, as is noted above, whereas it is now considered part of payment services. The unit cost is considerably higher for cash transactions than for card-based transactions because far fewer people use cash. According to the results of the cost analysis, each cash transaction at a physical outlet is estimated to have cost society an average of 385 kr. in 2021, an increase of 40 kr. relative to 2018. Payment services are the most expensive cost item on a per-unit basis, as they include operation and maintenance of payment equipment for online banking, banking apps, and other payment apps. The unit cost of payment services is calculated mainly from the number of household transactions, not business transactions. If business transactions are included, the unit cost is lower.

transfers. On average, each digital cross-border transfer of funds cost 1,921 kr., and each money transfer cost 3,242 kr.



Service charges for cross-border payments

The Central Bank gathered data on service charges for cross-border transfers via online bank, app, or cashier, on the one hand, and for cross-border money transfers, on the other. These costs are not calculated specially as a part of social costs, and the analysis therefore does not consider the private costs. The infrastructure that commercial and savings banks used to transfer payments across borders is considered part of their social costs, however.

Fees for cross-border payments are estimated to have totalled just over 760 m.kr. in 2021, including 510 m.kr. for transfers of funds and 250 m.kr. for money

Comparison



Norway is the only country that can be considered comparable to Iceland and has recently published the results of a payment costs analysis. The Bank of Finland also published an analysis in 2022, but it does not include households' costs and only captures a portion of acquirers' costs.

Interpretation of results and comparison

The following should be borne in mind in any interpretation and comparison of the results. First of all, gíró-based services are still widely used in Norway but are no longer used in Iceland; however, they are not dissimilar to payments routed through the Icelandic claim system (invoices paid via online bank). Second, Norway has a domestic debit card system, BankAxept, which is owned by Norwegian banks that issue BankAxept debit cards. These cards have a dominant market share in Norway and have thus far been the least expensive payment instrument in the country. Third, economies of scale are far greater in Norway than in Iceland, which lowers unit costs. A good example of this is the BankAxept debit card, which is very widespread. Another factor that lowers costs is that the domestic debit card infrastructure is jointly utilised by payment service providers. In Iceland, however, all debit and credit cards issued in the country rely on foreign infrastructure from VISA and Mastercard.¹⁶ Fourth, public institutions are included

in the Norwegian analysis but are excluded from the analysis in Iceland. However, public institutions' costs did not have a strong impact in the Norwegian study on the total cost of payment intermediation. Fifth, households' reported experience of the time invested in using payment instruments differs, with Icelandic households estimating that it takes longer to pay for goods and services with a specific payment instrument (for further explanation, see Box 3).

The cost of retail payments in Norway 2020

In Norway, the social cost of payments amounted to 0.79% of GDP in 2020, or 56% if based on the calculations used by Norges Bank in 2013.¹⁷ Costs are therefore considerably lower in Norway than in Iceland. The social cost of payment card use in Norway remained flat between 2013 and 2020, after adjusting for the reduction in costs at physical outlets and the increase in the cost of online shopping. Each BankAxept transaction is estimated to have cost an average of 3.3 Norwegian kroner, or 47 Icelandic krónur, in 2020, as compared with Iceland's year-2021 average of 120 Icelandic krónur per debit card transaction in 2021.¹⁸ In Norway, the average cost per credit card transaction was around 10.4 Norwegian kroner, or 147 Icelandic krónur, in 2020, as compared with 142 Icelandic krónur in Iceland in 2021. In both Iceland and Norway, these transactions are routed through card infrastructure

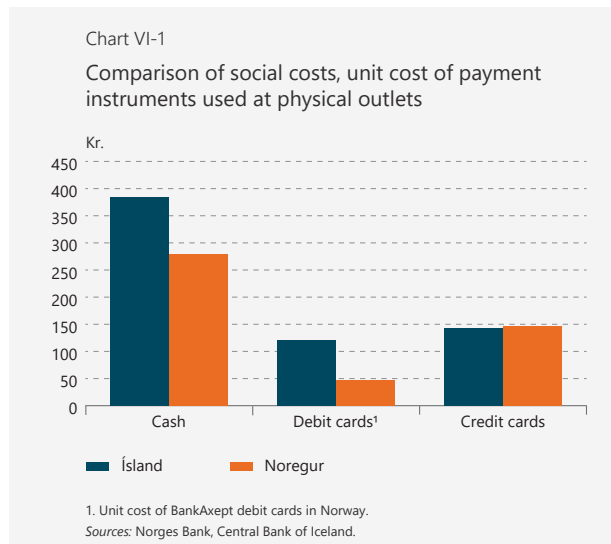
16. Further information on the retail payment infrastructure in Iceland can be found in Central Bank of Iceland report's *Special Publication no. 16/2023 – Discussion report: Independent domestic retail payment solution*. (only available in Icelandic).

17. For further information, see: [Costs in the Norwegian payment system 2020](#).

18. At the average 2020 exchange rate.

owned by international card companies like VISA and Mastercard. The average cost per transaction of using cash increased between surveys in Norway, as it did in Iceland. The reason is the same in both countries: it is more expensive to operate infrastructure for cash business, time consumption is higher than before, and the reduced number of people who use cash pushes the unit cost upwards.

Even though transaction volumes are higher in Norway than in Iceland, payment service providers' profits from payment intermediation were negative, as the results of the Icelandic survey indicate. Service providers' payment intermediation costs totalled 10.2 billion Norwegian kroner in 2020, whereas revenues totalled 7.8 billion kroner. Furthermore, the results are comparable in that banks profit on payment card use but generate considerable losses on the operation of



infrastructure relating to use of cash.

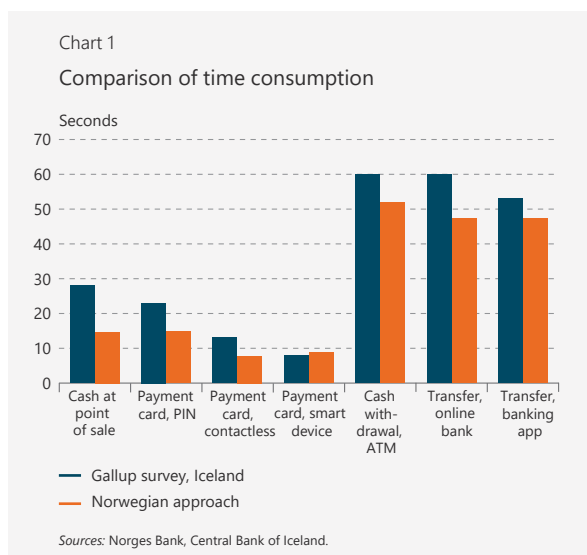
Box 3

Households' perceptions of time consumption

The measurement of social costs included the time consumed in executing payment; i.e., households' perceptions of how long it takes, in seconds, to pay for goods and services with a specified payment instrument. The value of calculating the subjective experience of time as part of the cost of payment is open to debate, as it is not a given that perceived time consumption and actual time spent will be equal, nor is it a given that these variables will be comparable from one country to another. It cannot be assumed that households and merchants have an accurate sense of the time invested in using specified payment instruments, but this is their subjective appraisal, which should be noted in interpreting the data. This approach is used for comparable analyses conducted abroad.

Chart 1 shows time consumption as estimated by households according to the Gallup survey, on the one hand, and the Norwegian measurement, on the other.¹ The results indicate that households' share would be lower by

0.04% of GDP in Iceland, or 0.13% as opposed to 0.17% if time consumption had measured the same in both countries. This increases the cost of payments but on the other hand, regular wages in Iceland are lower, on average, than in Norway, which lowers the social cost.



1. For further information, see: [Costs in the Norwegian payment system 2020](#).



THE COST OF RETAIL PAYMENTS
2023