

DANMARKS NATIONALBANK

22 FEBRUARY 2022 — NO. 2

Denmark is among the most digitalised countries when it comes to payments

Most payments in Denmark are digital. The digital behaviour of senior citizens is a key element in making Denmark one of the most digitalised countries when it comes to payments.

88 per cent

of payments in physical trade are digital. Consumers typically pay by payment cards or mobile phones.

[Read more](#)

2 out of 3

person-to-person payments are instant payments. In Denmark, take-up and usage of instant payments have progressed faster than in other countries.

[Read more](#)

1 in 5 payments

in physical trade is a mobile payment. Since 2019, the use of mobile payments has more than doubled.

[Read more](#)

Digitalisation

is broadly anchored in the population. Danish consumers over the age of 60 use digital solutions to a greater extent than their counterparts in other countries.

[Read more](#)

Digitalisation

The digital transformation is progressing rapidly in these years, and Denmark and the other Nordic countries are currently among the most digitalised countries in the world.

Digitalisation brings changes. Obvious changes are in the way we purchase and pay for goods and the way we transfer funds to each other. But increased digitalisation and new digital technologies may also affect the growth potential of the economy and labour market developments. Prices of goods, trade, financial sector stability and the way we calculate the digital economy are also impacted by digitalisation.

In a series of publications, Danmarks Nationalbank focuses on the digital development and its significance for the economy.

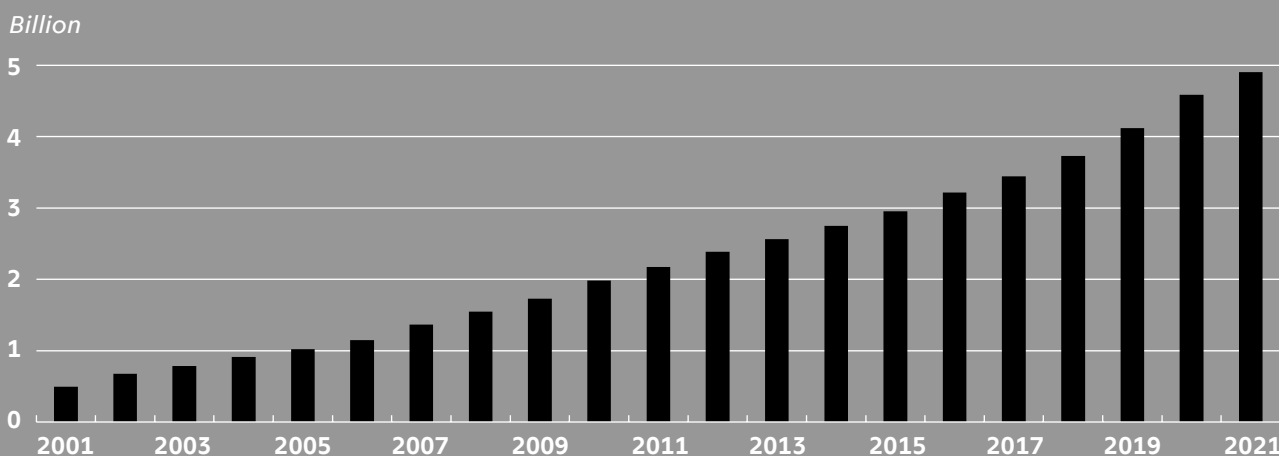
ABOUT THIS ANALYSIS

Danes opt for digital payments

In Denmark, consumers typically use their payment card or mobile phone when paying for goods and services. Digital behaviour is broadly anchored in the population, and the digital behaviour and internet usage of senior citizens emphasise Denmark's position as one of the most digitalised countries in the world when it comes to payments.

This analysis presents the most important insights into the development of the digital payment behaviour of Danish households based on Danmarks Nationalbank's household survey from 2021.

Online users globally



Most payments in physical trade are digital

In Denmark, digital payment solutions are used for most payments. In 2021, 88 per cent of payments in physical trade were digital, see chart 1, left.¹ This appears from Danmarks Nationalbank's latest detailed survey of the payment behaviour of Danish citizens. This survey was conducted for the third time in the 2nd half of 2021. See box 1 for more information about the survey.

The payment card is still the most widely used payment solution. In 2021, two out of three payments were made by payment card. But since Danmarks Nationalbank's 2019 survey,² physical card payments have declined, driven by a surge in mobile payments, see chart 1, right.

With the rise in mobile payments in physical trade, mobile payments accounted for 22 per cent of total payments in 2021, and the proportion of mobile payments has more than doubled in just two years.

Danmarks Nationalbank's survey of the payment behaviour of Danish households

Box 1

Danmarks Nationalbank has conducted its third survey of the payment behaviour of Danish households. The survey was performed by Kantar Gallup during the period from 16 August to 17 September 2021 and is based on responses from a representative selection of 1,712 Danes aged 15-79 years.¹

Respondents entered all their payments for an entire day in a payment diary. For each payment, the respondent stated several details, including the type of payment, e.g. mobile payment. The aggregated results are based on the survey.

In addition to the payment diary, each respondent answered a number of questions regarding their payment preferences, e.g. their preferred payment solution in physical trade.

The survey is associated with a statistical uncertainty of +/- 2 percentage points for questions covering the entire group of respondents. The uncertainty is greater when the survey is broken down into age groups and sub-questions, where the number of responses is lower.

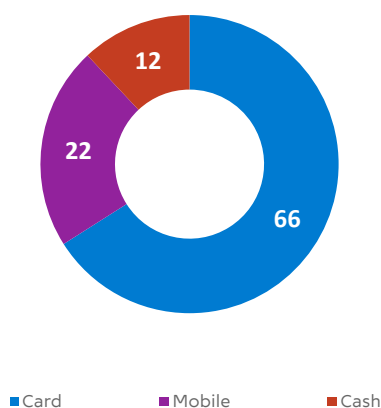
1. Danmarks Nationalbank previously conducted surveys of the payment behaviour of Danish households in 2017 and 2019.

Most payments in physical trade are digital

Chart 1

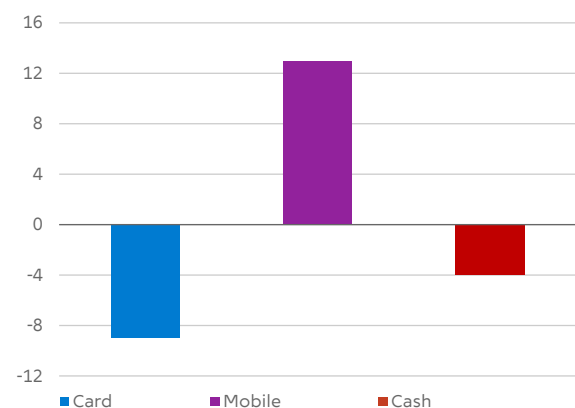
88 per cent of payments in physical trade are digital

Per cent



Mobile payments have surged since 2019

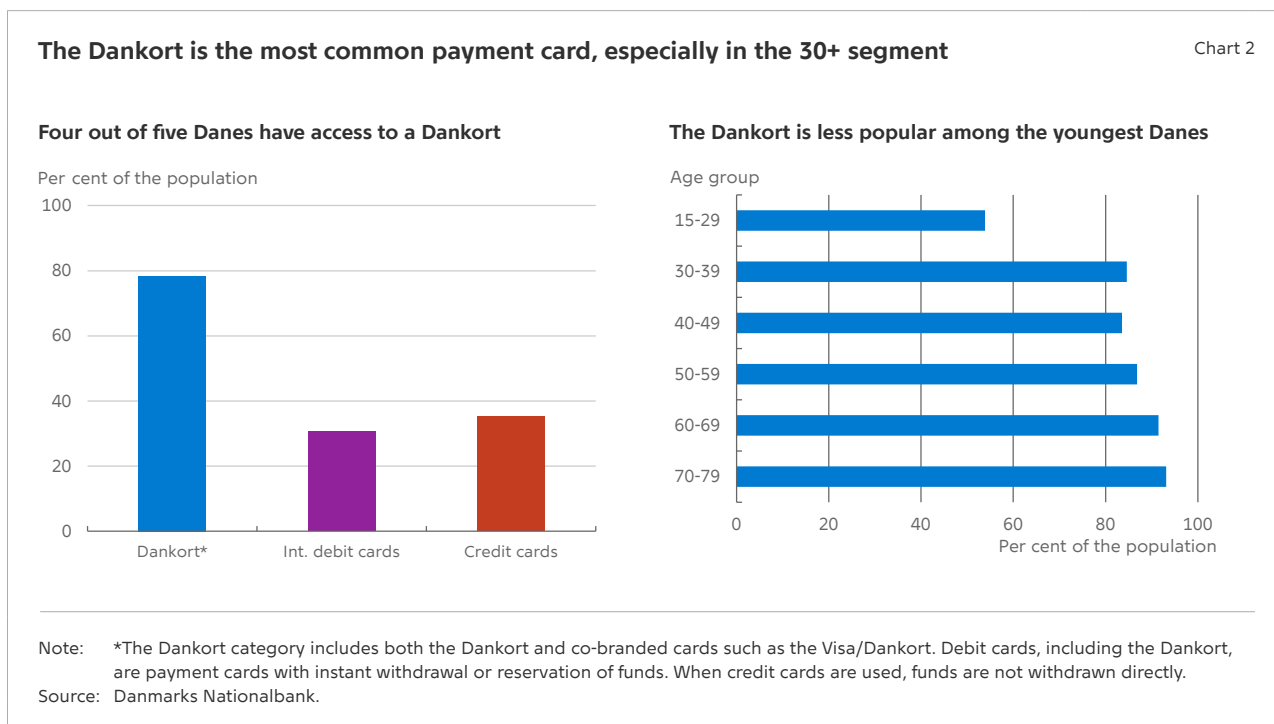
Change relative to 2019, percentage points



Note: Digital payment solutions include card and mobile payments. Mobile payments are calculated based on a consumer perspective, see box 2. The right-hand chart illustrates the distribution of payment solutions from 2019 to 2021. Details may not add because of rounding.
 Source: Danmarks Nationalbank.

1 In the analysis, physical trade includes all physical points of sale, services in a bank or at the post office and self-service environments such as a ticket vending machine at a railway station.

2 See Danmarks Nationalbank, J. Heisel and S. Pedersen, Danes primarily opt for electronic payment solutions, *Danmarks Nationalbank Analysis*, no. 15, September 2020 ([link](#)).



Overall, mobile payments have replaced cash as the second-most widely used payment solution in physical trade after payment cards.

Danmarks Nationalbank's survey indicates that about 2.1 billion transactions were made in physical trade in 2021 at a total value of around kr. 484 billion, see table annex. So, the number of transactions is in line with 2019, while the value of transactions in physical trade has grown by approximately kr. 17 billion.

Danes have access to several types of payment cards

Digital payment solutions are very popular in Denmark.³ The average Dane has access to 1.5 payment cards. The Visa/Dankort, included in Dankort category below, is the most popular card, see chart 2, left.

The prevalence of card types varies across age groups. The Dankort is less popular with the youngest Danes, in particular. Only 50 per cent of the 15-29-year olds are Dankort holders. For the rest of the population, this applies, on average, to just under nine out of ten, see chart 2, right.

On the other hand, more than half of the under 30s have access to an international debit card.⁴ In the 60+ segment of the population, this applies to only one in five. The popularity and prevalence of international debit cards among the younger population could be explained by the rules on payment card issuance: International debit cards may be issued to consumers as young as 7 years old, while the Dankort is typically issued only to individuals older than 18. This means that the first payment card to be issued to most Danes is an international debit card.

Credit cards are especially popular among Danes over the age of 60. Half of this age group has access to a credit card, while this applies to just one in five of the under 30s.

Four out of ten consumers have access to at least two mobile payment solutions

Mobile payment solutions are popular in Denmark. 94 per cent of the population has at least one mobile payment solution on their mobile phones, and 42 per cent of the population has access to at least two mobile payment solutions, see chart 3.

3 Since 2016, it has been a statutory requirement that all Danish consumers may have a payment card issued. In 2021, 99.7 per cent of Danes had access to at least one payment card.

4 Debit cards are payment cards with instant withdrawal or reservation of funds. When credit cards are used, funds are withdrawn at a later date.

The prevalence is due mainly to MobilePay: No less than 92 per cent of the population has access to the payment solution, see table 1. This means that virtually all smartphone users have one or more mobile payment solutions installed on their mobile phones.⁵

Since Danmarks Nationalbank's survey of the payment behaviour of Danish households in 2019, the popularity and prevalence of mobile payment solutions have grown considerably, driven, for instance, by the launch of new solutions such as Apple Pay and Google Pay in recent years, see box 2. Unlike MobilePay, these solutions can be used only in physical trade or online. In 2021, 18 per cent of consumers had Apple Pay installed on their phones, while 13 per cent and 9 per cent of consumers had access to the Dankort app and Google Pay, respectively.⁶

Recent mobile payment solutions are based on digital storage of existing payment cards in 'wallets'. In other words, although a mobile phone is used, the underlying payment is made as a card payment.

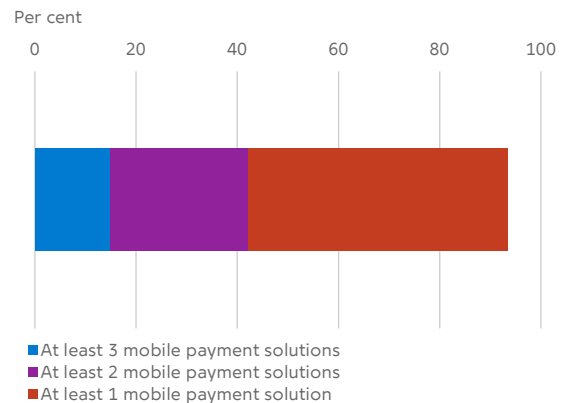
Mobile payments are especially popular among younger age groups

Danes have embraced mobile payments, which are used frequently across all age groups. The use of mobile payments in physical trade has more than doubled since 2019, see chart 4, and is especially popular among the under 40s.

In 2021, 37 per cent of their payments were mobile payments. As a result, the average younger consumer uses mobile payments for more than twice as many of their payments as the rest of the population. Last year, Danes over the age of 60 used mobile payments for one out of 12 payments in physical trade.

Mobile payment solutions are popular with Danes

Chart 3



Note: Mobile payment solutions include Apple Pay, the Dankort app, Google Pay, MobilePay, supermarket apps and other mobile payments solutions such as PayPal.

Source: Danmarks Nationalbank.

Proportion of the population having access to mobile payment solutions

Table 1

Mobile payment solution (per cent)	2019	2021
MobilePay	90	92
Apple Pay	9	18
Dankort-app	13	13
Google Pay	4	9

Note: Unlike the other solutions, MobilePay can also be used for person-to-person payments.

Source: Danmarks Nationalbank.

⁵ See *It-anvendelse i befolkningen 2020* (in Danish only), Statistics Denmark, November 2020 ([link](#)).

⁶ In Danmarks Nationalbank's 2019 survey, Apple Pay and Google Pay had limited prevalence in Denmark. One reason is that these payment solutions were available for later versions of smartphones only; another was that several banks had not yet rolled out Apple Pay for their customers.

Mobile payment solutions in the Danish payment market Box 2

In Denmark, mobile person-to-person payments were enabled with the launch of MobilePay in 2013. Subsequently, MobilePay launched solutions for both physical trade and e-commerce payments, and MobilePay now has more than 4.3 million users in Denmark. MobilePay primarily relies on the instant payment infrastructure for person-to-person payments and in physical trade, while the card infrastructure is used for online payments.

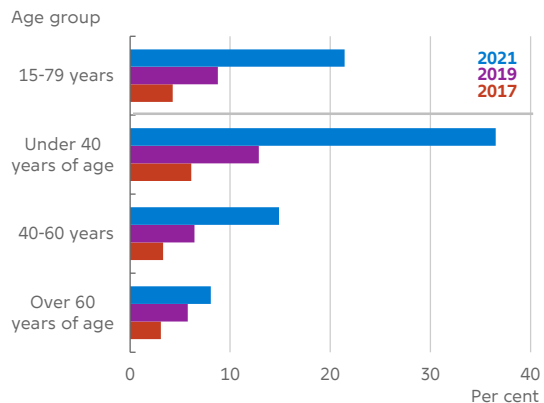
Since 2017, several mobile payment solutions have been launched in Denmark, starting with the Dankort app and Apple Pay in 2017 and followed by Google Pay in 2018. The Dankort app and MobilePay are both compatible with Apple and Android phones and are based on Bluetooth technology. To pay using these solutions, the consumer needs to open a separate app to complete the payment. Apple Pay and Google Pay are based on the built-in NFC chip¹, which is also used in Danish payment cards. NFC enables contactless Apple Pay and Google Pay payments on existing payment terminals. Hence, these solutions use the payment card infrastructure.

In addition to the payment solutions referred to above, the so-called supermarket apps have also become more popular in Denmark, for instance the Coop app and Netto+. Supermarket apps are essentially based on consumers' existing payment cards, which are stored digitally in an app for payments in a specific supermarket.

This analysis builds on responses from consumers, based on a consumer perspective, which makes it independent of the underlying technology. Therefore, all payments for which consumers have used their mobile phones are recorded as mobile payments. This also applies when the underlying infrastructure is a payment card, for instance an Apple Pay payment.

¹ Near Field Communication chip.

One in five payments in physical trade is a mobile payment Chart 4



Note: Mobile payments as a proportion of total payments in physical trade.
 Source: Danmarks Nationalbank.

Apple Pay is the most popular mobile payment solution in physical trade

According to Danmarks Nationalbank's survey, Apple Pay was the most popular mobile payment solution in Denmark in physical trade in 2021: 42 per cent of all mobile payments were made using Apple Pay, while MobilePay, the Dankort app and Google Pay accounted for 22 per cent, 19 per cent and 6 per cent, respectively, of total mobile payments.⁷

The survey shows that, in 2021, about 186 million transactions were made using Apple Pay in physical trade, see table annex, equivalent to an increase of 147 million transactions since 2019. This rise should be seen in the context that just 18 per cent of the population has access to the solution, see table 1. In other words, consumers who have activated Apple Pay on their phones are frequent users of this solution.⁸

The survey also shows that consumers using either Apple Pay or Google Pay use their mobile phones for more than half of all payments in physical trade.

⁷ Supermarket apps were used for most of the remaining payments.

⁸ Last year, two out of three payments made using Apple Pay were made by Danes under the age of 30. They were the most frequent users of this payment solution and also constituted the segment in which most people have access to this solution.

Danes prefer digital payments

Danmarks Nationalbank's survey also asked respondents about their payment preferences. In physical trade, six out of ten prefer paying by Dankort or Visa/ Dankort, citing, in particular, that the card is easy to use and is accepted everywhere. The preference for this card type applies across all age groups. However, consumers who pay by mobile phone emphasise that they always have their mobile phone at hand and that mobile payments are easy to use.

This means, the growing use of mobile payments appears to be driven by the accessibility and user-friendliness of these solutions. For instance, Apple Pay is the only solution capable of using the contactless NFC feature of the iPhone. Other solutions in physical trade tend to require several user interactions to complete the payment. Moreover, a MobilePay payment, for instance, requires the individual store to enter into a separate agreement with the company, while Apple Pay and Google Pay payments may be completed on existing payment terminals.

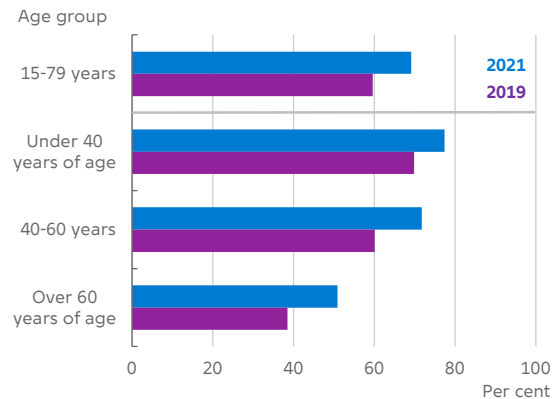
The coronavirus pandemic also seems to have impacted the payment preferences of Danes: Three out of ten respondents answered that the pandemic has caused them to use both payment cards and mobile phones for payments more often. In other words, the coronavirus pandemic appears to have induced more consumers to adopt digital payment solutions.

Vast majority of person-to-person payments are instant payments

In Denmark, more than three out of four person-to-person payments are digital. As opposed to their payment method in physical trade, private individuals mainly use their mobile phones for payments: Seven out of ten person-to-person payments are mobile payments, see chart 5.

Seven out of ten person-to-person payments are mobile payments

Chart 5



Note: The remaining payments were primarily cash or credit transfers.

Source: Danmarks Nationalbank.

Instant payments in Denmark

Box 3

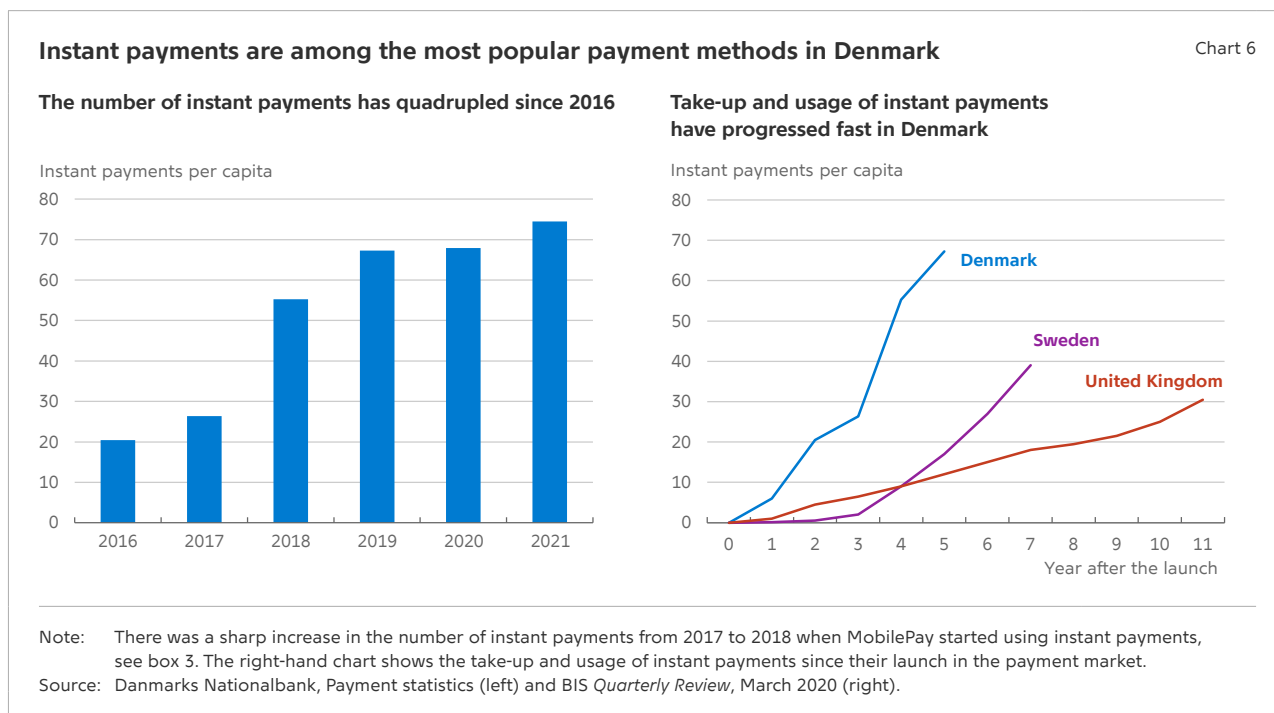
Instant payments were introduced in Denmark in November 2014. Instant payments are executed in the automated clearing house in which funds can be transferred instantly from payer to payee. The *Straksclearing* instant payment solution is owned by Finance Denmark and was established in partnership with Danmarks Nationalbank.

There was a sharp increase in the number of instant payments from 2017 to 2018 when MobilePay started using instant payments rather than card payments for the settlement of payments.¹

In Denmark, the maximum amount limit for instant payments is kr. 500,000. According to Finance Denmark, the value of 99 per cent of all instant payments is below kr. 10,000.²

Danmarks Nationalbank is cooperating with the European Central Bank, ECB, and the Swedish central bank, Sveriges Riksbank, to enable effective multi-currency cross-border instant payments in the EU.³

1. See Danmarks Nationalbank, Payment app tech triggers drop in Danish e-commerce, *Danmarks Nationalbank Statistics*, June 2018 ([link](#)).
2. See Finance Denmark, *Betalinger på et sekund er et hit* (in Danish only) ([link](#)).
3. See Danmarks Nationalbank, *Central bank cooperation and instant payments* ([link](#)).



Developments since 2019 show that mobile payments have become the preferred payment solution for person-to-person payments across all age groups and payment situations. According to the survey, MobilePay is the most popular solution for person-to-person payments, for instance for the purchase of goods from others and for bill sharing transactions after restaurant visits and the like. Danmarks Nationalbank's survey shows that last year about 250 million MobilePay person-to-person payments were made at a total value of approximately kr. 63 billion.

When private individuals use MobilePay for person-to-person payments, the underlying payment is an instant payment in which funds are transferred from the payer's account to the payee's account within seconds, see box 3. In other words, the popularity of MobilePay for person-to-person payments has been a key element in making instant payments one of the most prevalent payment methods in Denmark, used for two out of three person-to-person payments.

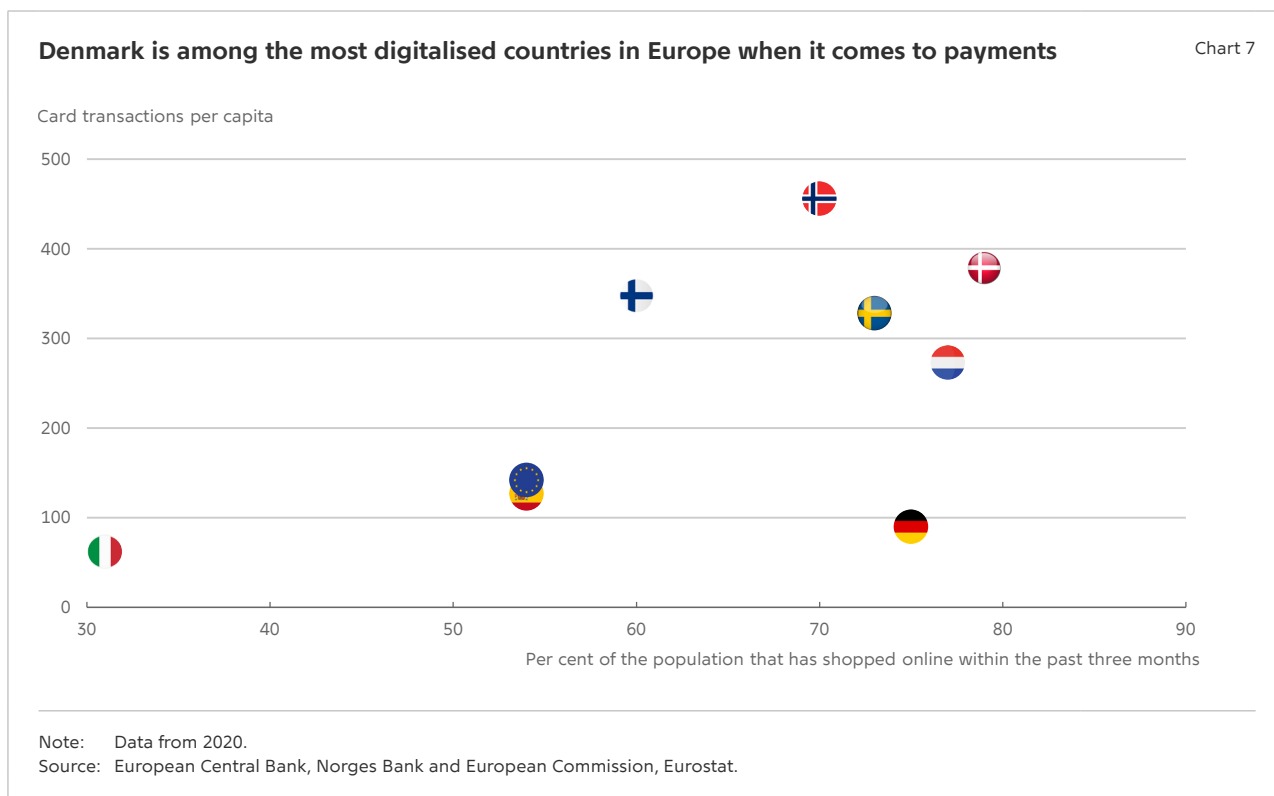
Take-up and usage of instant payments have progressed fast

In 2021, about 436 million instant payments were made in Denmark, almost a quadrupling since 2016, see chart 6, left. Overall, instant payments accounted for almost half of all credit transfers made in 2021.

According to figures from the Bank for International Settlements, BIS, take-up and usage of instant payments have progressed faster in Denmark than in other countries in the world.⁹ One reason is that mobile payments are commonplace for person-to-person payments in Denmark – another is that MobilePay, the most popular person-to-person payment solution, uses the Straksclearing system for the settlement of most of the transactions. Therefore, the take-up and usage of instant payments for person-to-person payments in Denmark have been factors in the higher adoption rate, measured in terms of the number of instant payments per capita, in Denmark than in other countries, see chart 6, right.¹⁰

9 Bank for International Settlements – *Quarterly Review*, March 2020 ([link](#)).

10 The average transaction value of instant payments in Denmark is low relative to other countries because in other countries instant payments are used relatively more by businesses, typically having less-frequent, higher-value payments than private individuals.



Denmark is among the most digitalised countries when it comes to payments

In addition to Danmarks Nationalbank's survey, a number of international studies show that Denmark is among the most digitalised countries when it comes to payments.

The latest statement from the European Commission, concludes that 79 per cent of Danes have shopped online in the past three months, making Denmark the EU member state with the highest proportion of online shoppers.¹¹

Denmark is also among the countries with the highest number of card transactions per capita. On average, each Danish consumer made more than 379 card transactions in 2020, equivalent to more than one card payment per day.

By way of comparison, 54 per cent of EU citizens shop online and made 142 card payments per year on average, see chart 7. In other words, Denmark stands out from most other European countries which still rely extensively on cash for payments – especially in the older segments of the population.¹² Therefore, the digital behaviour of senior citizens in Denmark is a key element in making Denmark one of the most digitalised countries when it comes to payments – both compared with Europe and with the rest of the world.

Digitalisation is broadly anchored in the population

The broad use of digital payment solutions in Denmark should be seen in the context of the broad anchoring of digitalisation in the population, reflected, for instance, in Danes' general internet usage.

11 See European Commission, *Eurostat* ([link](#)).

12 See European Central Bank, *Study on the payment attitudes of consumers in the euro area (SPACE)*, December 2020 ([link](#)).

Compared with the rest of Europe, internet usage is particularly high in the 65+ segment. In the latest cross-country survey from 2020,¹³ 94 per cent of Danes over the age of 65 responded that they had used the internet within the past three months. The corresponding proportion across the EU was 61 per cent, see chart 8.

One reason for the high usage of the internet in Denmark may be extensive public-sector digitalisation, making internet usage key in the interaction with public authorities, see box 4. In 2020, 92 per cent of Danes used the internet to access public services, the highest proportion among the EU member states.¹⁴

The factors of widespread internet usage, a high degree of public-sector digitalisation and Danes' digital payment behaviour in combination interact to increase digitalisation even more.

E-commerce accounts for a growing proportion of total Danish card turnover

As more Danes embrace digitalisation, a greater proportion of consumption and payments also move online. Last year, e-commerce accounted for about one third of total card turnover in Denmark. This proportion has been growing since 2016 when Danmarks Nationalbank started publishing statistics in this field.

According to Danmarks Nationalbank's latest survey, 46 per cent of online payments in 2021 were mobile payments, most of which were made using Mobile-Pay. One reason was the use of in-app mobile purchases – 'in-app payments'.¹⁵

Last year, approximately 48 million in-app payments were made, an increase of 15 million payments since 2019. As a result, in-app payments accounted for about 42 per cent of total online mobile payments in 2021. In-app payments are primarily used to pay for, for instance, train or bus fare.

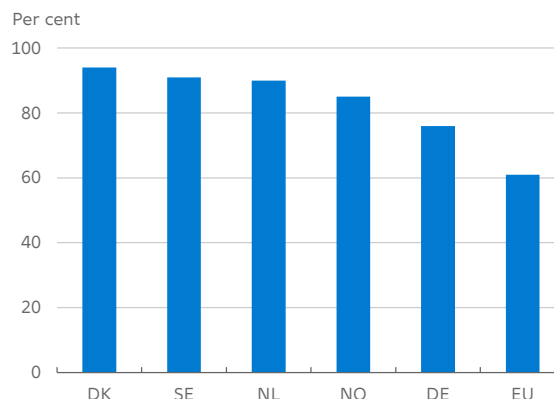
13 See European Commission, *Eurostat* ([link](#)).

14 See European Commission, *Digital Economy and Society Index 2021* ([link](#)).

15 In-app payments are in-app mobile purchases, for instance to pay for train or bus fare or for gaming app purchases.

Danes over the age of 65 are frequent Internet users

Chart 8



Note: Data from 2020 when respondents were asked whether they had used the internet within the past three months.
 Source: European Commission, Eurostat.

Digital public services in Denmark

Box 4

Today, most public services are available digitally. Examples include *borger.dk* and *skat.dk* from which Danes can access public services and information.

Key elements in enabling digital access to public services are the prevalence of the personal digital IDs *NemID* and *MitID*, the digital mailbox *e-Boks* and a statutory requirement for all Danes above 18 to hold a payment account, *NemKonto*, for payments from the public sector. Payments from public authorities such as state pension or tax refunds are digital only.¹

Since 2014, all Danes above the age of 15 have, in principle, been required by law to receive Digital Post from public authorities and communicate digitally with public authorities.² A case in point is tax statements, which Danes are required to check digitally. Mandatory digital communications have, for instance, accelerated the need for internet access across the population. In 2020, public authorities sent 161.5 million digital letters to citizens.

Recently, the Agency for Digitisation launched digital driving licences and health cards to enable storage of these on mobile phones. Due to public digital innovations, Danes are now able to digitally store their payment and identification cards in one place.

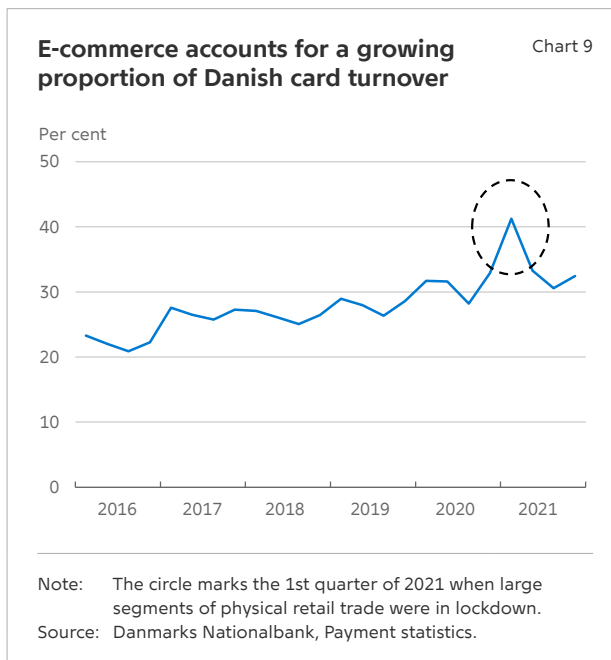
1. The Danish Public Payments Act (Lov om offentlige betalinger).
 2. The Danish Public Digital Post Act (Lov om Digital Post fra offentlige afsendere).

The coronavirus pandemic has impacted e-commerce

The coronavirus pandemic has accelerated digital payments, both in physical trade and online. One reason for the rising use of online payments was that most physical retail stores were locked down due to the pandemic in the 1st quarter of 2021. As a result of the lockdown, a relatively high proportion of total card turnover was made online, see chart 9, as total card turnover was reduced due to the lockdown and part of the remaining consumption moved online from physical trade.

With the gradual reopening of society, the e-commerce proportion of total card turnover fell back to a level in line with the upward trend characterising developments since 2016. The lockdown seems to have resulted in a sudden and temporary spike in e-commerce relative to physical trade.

The coronavirus pandemic may also have caused new consumers to embrace e-commerce, which has contributed to maintaining the upward trend. This is supported by Danmarks Nationalbank's survey, which shows that Danes over the age of 60 accounted for a higher proportion of total online payments relative to the pre-pandemic period. In 2021, one in four online payments was made by Danes over the age of 60 compared with one in five payments in 2019. In other words, it seems likely that the pandemic has caused a larger group to shop online, increasing the total proportion of consumers who shop digitally.¹⁶



¹⁶ See Statistics Denmark, 75,000 nye e-handlende ældre på to år (in Danish only), *News from Statistics Denmark*, no. 276, July 2021 ([link](#)).

Table annex – digital payments

Payments in physical trade broken down by type, 2021

Table A1

	Number (million transactions)	Value (kr. billion)
Total payments	2,065	483.7
Total card payments	1,363	348.8
<i>Dankort and Visa/Dankort</i>	1,078	270.3
<i>International debit cards</i>	180	46.2
<i>International credit cards</i>	104	32.3
Total mobile payments	445	92.0
<i>MobilePay</i>	100	31.1
<i>Apple Pay</i>	186	32.7
<i>Google Pay</i>	27	3.5
<i>Dankort app</i>	83	15.6
<i>Other mobile payments</i>	50	9.2
Total cash payments	257	42.9

Note: The survey is based on responses from a representative selection of 1,712 citizens aged 15-79 years. The survey is associated with a statistical uncertainty of +/- 2 percentage points for questions covering the entire group of respondents. The uncertainty is greater when the survey is broken down into age groups and sub-questions, where the number of responses is lower. The aggregated results are based on the household survey, see box 1. Physical trade includes all physical points of sale and self-service environments such as a ticket vending machine at a railway station. Details may not add because of rounding.

Source: Danmarks Nationalbank.

Proportion of the total number of payments broken down by payment type and age, 2021

Table A2

Per cent	15-29 years	30-39 years	40-49 years	50-59 years	60-69 years	70-79 years	15-79 years
Card payments	54	55	70	71	80	72	66
Mobile payments	40	30	18	12	8	9	22
Cash payments	6	15	12	17	13	19	12

Note: The survey is based on responses from a representative selection of 1,712 citizens aged 15-79 years. The survey is associated with a statistical uncertainty of +/- 2 percentage points for questions covering the entire group of respondents. The uncertainty is greater when the survey is broken down into age groups and sub-questions, where the number of responses is lower. The aggregated results are based on the household survey, see box 1. Physical trade includes all physical points of sale and self-service environments such as a ticket vending machine at a railway station. Details may not add because of rounding.

Source: Danmarks Nationalbank.

PUBLICATIONS



NEWS

News offers quick and accessible insight into an Analysis, an Economic Memo, a Working Paper or a Report from Danmarks Nationalbank. News is published continuously.



ANALYSIS

Analyses from Danmarks Nationalbank focus on economic and financial matters. Some Analyses are published at regular intervals, e.g. *Outlook for the Danish economy* and *Financial stability*. Other Analyses are published continuously.



REPORT

Reports comprise recurring reports and reviews of the functioning of Danmarks Nationalbank and include, for instance, the *Annual report* and the annual publication *Danish government borrowing and debt*.



ECONOMIC MEMO

An Economic Memo is a cross between an Analysis and a Working Paper and often shows the ongoing study of the authors. The publication series is primarily aimed at professionals. Economic Memos are published continuously.



WORKING PAPER

Working Papers present research projects by economists in Danmarks Nationalbank and their associates. The series is primarily targeted at professionals and people with an interest in academia. Working Papers are published continuously.

The analysis consists of a Danish and an English version. In case of doubt regarding the correctness of the translation the Danish version is considered to be binding.

DANMARKS NATIONALBANK
LANGELINIE ALLÉ 47
DK-2100 COPENHAGEN Ø
WWW.NATIONALBANKEN.DK

This edition closed for
contributions on 1 February 2022



**DANMARKS
NATIONALBANK**

Jakob Mølgaard Heisel
Senior Retail
Payments Economist
jmhe@nationalbanken.dk

Marcus Clausen Brock
Research Assistant
mcb@nationalbanken.dk

FINANCIAL STABILITY

CONTACT

Ole Mikkelsen
Communications
and Press Officer

omi@nationalbanken.dk
+45 3363 6027

SECRETARIAT
AND COMMUNICATIONS