



RESEARCH & ANALYSIS

Developments in Noncash Payments for 2019 and 2020: Findings from the Federal Reserve Payments Study

December 2021



The Federal Reserve Payments Study (FRPS) collects data to document trends and developments in U.S. payments. This brief is the first report since the detailed release of 2018 data. It provides new findings for 2019 and 2020, the latter year reflecting effects of the global COVID-19 pandemic, on payments processed over general-purpose credit and debit card networks, including non-prepaid and prepaid debit card networks; the automated clearinghouse (ACH) transfer system; and the check clearing system. These payment systems—card, ACH, and check—form the core of the noncash payment and settlement systems used to clear and settle everyday payments made by consumers and businesses in the United States today. Results include estimates of payment shares based on information collected from large depository institutions in the Depository and Financial Institutions Payments Survey (DFIPS). Results also include nationally representative totals for cards from the Networks, Processors, and Issuers Payments Surveys (NPIPS).

The global COVID-19 pandemic has had a broad impact on social and economic conditions in the United States and around the globe. The pandemic's effects also extended to U.S. payments systems as industries responded to changes in supply and demand and as various social distancing considerations affected payment behavior. For example, some consumers and businesses adopted new payment technologies or increased their use of remote payment options as a result of increased tendencies to work or shop from home.

Quarterly Data Were Collected for the First Time

As in the past, the surveys collected annual data, and the effects of the pandemic can be seen by comparing 2020 estimates with those for previous years, such as in the shares of cards, ACH, and checks at large depository institutions from the DFIPS or in volumes for cards from the NPIPS. To study how the use of payments changed as the pandemic affected people's lives and behaviors, the 2020 surveys also collected quarterly data. The quarterly data allow estimates of within-year changes in the adoption of new payment

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technologies, specifically digital-wallet-based card payments and bank-sponsored person-to-person (P2P) payments from the DFIPS and estimates of total in-person card payments (including contactless card payments) and remote card payments (including e-commerce) from the NPIPS.

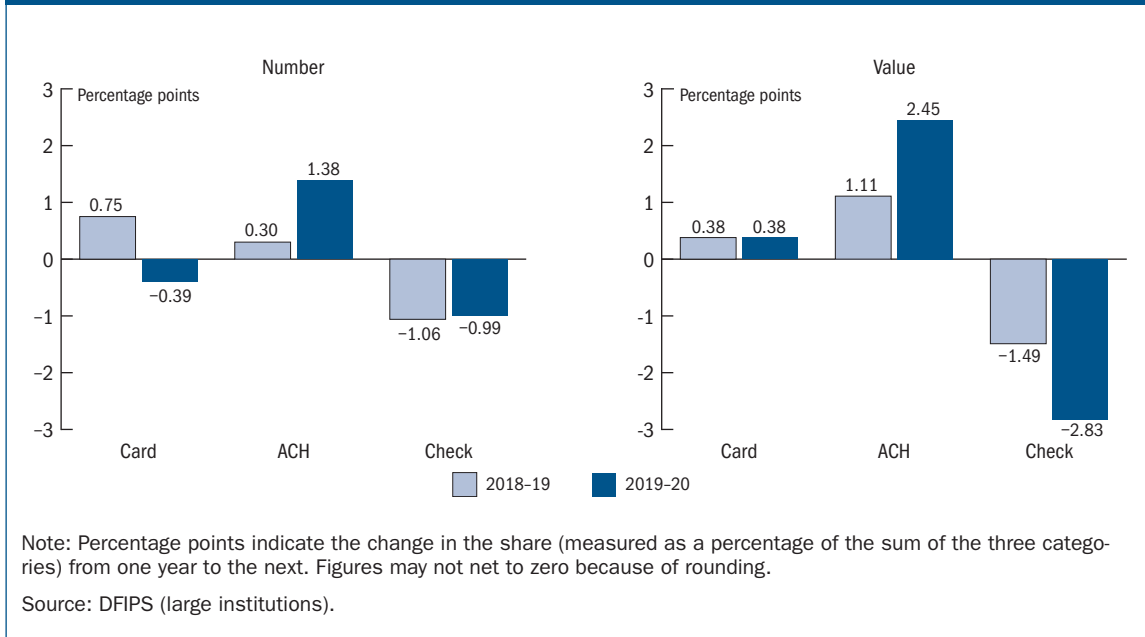
Key Findings

- While data from 2019 largely show a continuation of past payment trends, with card and ACH both gaining share at the expense of checks, payment behavior changed sharply in 2020 with the COVID-19 pandemic, with ACH gaining substantially as a share of noncash payments by both number and value.
- The share estimates combined with other information imply that ACH was the only one of the three core payment systems to grow by number in 2020.
- The total number of card payments declined in 2020, driven by a marked decline of in-person card payments. This is the first annual decline in the number of card payments recorded by the FRPS.
- As in-person card payments dropped in spring of 2020, remote card payments took up much of the slack; later in the year, in-person card payments recovered somewhat.
- The pandemic may have helped to spur growth of innovative payment methods, such as in-person contactless card, digital wallet, and P2P payments.
 - First-time use of bank-sponsored P2P payments spiked in the second quarter of 2020, a time of business closures and stay-at-home orders.
 - First-time use of digital wallets was highest in the third quarter, when some restrictions on in-person shopping were lifted. When used with a mobile device, a digital wallet provides a low-touch option for in-person card payments.

ACH Gained Share Over Card and Check

In recent years, the FRPS has collected data for a sample of the largest depository institutions by deposit size through annual surveys.¹ The annual DFIPS large institution samples supplement the more extensive representative samples of depository institutions collected every three years. For this brief, the large institution data were used to estimate changes in the shares of payments among card, ACH, and check for 2018 to 2019 and for 2019 to 2020 (figure 1). These estimates provide insight into changes in the composition of payments that have occurred since 2018, the

¹ While the payment volumes are dominated by those reported by large commercial banks, the samples of large depository institutions also include data from the largest savings institutions and credit unions.

Figure 1. Changes in the shares of noncash payments, 2018–19 and 2019–20

year for which the last nationally representative sample-based estimates for card, ACH, and check are available from the DFIPS.²

Estimates from the large depository institution data show that ACH was the only payment and settlement system among the three to grow in share by number in both the 2018 to 2019 and 2019 to 2020 periods. In fact, the share of ACH grew more by number and value from 2019 to 2020 (during the pandemic) than from 2018 to 2019 (before the pandemic). By contrast, the share of card by number grew a small amount from 2018 to 2019 and declined, though by a smaller amount, from 2019 to 2020, while the share of card by value grew by small and roughly equal amounts in the two periods. The share of checks by number fell roughly the same amount from 2018 to 2019 and 2019 to 2020, while the share of checks by value fell more in the latter period (during the pandemic) than in the former (before the pandemic).

The share estimates by themselves do not imply growth or decline in totals for the three core payment systems. The estimates combined with other information, however, imply that ACH was the only one of the three core payment systems to grow by number from 2019 to 2020. In particular, the 2019 to 2020 decline in the estimated share of cards by number is consistent with the concurrent decline in the total number of card payments from the NPIPS, as documented later in this brief. Similarly, the increase in the share of ACH by number from 2019 to 2020 is consistent with a concurrent increase in publicly available figures for ACH network volume. Finally, the steeper

² See the Federal Reserve Board's website for the *2019 Federal Reserve Payments Study, Detailed Data Release* (October 2020), available at <https://www.federalreserve.gov/paymentsystems/fr-payments-study.htm>.

decline in the share of checks relative to cards from 2019 to 2020 implies that the total number of checks also declined.

By Number, Card Payments Were the Most Used of Noncash Payments

	Number			Value		
	2018	2019	2020	2018	2019	2020
Total	100.00	100.00	100.00	100.00	100.00	100.00
Card	73.88	74.64	74.25	7.08	7.45	7.84
ACH	17.56	17.87	19.24	65.69	66.80	69.25
Check	8.55	7.50	6.51	27.23	25.74	22.91

Note: Figures may not sum because of rounding.
Source: DFIPS 2018 (all institutions); DFIPS 2019–20 (large institutions).

To examine the potential implications of these patterns for aggregate payment shares, the estimated share changes for large depository institutions over the 2018 to 2020 period can be applied to the shares associated with the previously published 2018 total estimates (table 1). After exhibiting the highest absolute growth in number of payments for more than a decade, as well as the highest growth rate, card payments have become the dominant type of noncash payments by number, accounting for 73.88 percent of all such pay-

ments in 2018. The value share of card payments, on the other hand, was 7.08 percent in 2018, reflecting the smaller average value of card payments compared with the other two payment systems.

From 2018 to 2020, growth in the shares for card payments was quite small by number and by value compared with past trends. The estimated share of card payments by number increased by just over one-third of a percentage point, reaching 74.25 percent in 2020. The share of card payments by value increased slightly more over the two years, rising by just over three-quarters of a percentage point to 7.84 percent in 2020.

Considering the time ranges separately, the share of card payments by number rose from 2018 to 2019 and then fell from 2019 to 2020, while card payments by value exhibited slow but steady growth in share in both periods. Changes in card shares, both increases and decreases, were quite small in both years. The decline in share by number from 2019 to 2020, 0.39 percentage point, is notable nevertheless because this was the first decline detected in card share by number since the first FRPS estimates for 2000.

ACH Shares Grow Rapidly

The shares of ACH transfers by both number and value grew from 2018 to 2019, and the growth in shares accelerated from 2019 to 2020. ACH has long dominated the core payment systems by value, but recent increases in the ACH share by number were unusually rapid.

The share of ACH transfers by value reached 69.25 percent in 2020, having grown 1.78 percentage points per year since 2018. That rise was similar to the rise in ACH share of 1.80 percentage points per year from 2015 to 2018. The rise in shares for ACH is consistent with the rise in ACH network volumes in data released by NACHA, which show that the number and value of payments on the ACH network, representing the majority of ACH payments, both grew substantially from 2018 to 2019 and from 2019 to 2020.³

By number, the share of ACH reached 19.24 percent in 2020, having grown 0.84 percentage point per year since 2018. Compared with practically no change from 2015 to 2018, when the share by number rose 0.01 percentage point per year, that rise was significantly larger. The rise of ACH share by number, most of which occurred from 2019 to 2020, is due partly to consumers and businesses making more ACH payments directly and partly to more use of ACH as a settlement vehicle for a variety of payment types of relatively small value (for example, through popular apps widely installed on smartphones). Initial analysis of ACH data collected separately indicates that, from 2019 to 2020, the already large numbers of traditional consumer ACH transfers (for example, bills) and business ACH transfers (for example, bills, direct deposit of paychecks, internal corporate transfers) increased at a faster rate than in previous years. Online and P2P payments settled via ACH also grew faster, while checks that were written and converted to ACH payments at the point of sale and in the back office at merchants stopped declining.

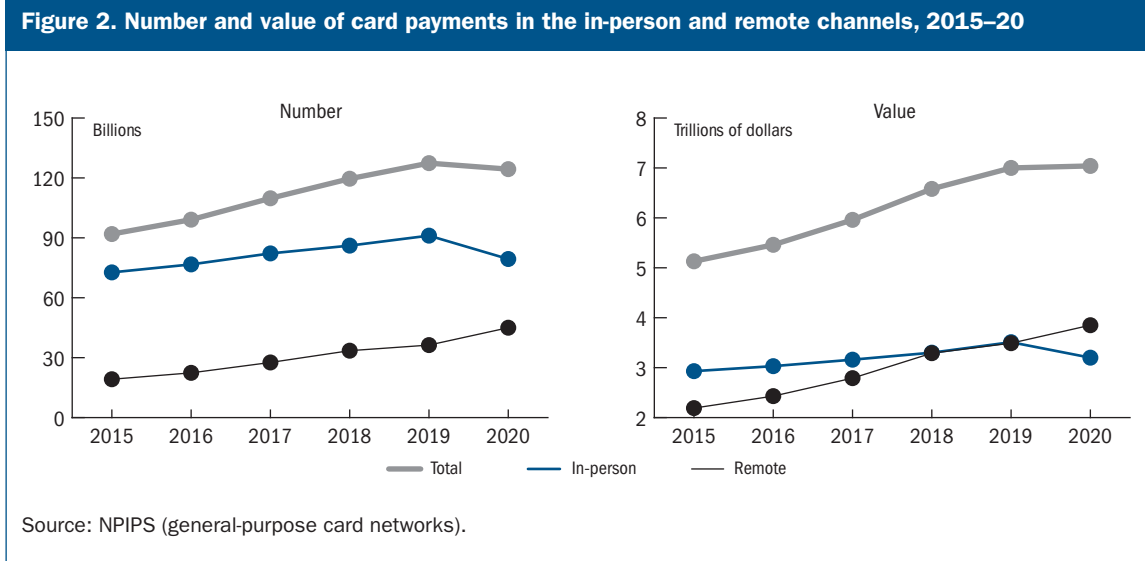
Federal government (U.S. Treasury) ACH transfers also increased substantially from 2019 to 2020.⁴ Increases in federal government ACH payments, which represent a small but significant fraction of total ACH payments, were partially driven by the distribution of Economic Impact Payments (or “stimulus payments”) by direct deposit. ACH payments originated by the U.S. Treasury increased by 10.20 percent by number and 18.7 percent by value from 2019 to 2020. These increases are substantially greater than in any year since 2008.

The Share of Checks Continued to Decline by Number and Value

The decline in the share of checks by value accelerated slightly over the two-year period compared with the past, but included a pronounced acceleration for 2020. The share of checks by value declined 1.49 percentage points from 2018 to 2019 and 2.83 percentage points from 2019 to 2020. On average, the decline in the share of checks by value continued at a slightly faster pace than previously, with a 2.16 percentage point decline per year from 2018 to 2020 compared with the 2.12 percentage point decline per year from 2015 to 2018.

³ NACHA, “ACH Network Sees Record Growth in 2020 to 26.8 Billion Payments,” news release, NACHA, February 4, 2021, <https://www.nacha.org/news/ach-network-sees-record-growth-2020-268-billion-payments> and “ACH Network Annual Growth Rate Reaches 12-Year High,” news release, NACHA, February 3, 2020, <https://www.nacha.org/news/ach-network-annual-growth-rate-reaches-12-year-high>.

⁴ For government and other Reserve Bank ACH processing data, see the Federal Reserve Board’s website at https://www.federalreserve.gov/paymentsystems/fedach_data.htm.



In contrast to the acceleration by value, the decline in the share of checks by number slowed slightly from 2018 to 2020, compared with previous years. The decline in the share of checks by number was 1.05 percentage points from 2018 to 2019 and 0.99 percentage point from 2019 to 2020. On average, checks declined 1.02 percentage points per year from 2018 to 2020 compared with an average decline of 1.54 percentage points from 2015 to 2018.

Although the decline in share by number from 2019 to 2020 was not unusual compared with the past, the total number of commercial checks processed by the Federal Reserve Banks, a minor fraction of total checks, declined 14.20 percent, substantially faster by number and value in 2020 compared with other recent years.⁵ Although a very small fraction of the total, and small compared to government ACH, the number and value of U.S. Treasury checks increased at the highest rates in decades from 2019 to 2020, rising 62.70 and 37.90 percent, respectively, partially driven by the distribution of Economic Impact Payments in 2020.

Growth in Card Payments Stalled in 2020

The Number of Card Payments Dropped in 2020, while Value Increased

Based on card data collected in the NPIPS, the total number of card payments increased 7.8 billion from 2018 to 2019, in line with growth trends from 2015 to 2018, and then declined 3.0 billion in 2020 (figure 2, table A.1). The decline from 2019 to 2020 is the first annual decline in the total number of card payments observed in FRPS estimates in two decades of collecting and

⁵ For Reserve Bank check processing data, including commercial and federal government processing, see the Federal Reserve Board's website at https://www.federalreserve.gov/paymentsystems/check_data.htm.

reporting these estimates.⁶ Despite the decline from 2019 to 2020, the total number of card payments was higher in 2020 than in 2018 (124.4 billion and 119.6 billion, respectively). In contrast, the total value of card payments increased not only from 2018 to 2019 but also from 2019 to 2020, continuing its recent upward trend. The average value of card payments correspondingly increased from 2019 to 2020, consistent with consumers bundling more goods or services into fewer payments as part of reducing in-person shopping trips.

In-Person Card Payments Exhibited Unprecedented Decline in 2020

Card payments can be divided into in-person card payments, for which the payer is physically present at the merchant location at the time of payment, and remote card payments, for which the payer is not. From 2018 to 2019, the number of in-person card payments increased 5.0 billion, in line with the growth trend from 2015 to 2018. The number of remote card payments increased 2.8 billion from 2018 to 2019, a smaller increase compared with other recent years. The arrival of the pandemic in 2020 did not just reverse this order: It ushered in an unprecedented shift from in-person to remote card payments. In particular, from 2019 to 2020, the number of in-person payments declined 11.7 billion. This drop was not only large in absolute and percentage terms but also represents the first one-year decline of in-person card payments seen in FRPS data. By contrast, the number of remote card payments increased 8.7 billion, the largest one-year increase in such payments seen in FRPS data.

Multiple factors potentially contributed to the simultaneous drop in in-person card payments and increase in remote card payments in the first year of the pandemic. Consumer and business card users responded to the sudden change in circumstances and quickly reduced their in-person purchases. At the same time, some payees changed their policies and practices for accepting payments, typically to minimize physical interactions and contact. Factors that affected the mix of in-person and remote card payments likely included stopping certain in-person purchases—such as public transportation, gasoline purchases, travel, theater, or dining—and shifting to purchases of remote substitutes, such as computer hardware and software, home improvements, office equipment, streaming services, or food delivery. In some cases, such as for grocery shopping, traditional brick-and-mortar merchants ramped up e-commerce shopping capabilities combined with delivery and curbside pickup services.⁷

Driven by the substantial and unprecedented shift from the in-person to the remote channel from 2019 to 2020, the value of remote card payments exceeded the value of in-person card payments for the first time in 2020. As reported in previous FRPS releases, the value of remote card pay-

⁶ Data were not collected on an annual basis before 2015. It is possible that cards could have declined for interim years between triennial FRPS data collections, such as the period of financial crisis between 2006 and 2009.

⁷ In general, payments for such services are classified as remote, even though there may be an in-person aspect to the transaction.

ments had converged on and nearly equaled the value of in-person payments in 2018. That relationship was repeated in 2019.

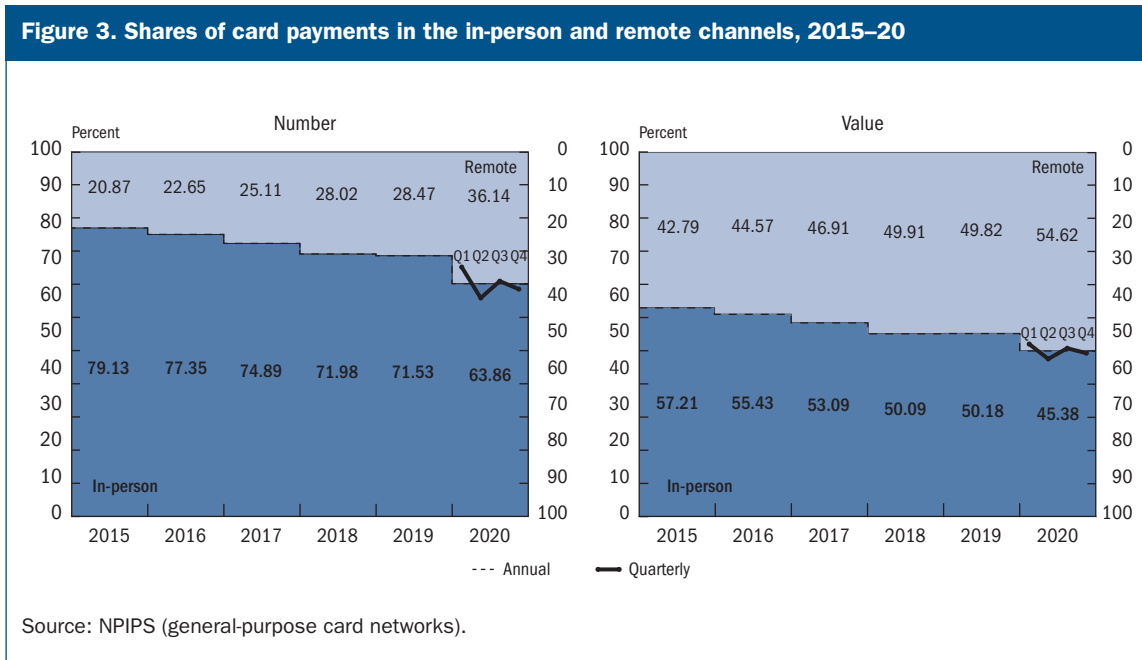
In 2020, however, the value of remote card payments not only exceeded that of in-person card payments but also did so by a significant amount, reaching \$3.85 trillion in 2020, compared to \$3.20 trillion for in-person card payments. Indeed, the value of remote card payments in 2020 exceeded the value of in-person card payments at their all-time peak of \$3.51 trillion in 2019.

The average value of remote card payments, which remained substantially larger than that of in-person card payments, fell from \$96 in 2019 to \$86 in 2020. The \$10 decline in the average value of remote card payments from 2019 to 2020 was larger than the decline in any one-year period since 2015 and implies a growing proportion of smaller-value remote card payments. For 2019 to 2020, the \$10 decrease in the average value of remote card payments was equivalent to combining the 2019 payment distribution with an additional 8.7 billion new payments with an average value of \$41, only \$1 more than the average value of in-person payments, which grew to \$40 in 2020. Viewed this way, the pattern of remote card payments growth from 2019 to 2020 differs from that observed from 2015 to 2019, when the average value of new remote card payments, by the same reasoning, would have equaled \$70 or more for all years. Together, these facts suggest that the massive shift to remote payments in 2020 was driven at least in part by consumers purchasing lower-cost, everyday items via the remote channel that they would have otherwise bought in person.

The shifts from the in-person channel to the remote channel can also be summarized in terms of shares ([figure 3](#)). From 2015 to 2018, there was a steady increase by both number and value in the share of card payments made remotely, while from 2018 to 2019, the shares changed little. Then, from 2019 to 2020, the share of remote card payments by number increased markedly, rising from 28.47 percent in 2019 to 36.14 percent in 2020, an increase of 7.67 percentage points and the first time the share of remote card payments exceeded one-third of all card payments. Meanwhile, the share of remote card payments by value grew from 49.82 percent in 2019 to 54.62 percent in 2020, an increase of 4.80 percentage points. The increases in shares of remote card payments by number and value from 2019 to 2020 were substantially larger than the highest increases in recent years. From 2017 to 2018, for example, the shares of remote card payments rose 2.91 percentage points by number and 3.00 percentage points by value.

Quarterly Data Show Greatest Shift to Remote Card Payments in the Second Quarter of 2020

New quarterly data provide additional insight into how shifts between in-person and remote card payments occurred during 2020 ([figure 3](#)). In the first quarter of 2020, the shares of in-person and remote card payments by both number and value were similar to those observed in 2018 and



2019. The data show that the greatest adjustment occurred soon after the pandemic took hold in the second quarter of 2020, by which time the consequences of the pandemic and responses to it were fully visible.⁸

As social-distancing protocols loosened during the summer, consumers and businesses adjusted, with some businesses reopening. Simultaneously, the split between in-person and remote card payments in the third quarter of 2020 shifted back toward that observed in the first quarter. Finally, in the fourth quarter, as the flu season, concerns about the pandemic’s resurgence, and the holiday shopping season kicked in, card payments swung back toward a higher share of remote payments.

Swings in the split between in-person and remote card payments throughout 2020 were more pronounced in the shares by number than by value. Starting at less than one-third of card payments in the first quarter (31.58 percent), remote payments by number shot up to 40.08 percent in the second quarter, before dropping to 35.46 in the third quarter, and finally rising again to 37.65 percent in the fourth quarter. By value, the shares of in-person and remote card payments moved in the same direction as the shares by number but exhibited milder variation throughout 2020, rising from 52.71 percent in the first quarter to a peak of 56.79 percent in the second quarter, dropping

⁸ Various events throughout March 2020 foreshadowed the economic impact that was to come, such as the World Health Organization escalation of the COVID-19 outbreak to pandemic status, major U.S. sports league cancellations, announcements of school closures, and federal government emergency responses. For a time line and discussion of data on the early economic impacts see, for example, Jane Ihrig, Gretchen Weinbach, and Scott A. Wolla, “COVID-19’s Effects on the Economy and the Fed’s Response,” Page One Economics, Federal Reserve Bank of St. Louis, September 2020, <https://research.stlouisfed.org/publications/page1-econ/2020/08/10/covid-19s-effects-on-the-economy-and-the-feds-response>.

to 53.86 percent in the third quarter, and finally rising again to 55.21 percent in the fourth quarter.

A 2020 Surge in E-commerce Drove an Increase in the Share of Remote Card Payments

The FRPS categorizes remote card payments into mail order/telephone order (MOTO), e-commerce (internet purchases), recurring/installment (for example, regular bill payments and subscriptions to media services), and “other” (which includes payments that could not be assigned to any of the other categories). From 2018 to 2020, by both number and value, the categories of e-commerce and recurring/installment payments grew, while the categories of MOTO and “other” declined. A surge in e-commerce was a key contributor to the growth in remote card payments from 2019 to 2020, having increased 7.2 billion by number and \$0.37 trillion by value over the period. As a result, in 2020, e-commerce comprised more than two-thirds (67.67 percent) of remote card payments by number and 59.16 percent by value, compared with 63.96 percent and 54.78 percent, respectively, in 2019.

2020 Saw Continued Adoption of New Ways to Make Payments

Adoption of new payment technologies can be viewed not only in terms of more frequent payments by current users (i.e., intensity of use) but also in terms of payers using them for the first time (i.e., first-time use). The analysis below looks at the intensity of use of contactless card payments and at both intensity of use and first-time use for digital wallet and P2P payments. The data suggest that the pandemic spurred growth of these innovative payment methods.

Despite Recent Growth, Contactless Card Payments Were Rare

A contactless card payment involves the initiation of an in-person transaction through a tap or wave of a card with a special microchip or a mobile device at a merchant terminal or kiosk.⁹ The FRPS has measured contactless card payments since 2018 through the NPIPS. Contactless card payments could be perceived to reduce virus transfer risks by reducing the amount of time spent handling payments and touching surfaces at checkout.

The data show that contactless card payments by number more than doubled from 2018 to 2019, rising from 0.7 billion in 2018 to 1.6 billion in 2019, for a rate of increase of 121.24 percent ([table A.1](#), appendix). In the face of declines in in-person card payments overall in 2020, contact-

⁹ The proportions of mobile devices or contactless cards used were not measured. The remainder of chip payments, called contact payments, require the insertion of a card into the terminal. Both contactless and contact chip payments may use the Europay, MasterCard and Visa (EMV) microchip-based specification.

less card payments grew more rapidly, increasing at a rate of 172.30 percent since 2019 to reach 3.7 billion in 2020.

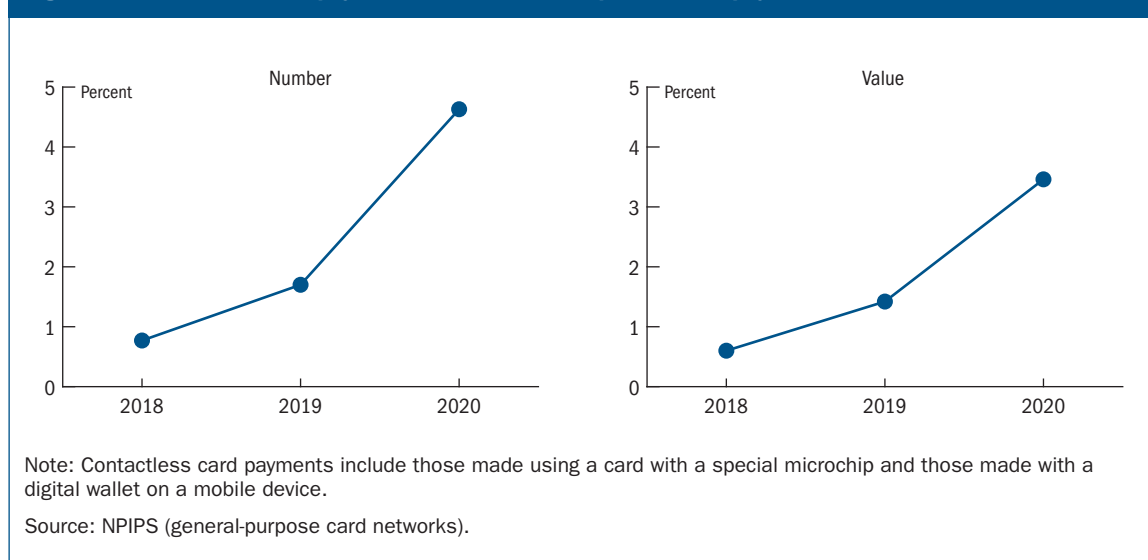
By value, contactless card payments increased from \$0.02 trillion in 2018 to \$0.05 trillion in 2019, before increasing to \$0.11 trillion in 2020. Contactless card payments tended to be for smaller-value purchases compared to other in-person payments, with an average value of \$30 compared with an average value of \$40 for in-person card payments in 2020.

Faster increases in contactless payments may indicate a pandemic effect. As a share of the number of in-person payments, the number of contactless card payments reached 4.63 percent in 2020, up from 1.70 percent in 2019 and just 0.77 percent in 2018 (figure 4). As a share of the value of in-person card payments, contactless card payments increased from 0.60 percent in 2018 to 1.42 percent in 2019 and 3.40 percent in 2020.¹⁰

Digital Wallet Card Payments Grew Quickly from a Small Base

Digital wallets allow the secure storage of card credentials and shipping information on a mobile device or online. The technology allows in-person card payments without the use of the physical

Figure 4. Contactless card payments as a share of in-person card payments, 2018–20

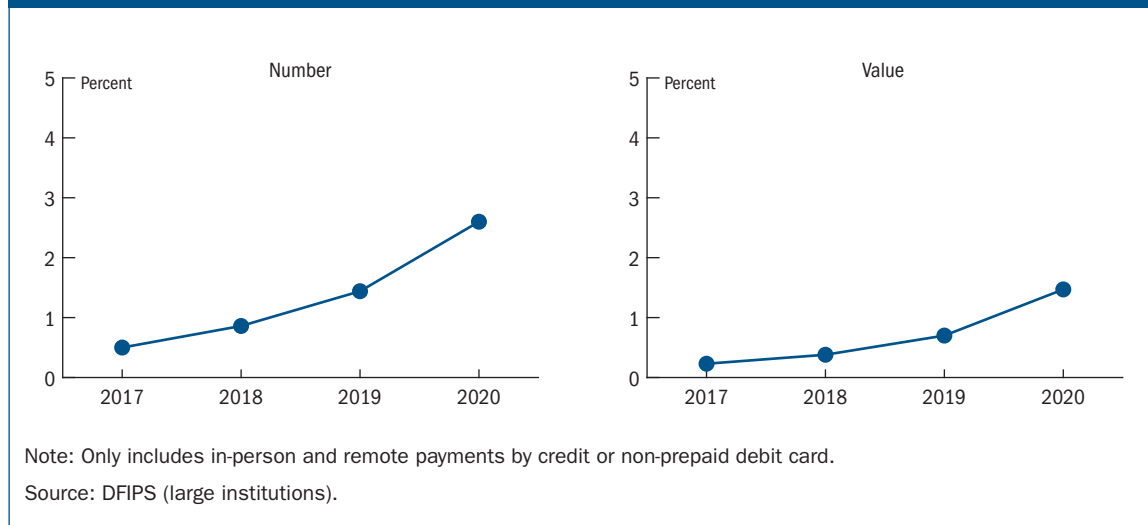


¹⁰ Although the use of contactless card payment technology has been possible for particular cards at particular merchants in the United States for about two decades, adoption by consumers and merchants remained negligible over the years. For a pre-pandemic study of consumer attitudes toward contactless cards and more discussion, see Tom Akana and Wei Ke, *Contactless Payment Cards Trends and Barriers to Consumer Adoption in the U.S.*, discussion paper, (Philadelphia: Federal Reserve Bank of Philadelphia, May 2020), <https://www.philadelphiafed.org/consumer-finance/payment-systems/contactless-payment-cards-trends-and-barriers-to-consumer-adoption-in-the-us>.

card and remote card payments without the need to manually enter and share sensitive information with a merchant, such as the card number. The pandemic could have contributed to faster growth in digital wallet card payments through both the in-person and remote channels.¹¹ The growth may have come from payers making more in-person digital wallet payments, all of which are contactless and thus attractive from a health and safety perspective, and from payers making more e-commerce payments supported with digital wallets instead of a card number entered on a merchant website or a “card on file” payment made by accessing card information retained by a merchant.

The data collected from large depository institutions through the DFIPS provides estimates of the annual shares of digital-wallet-based payments among credit and non-prepaid debit card payments from 2017 to 2020.¹² By 2020, as a share of all credit and non-prepaid debit card payments, digital wallet payments reached 2.60 percent by number and 1.47 percent by value, up from 0.50 percent and 0.23 percent, respectively, in 2017 (figure 5). The share of digital wallet payments in card payments increased more rapidly in recent data, climbing about twice as fast from 2019 to 2020 (1.16 percentage points by number and 0.77 percentage point by value) than from 2018 to 2019 (0.58 percentage point and 0.32 percentage point, respectively). Such faster growth from 2019 to 2020 suggests the pandemic may have resulted in account holders making more digital wallet payments than they would have otherwise.

Figure 5. Digital wallet payments as a share of card payments, 2017–20



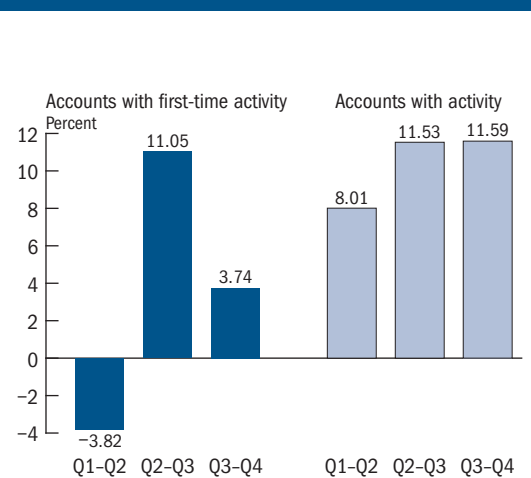
¹¹ The survey collected data on in-person and remote digital wallet payments, but not enough responses were provided to estimate their volumes or shares separately in this report.

¹² Few depository institutions provided data on the use of digital wallets with prepaid debit cards. Thus, prepaid debit cards are excluded from this analysis.

In addition to digital wallet payment volumes, the FRPS collected quarterly data for 2020 from large depository institutions on the number of customer bank accounts with digital wallet activity. The quarter-over-quarter change in (a) the number of accounts with activity and (b) the number of accounts with first-time activity sheds light on how digital wallet adoption evolved throughout 2020 (figure 6).¹³ The data show that digital wallet adoption fell as the pandemic was taking hold, indicated by the decline from the first quarter to the second quarter in the number of accounts with first-time activity.

One potential explanation is that, early in the pandemic, shoppers avoided making in-person payments, including by digital wallets. In the second half of 2020, the data suggest a renewed interest in digital wallets, as indicated by growth in the number of active accounts of more than 11.5 percent, both from the second quarter to the third quarter and from the third quarter to the fourth quarter. Of the two quarters, the third quarter was a period of notable growth in the number of accounts with first-time activity, with an increase of 11.05 percent relative to the second quarter. Given that the third quarter in 2020 was a period of cautious reopening following the strictest lockdowns in the previous quarter, the surge in first-time activity in the third quarter suggests that much of the growth came from new customers using digital wallets to make in-person payments.

Figure 6. Quarterly rate of change in the number of accounts with digital wallet payment activity, 2020



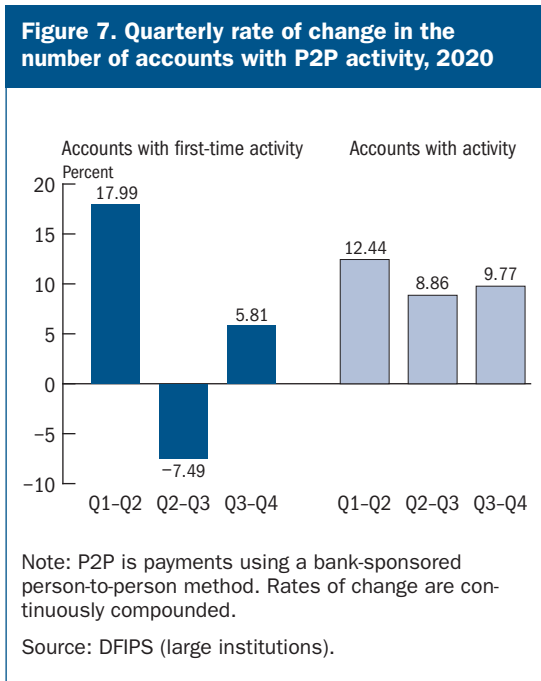
Note: All active accounts refers to those with at least one digital wallet payment in a month. Newly active accounts refers only to those that had a digital wallet payment for the first time. Includes in-person and remote payments by credit or non-prepaid debit card. Rates of change are continuously compounded.

Source: DFIPS (large institutions).

P2P Payment Adoption Spiked in First Full Quarter of the Pandemic

P2P payments, including those sponsored by banks and those independently sponsored by non-bank processors, are made from one individual's account to another's and are typically initiated through a web browser (including a mobile browser), a mobile application, or an SMS/text message. Bank-sponsored P2P payments are typically settled with an ACH transfer, although a small but growing number are being settled using new real-time or "instant" payment systems. On the

¹³ For both digital wallet and P2P activity (discussed below), active accounts are defined as those with at least one payment of the type in question in a month. Depository institutions were asked to compute the number of active accounts and first-time active accounts for each month in 2020 and then report the average monthly totals for each quarter.



other hand, nonbank-sponsored P2P payments are typically settled via a card network or via a book entry between accounts held by the processor.

As with digital wallet adoption, the FRPS collected quarterly data from large depository institutions through the DFIPS on the number of accounts that used a bank-sponsored initiation method to make a P2P payment (accounts with activity) and those that made such a P2P payment for the first time (accounts with first-time activity).¹⁴ Early in 2020, the number of accounts with first-time P2P activity surged by 17.99 percent from the first quarter to the second quarter; growth in the number of accounts with activity similarly rose at a high rate of 12.44 percent over the

period (figure 7). A potential explanation is that when the shock of the pandemic was most acute, individuals adopted P2P to pay others remotely, perhaps as they sought ways to avoid the need for exchanging cash or checks.

Following the surge in the second quarter, the rate of change in accounts with first-time P2P activity declined 7.49 percent from the second quarter to the third quarter and recovered somewhat by the end of 2020, rising 5.81 percent from the third quarter to the fourth quarter. Despite such reduced interest relative to the second quarter, growth in the number of accounts with P2P activity remained relatively high throughout the rest of 2020, growing by 8.86 percent from the second quarter to the third quarter and by 9.77 percent from the third quarter to the fourth quarter.

Quarterly changes in the shares of accounts with first-time activity for digital wallet adoption (figure 6) differ from changes for P2P adoption (figure 7). From the first quarter to the second quarter, the shares of accounts with first-time digital wallet activity decreased and with P2P activity, increased. For the second quarter to the third quarter, the reverse held true. This difference highlights how the use cases for these two ways to pay are connected in different ways to social-distancing effects in the second quarter and to a relaxation of restrictive postures leading to more in-person payments in the third quarter.

¹⁴ Data on payments sponsored by independent P2P processors are not included.

Conclusion

Using new data from the 2019 and 2020 FRPS surveys, this brief identifies and discusses key changes in payment behavior from 2018 to 2020. In 2020, the first year of the global pandemic, consumers and businesses adjusted their mix of card, ACH, and check payments in ways that are notable and that suggest some clear connections to the unfolding public health situation, with ACH gaining substantial shares of noncash payments by both number and value. Total card payments declined in 2020, driven by a marked decline of in-person card payments, although the decline was partially offset by a surge in remote card payments. The remote share of card payments increased particularly from the first quarter to the second quarter of 2020, as shoppers adopted e-commerce-based alternatives to in-person purchases. The data suggest that the pandemic also affected the adoption of innovative payment methods, such as digital-wallet-based card payments and P2P payments from bank accounts. Although some of the changes observed in 2020 were at least partly a continuation of longer-term trends, the data show some early evidence of stronger behavioral shifts that may persist. Information collected by the FRPS in the future, including the upcoming triennial survey for 2021, will help determine whether the shifts identified in 2019 and, especially, 2020 will continue in the longer run.

Contact

The Federal Reserve Payments Study is a collaborative effort by staff members at the Federal Reserve Bank of Atlanta and the Board of Governors of the Federal Reserve System to track and document developments in the U.S. payments system through the collection of quantitative and qualitative survey data.

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If you have questions about the FRPS or this brief, or to be added to the FRPS mailing list, please email frpaymentsstudy@frb.gov.

Data, reports, and survey instruments are available at <https://www.federalreserve.gov/paymentsystems/fr-payments-study.htm>.

Appendix

Scope

To supplement the 2018 national estimates, the Federal Reserve Payments Study (FRPS) collected data for 2019 and 2020 in the following two data collection efforts:

DFIPS

The Depository and Financial Institutions Payments Surveys (DFIPS) were conducted with the assistance of the GCI Analytics office of McKinsey & Company.

The DFIPS survey for calendar year 2018 collected data from a representative sample of U.S. depository institutions of all types and sizes. The DFIPS surveys for 2019 and 2020 calendar years collected data from a sample of the largest institutions by deposit size (also part of the DFIPS 2018). Information on how payment shares at these large institutions changed in 2019 and 2020, while not broadly representative of the U.S. population of depository institutions, indicates how noncash payments overall may have changed in the period before the next representative survey of depository institutions, which will cover 2021.

In addition to annual data, the DFIPS survey for 2020 requested quarterly data on the distribution of in-person and remote card payments and the adoption of certain innovative ways to pay, including remote and in-person card payments with digital wallets and person-to-person (P2P) payments funded from bank deposits. Digital wallet payments, including both in-person and remote channels, were added to the surveys in 2017.

The large depository institutions have a larger proportion of large businesses compared to the smaller institutions, which have a somewhat higher proportion of consumer accounts. Estimates of the mix of accounts from the large depository institutions that responded to the surveys reflect this. The percentage of consumer accounts in all transaction accounts in the DFIPS large institution sample fluctuated between 86 percent and 87 percent by number and between 32 percent and 36 percent by value from 2015 to 2020. This share of consumer accounts is slightly less than that estimated for the population of depository institutions from the DFIPS representative sample for 2018: Consumer accounts represented 89 percent by number and 44 percent by value.

Definition: Digital Wallet, the DFIPS (reproduced from the survey form)

Report all card transactions made via a digital wallet, including tokenized digital wallet. Include: Digital wallet transactions made by using electronic devices, such as smartphone, smart watch, or activity tracker, by “tapping” the device at the point-of-sale (POS) terminal (i.e., Apple Pay, Sam-

Apple Pay, Google Pay, Fitbit Pay, Masterpass). Also include tokenized digital wallet transactions made by using customer's payment credentials saved in a virtual account number. These credentials can be stored either on a smartphone or in the cloud. When making a purchase, a substitute account number and a transaction specific code ("token") are used to process payments. This can include purchasing items online with a computer or using a smartphone to make a purchase with a browser or in-app (i.e., Apple Pay, Google Pay, Masterpass, Visa Checkout, Amex Express Checkout). Include digital wallet near-field communication (NFC) transactions, MST (magnetic secure transmission) transactions, quick response (QR) code transactions, barcode transactions, in-app transactions, or browser transactions. Do not include: Card-on-file e-commerce transactions (cardholder-initiated or merchant-initiated) (i.e., installment payment) or transactions made via contactless cards (i.e., "tap and pay").

For 2020, the following criteria apply:

- New active digital wallet accounts are accounts from which at least one value transaction via digital wallet was completed for the first time within a month.
- All active digital wallet accounts are accounts from which at least one value transaction via digital wallet was completed within a month.

NPIPS

The Networks, Processors, and Issuers Payments Surveys (NPIPS) for various years were conducted with the assistance of Blueflame Consulting and Research.

The NPIPS survey data reported in this brief cover the general-purpose card networks. The data were used to estimate the total number and value, along with related information, for credit, non-prepaid debit, and prepaid debit card payments in the United States for 2015 to 2020. Contactless card payments, a subset of chip payments, which are, themselves, a subset of the in-person channel, were added to the surveys in 2018.

In addition to annual data, the NPIPS for 2020 requested quarterly data on the distribution of in-person and remote card payments, as well as contact and contactless in-person card payments.

Definition: Contactless card payments, NPIPS (reproduced from the survey form)

Contactless card transactions (chip card or mobile device radio frequency identification (RFID), "tap" or "wave"): Contactless authentication can utilize a physical card, fob, sticker or a mobile device (typically a mobile phone) that is "tapped" to pay at a POS terminal. Contactless chip-authenticated transactions typically use RFID and/or a specialized subset of near-field communications (NFC) standards to initiate a card-based payment and may include some contactless EMV transactions.

Table A.1. Card payments by number, 2015–20

Billions

Item	2015	2016	2017	2018	2019	2020	2020			
	Annual						Q1	Q2	Q3	Q4
Total	91.9	99.1	109.8	119.6	127.4	124.4	30.5	28.3	32.4	33.1
In-person	72.7	76.7	82.2	86.1	91.1	79.4	20.9	17.0	20.9	20.7
Chip	1.4	14.7	34.2	48.7	60.4	59.7				
Contact				48.1	58.9	56.0				
Contactless				0.7	1.6	3.7				
No chip	71.3	62.0	48.0	37.4	30.7	19.7				
Remote	19.2	22.4	27.6	33.5	36.3	45.0	9.6	11.4	11.5	12.5
MOTO	2.7	2.6	2.6	2.7	2.8	2.6				
E-commerce	11.8	13.5	17.0	21.1	23.2	30.4				
Recurring/installment	3.4	4.0	4.7	5.8	7.4	9.2				
Other	1.3	2.3	3.3	3.9	2.9	2.8				

Note: Total card payments is Net, Authorized, and Settled payments as defined in the surveys. Includes general-purpose credit, non-prepaid debit, and general-purpose prepaid debit cards. Figures may not sum because of rounding.
Source: NPIPS.

Table A.2. Card payments by value, 2015–20

Trillions of dollars

Item	2015	2016	2017	2018	2019	2020	2020			
	Annual						Q1	Q2	Q3	Q4
Total	5.13	5.46	5.96	6.58	7.00	7.04	1.69	1.61	1.83	1.91
In-person	2.93	3.03	3.16	3.30	3.51	3.20	0.80	0.70	0.84	0.86
Chip	0.10	0.81	1.63	2.15	2.52	2.56				
Contact				2.13	2.47	2.45				
Contactless				0.02	0.05	0.11				
No chip	2.84	2.22	1.54	1.15	0.99	0.63				
Remote	2.19	2.43	2.79	3.29	3.49	3.85	0.89	0.92	0.98	1.06
MOTO	0.60	0.56	0.58	0.64	0.66	0.63				
E-commerce	1.20	1.27	1.44	1.75	1.91	2.28				
Recurring/installment	0.23	0.26	0.29	0.35	0.41	0.48				
Other	0.17	0.34	0.49	0.56	0.51	0.46				

Note: Total card payments is Net, Authorized, and Settled payments as defined in the surveys. Includes general-purpose credit, non-prepaid debit, and general-purpose prepaid debit cards. Figures may not sum because of rounding.
Source: NPIPS.

Table A.3. Card payments by average value, 2015–20

Dollars

Item	2015	2016	2017	2018	2019	2020	2020			
	Annual						Q1	Q2	Q3	Q4
Total	56	55	54	55	55	57	55	57	56	58
In-person	40	39	38	38	39	40	38	41	40	41
Chip	68	55	48	44	42	43				
Contact				44	42	44				
Contactless				30	32	30				
No chip	40	36	32	31	32	32				
Remote	114	108	101	98	96	86	92	81	86	85
MOTO	224	220	222	239	231	248				
E-commerce	101	94	85	83	82	75				
Recurring/installment	68	64	62	60	56	52				
Other	128	147	148	141	177	165				

Note: Total card payments is Net, Authorized, and Settled payments as defined in the surveys. Includes general-purpose credit, non-prepaid debit, and general-purpose prepaid debit cards. Figures may not sum because of rounding.
Source: NPIPS.