The Federal Reserve Payments Study 2016

A Federal Reserve System publication

The *Federal Reserve Payments Study 2016* (2016 study) is the sixth in a series of triennial studies conducted since 2001 by the Federal Reserve System to estimate aggregate trends in noncash payments in the United States. This brief contains an early look at the use of core payment systems and some new information that provides a breakdown on types of general-purpose payment card fraud. Additional detailed information will be released in 2017 as the results of further analysis become final.[1]

Estimates presented in this initial data release are based on survey data gathered from depository and financial institutions, general-purpose card networks, and processors and issuers of various private-label payment instruments.[2] The 2016 study covers the total number and value of all noncash payments estimated to have been made in 2015 by U.S. consumers and businesses, including for-profit and not-for-profit enterprises, and federal, state, and local government agencies.

Payments included in the study were initiated from accounts domiciled in the United States and typically involved the use of debit cards (including prepaid and non-prepaid cards), credit cards, electronic credit and debit transfers using the automated clearinghouse (ACH) system, or checks.[3] Prepaid debit and credit card payments include payments made with both general-purpose cards issued by depository institutions and processed over card networks and private-label cards issued by merchants and processed over proprietary networks. Prepaid debit card payments also include electronic benefit transfer (EBT) payments used to disburse certain federal and state government benefits. This study does not estimate the number and value of cash payments; however, it does provide estimates of activities related to cash payments, such as automated teller machine (ATM) cash withdrawals.

For trend analysis, the 2016 study compares the annual estimates for 2015 with estimates from previous studies. In some cases, data for 2012 or previous survey years reported in the 2013 study are updated to account for new information or to account for changes in survey questions or definitions. Some data in this initial release should be treated as preliminary and subject to revision.[4]

To help characterize fraud in the payments system with more specificity, the 2016 study collected information on payment fraud reported by fraud type by general-purpose card networks along with information about the rollout of embedded microchips in payment cards that is intended to help combat card fraud.

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[1] Research in this report is sponsored by the Federal Reserve System. Detailed data are planned to be released in the second quarter of 2017. Separate reports on the overall findings, as well as in-depth analysis on payment fraud, the *Check Sample Survey*, and the data collection process will be released as available. Starting in 2017, annual update surveys are planned to commence, with an annual update and data release in December 2017 (reporting 2016 data) and in December 2018 (reporting 2017 data). For more information, see the Federal Reserve Payments Study web page at www.federalreserve.gov/paymentsystems/fr-payments-study.htm.

[2] The Federal Reserve System appreciates the efforts of survey respondents who provided the information summarized in this report. This information enables policymakers, the payments industry, and the public to better understand payment trends and informs strategies to foster further improvements in the payments infrastructure.

[3] Virtual currencies were not included in the study. Payments over wire payment systems, which are typically used for a relatively small number of large-value interbank financial transactions, are not discussed in this report.

[4] The validation of ACH survey data collected from depository institutions and used to estimate the non-network portion of ACH payments (so-called "in-house on-us" payments) could not be completed for this release. Hence, total ACH payments as well as total noncash payment figures that include total ACH payments are preliminary.

Key Findings

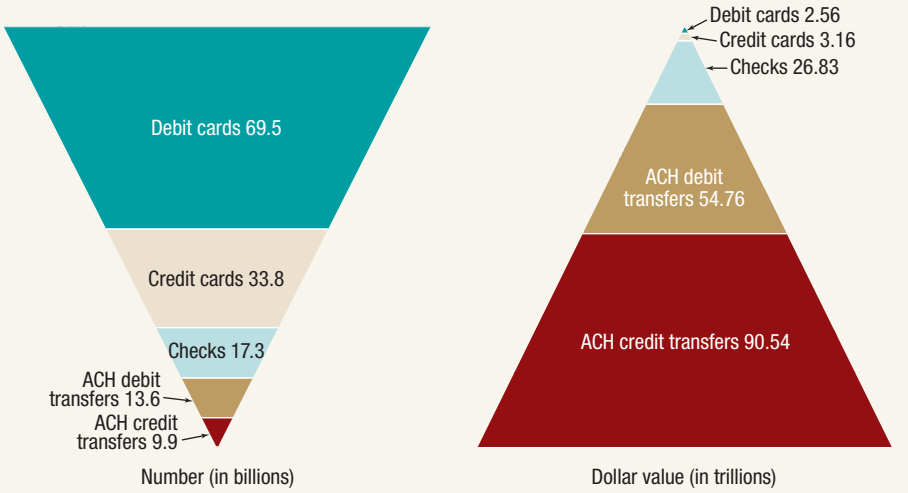
- U.S. noncash payments, including debit card, credit card, ACH, and check payments, are estimated to have totaled over 144 billion with a value of almost $178 trillion in 2015, up almost 21 billion payments or about $17 trillion since 2012. (See table 2 at the end of the brief for a presentation of most of the data discussed in this report.) Total noncash payments increased at an annual rate of 5.3 percent by number or 3.4 percent by value from 2012 to 2015.
- The number of debit card payments (including payments with prepaid and non-prepaid cards) grew to 69.5 billion in 2015 with a value of $2.56 trillion, up 13.0 billion or $0.46 trillion since 2012. This was the largest increase in number of payments among the payment types considered. Debit card payments grew at an annual rate of 7.1 percent by number or 6.8 percent by value from 2012 to 2015 with most of the growth occurring in non-prepaid debit card payments.
- The number of credit card payments reached 33.8 billion in 2015 with a value of $3.16 trillion, up 6.9 billion or $0.61 trillion since 2012. Credit card payments grew at an annual rate of 8.0 percent by number or 7.4 percent by value from 2012 to 2015, the largest growth rates among the payment types considered.
- The number of total ACH payments is estimated to have grown to 23.5 billion in 2015 with a value of $145.30 trillion, up 3.1 billion by number or $16.29 trillion since 2012. Total ACH payments are estimated to have grown at an annual rate of 4.9 percent by number or 4.0 percent by value from 2012 to 2015.
- The number of check payments fell to 17.3 billion with a value of $26.83 trillion, down 2.5 billion or $0.38 trillion since 2012.[5] Check payments fell at an annual rate of 4.4 percent by number or 0.5 percent by value from 2012 to 2015. The decline of checks over the period was slower than previous studies had shown for prior periods since 2003. The decline of checks over the period was slower than declines in previously documented periods since 2003.
- Payments with general-purpose cards using embedded microchips, which improve the security of in-person payments to help prevent fraud, have grown by 230 percent per year since 2012. But payments with the chip-based cards amounted to only about 2 percent share of total in-person general-purpose card payments in 2015, reflecting the early stages of a broad industry effort to roll out chip card technology.
- In 2015, the proportion of total general-purpose card fraud by value attributed to counterfeiting, the most prevalent type of in-person card fraud in the United States, was substantially greater than in countries where chip technology has been more widely adopted.

Noncash Payments

Taken together, debit cards (including prepaid and non-prepaid cards), credit cards, ACH credit transfers, ACH debit transfers, and checks compose a core set of noncash payment types commonly used today by consumers and businesses in the United States. These core

[5] Estimates for the number and value of check payments in calendar year 2012, which were based on data collected in March 2013, have been adjusted for comparability with survey data collected for calendar year 2015 in the present study. Similar adjustments to make annualized estimates line up more closely with the calendar year have been made for earlier study data. The methodological adjustments, which accounted for measured declines between studies, increased the total number and value of check payments estimated for previous years but had an insignificant effect on previously estimated trends.

Figure 1. Distribution of core noncash payments by type, number, and value, 2015



Note: Debit card includes non-prepaid debit, general-purpose prepaid, private-label prepaid, and electronic benefit transfers. Credit card includes general purpose and private label. Check, automated clearinghouse (ACH) credit transfers, and ACH debit transfers include interbank and on-us.

noncash payment types are used both in traditional ways, such as in-person purchases, payroll deposits, and bill payments, and in relatively new ways, such as mobile payments, e-commerce payments, and online bill payments.

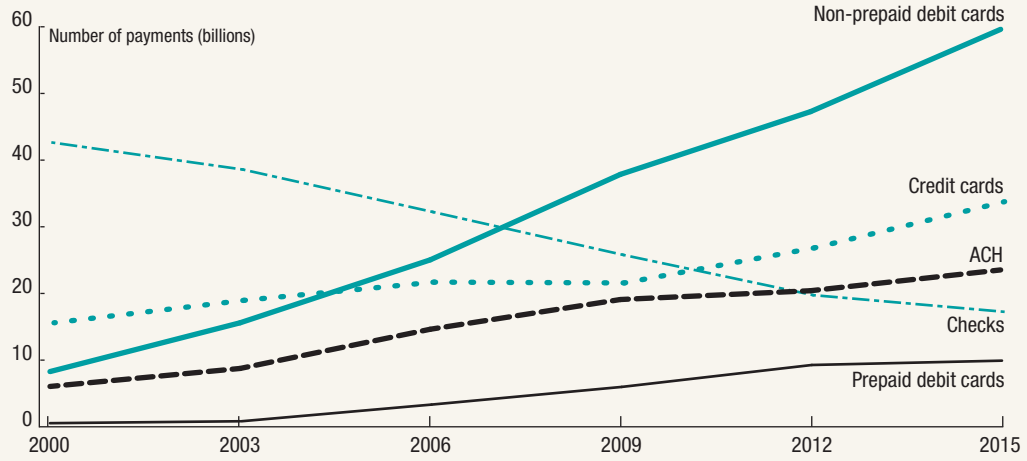
The data for 2015 as well as previous survey years show an inverse relationship between the number and value of payments across the payment types (figure 1). Debit cards held the largest share of payments by number but the smallest share by value. Credit cards were the second largest by number and the second smallest by value. At the other end of the distributions, ACH credit transfers held the smallest share by number but the largest share by value. ACH debit transfers were the second smallest by number but the second largest by value. Finally, checks now lie in the middle of both the number and value distributions.[6]

The distribution of noncash payments in 2015 is the outcome of many decades of change, with much of the transformation of the noncash payments system migrating from one dominated by checks (by number and value) to one dominated by cards (by number) and ACH payments (by value). Much of the change has occurred in the new millennium. Just over a decade ago, checks were the predominant type of noncash payment in the United States, while one by one, starting in 2007, non-prepaid debit card, then credit card, and then ACH payments (with debit transfers and credit transfers combined) overtook checks (figure 2).

The number of non-prepaid debit card payments, the type of general-purpose debit card payment typically connected to transaction accounts or "checking accounts" at depository institutions, grew 12.4 billion with a value of $0.42 trillion from 2012 to 2015, which drove almost all of the growth of the broader debit card category. Total growth over the period for non-prepaid debit cards was significantly greater by number (3.0 billion more) and slightly greater by value ($0.01 trillion more) than the category's growth from 2009 to 2012. The annual rates of growth from 2012 to 2015 were also high at 8.0 percent by number or 7.0 percent by value.

[6] Taken together, the number of ACH credit transfers and debit transfers exceeds the number of checks.

Figure 2. Trends in noncash payments 2000–15, by number



Note: Prepaid debit card includes general purpose, private label, and electronic benefit transfer.

Prepaid debit card payments, including payments made by general-purpose prepaid cards, prepaid EBT cards, and private-label prepaid store cards, are the most recently introduced type of payment considered in this report.[7] Growth in prepaid debit card payments dropped to an annual rate of 2.3 percent by number or 5.5 percent by value from 2012 to 2015, which are the slowest growth rates for the category in both number and value since 2000.

Credit card payments grew substantially from 2012 to 2015. The total growth of 6.9 billion in the number of credit card payments over this period exceeded each of the previous three-year study periods for credit cards since 2000 and corresponded to an annual growth rate of 8.0 percent since 2012, the largest among the core payment types.

As shown in previous study reports, much of the growth in ACH payments occurred from 2003 to 2006, when the number of checks being converted to ACH payments was growing substantially. Since that time, growth in ACH payments has slowed, although total ACH payments are estimated to have grown at an annual rate of 4.9 percent by number or 4.0 percent by value since 2012.

A previous Federal Reserve study showed that the use of checks by number had peaked in the mid-1990s.[8] The five previous triennial Federal Reserve payments studies showed a persistent decline in check payments, with declines accelerating in the more recent study periods. Notable in the data for the 2016 study, however, is that the long slide of check payments appears to have tapered off somewhat, with the annual rate of decline by number dropping to 4.4 percent from 2012 to 2015 compared with 6.2 percent from 2000 to 2012. The annual number of check payments is estimated to have declined by 0.8 billion per year since 2012, in contrast to the 2000–12 period when check payments are estimated to have declined by about 1.9 billion per year.

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[7] EBT cards are used for the disbursement of government benefits, such as funds provided to eligible, low-income individuals and families through the Supplemental Nutritional Assistance Program (SNAP). Estimates of transit and toll payments in 2015 using prepaid debit cards and other portable devices such as transponders, a significant type of prepaid payment, are not included.

[8] See Geoffrey R. Gerdes and Jack K. Walton III, "The Use of Checks and Other Noncash Payment Instruments in the United States," Federal Reserve Bulletin (August 2002): 360–74, www.federalreserve.gov/pubs/bulletin/2002/0802_2nd.pdf.

Card Payments

Card payments, including debit and credit card payments, grew to 103.3 billion with a value of $5.72 trillion in 2015, up 19.9 billion or $1.07 trillion since 2012.[9] Card payments grew at an annual rate of 7.4 percent by number or 7.1 percent by value from 2012 to 2015. In 2015, the number of card payments comprised over two-thirds of all noncash payments.

The number of payments with non-prepaid debit cards in 2015 accounted for nearly 60 percent of card payments and over 40 percent of all core noncash payments. The number of non-prepaid debit card payments grew somewhat faster than their value; hence, the average value of non-prepaid debit card payments dropped slightly from $40 in 2012 to $38 in 2015.

The number of prepaid debit card payments reached 9.9 billion with a value of $0.27 trillion in 2015, up 0.6 billion or $0.04 trillion since 2012. Almost all of the growth in prepaid debit card payments by number and value came from general-purpose prepaid cards, which can be used over the same general-purpose networks as non-prepaid debit cards. General-purpose prepaid card payments increased to 3.7 billion in 2015 by number, up 0.6 billion from 2012 to 2015, which was much less than the growth of 1.8 billion from 2009 to 2012.[10] The annual growth rate of 5.6 percent by number from 2012 to 2015 was also much slower than the annual growth rate of almost 34 percent reported for the 2009 to 2012 period. The average value of payments using these types of cards dropped slightly from $35 in 2012 to $34 in 2015.

Private-label prepaid card payments declined slightly by number, but rose somewhat by value from 2012 to 2015. In 2012, such payments totaled 3.7 billion by number or $0.05 trillion by value, while, in 2015, they totaled 3.6 billion by number or $0.07 trillion by value. Private-label prepaid card payments dropped at an annual rate of 0.3 percent by number but rose 15.0 percent by value. Hence, the average value of these payments rose from $13 to $20.

Payments made by prepaid EBT cards increased slightly from 2.5 billion in 2012 to 2.6 billion in 2015, or 1.7 percent per year, while the value of these payments also increased slightly from $0.07 trillion to $0.08 trillion, or 0.20 percent per year. The average value of prepaid EBT card payments declined slightly, from $30 to $29.

In 2015, non-prepaid debit and general-purpose prepaid cards were used in 5.8 billion cash withdrawals at ATMs, virtually the same level as in 2012, after dropping from 6.0 billion ATM cash withdrawals in 2009. The average value of ATM cash withdrawals rose from $118 to $122 between 2012 and 2015, continuing an upward trend in average value since 2003.[11]

The number of credit card payments was approximately half the number of debit card payments in 2015, although the value of credit card payments was nearly 25 percent greater. Growth in credit card payments was led by general-purpose credit cards, rising from 24.4 billion in 2012 to 31.0 billion in 2015, up 6.6 billion or 8.4 percent per year. With a slower growth rate by value (7.3 percent per year), the average value of general-purpose credit card payments dropped from $93 to $90 over the same period. Private-label credit card payments grew from

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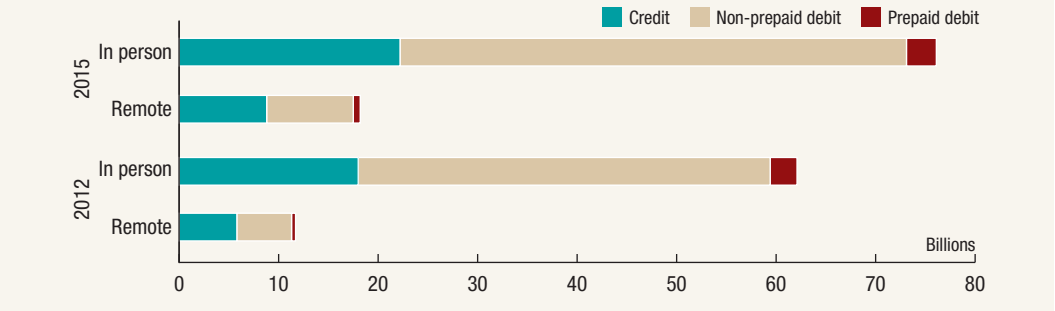
[9] All card payment figures presented in this report are called net authorized and settled payments. This means transactions initiated by the merchant's bank (the acquirer) that are completed with the final payment amount transferred from the acquirer to the card accountholder's bank (the issuer). Such transactions include those that are subsequently reversed through a chargeback or other adjustment or return.

[10] See Federal Reserve System, *The Federal Reserve Payments Study: Recent and Long-Term Payment Trends in the United States: 2003–2012 (Summary Report and Initial Data Release)*(Washington: Board of Governors and Federal Reserve System, July 2014), https://www.frbservices.org/assets/news/research/2013-fed-res-paymt-study-summary-rpt.pdf.

[11] Debit cards may also be used to obtain cash while making a purchase. Estimates for cash-back transactions are not included in this report.

Figure 3. Number of remote and in-person general-purpose card payments by card type, 2012 and 2015



2.5 billion to 2.8 billion between 2012 and 2015, or 3.8 percent per year, and the average value rose from $112 to $128.

Card payments can be made in person, typically using the card itself at a terminal. They can also be made remotely, typically using the card number, which can be entered into an e-commerce website or given over the telephone for one-time purchases or regular bill payments.

Data from the general-purpose card networks illustrate changes in in-person and remote payments (figure 3).[12] Remote payments represented 19 percent of all general-purpose card payments in 2015, up from 16 percent in 2012. Although the increase in share was modest, the growth rate of remote general-purpose card payments was about 15.3 percent per year by number, more than double the growth rate of in-person payments. Because the share of in-person payments only fell from 84 percent to 81 percent between 2012 and 2015, however, the total growth of in-person payments was 13.2 billion, over twice as much as the total growth of remote payments. Non-prepaid debit card payments led growth in both categories, with in-person card payments increasing nearly three times as much as remote payments.

General Purpose Card Fraud Types and Chips

The transition to chip cards is one of the notable recent developments intended to help thwart in-person counterfeit card fraud in the United States (box 1). In 2015, general-purpose card payments using chips reached 1.5 billion in the United States, markedly up from about 41 million in 2012. Still in the early stages of a transition in 2015 only 2 percent of U.S. in-person general-purpose card payments were made using a chip. In stark contrast, 97 percent of card-present transactions across the countries in Europe were made using chips in 2015.[13] Australia and Canada are also further along in chip deployment by several years.

The major general-purpose payment card and ATM networks for the 2015 survey provided allocations of fraudulent card transactions for six commonly recognized card-industry fraud types that can be associated with in-person or remote fraud channels:

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[12] The 2012 surveys requested payments be allocated into card-present and card-not-present categories. Corresponding categories for the 2015 surveys were renamed to "person-present" (meaning "in-person") and "remote" in order to accommodate anticipated innovations that would blur the correspondence of the card-present category with an in-person payment. Confusion can arise both because of new in-person mobile payments via card accounts loaded into mobile wallets and secure digital authentication methods that would allow cards to be considered virtually present in a remote environment. The new names are designed to retain the distinction of whether the payer and payee are co-located at the time the purchase is made. The different category names had an unknown but likely small effect on the comparison between 2012 and 2015 data.

[13] See EMVCo Worldwide Deployment Statistics web page at www.emvco.com/about_emvco.aspx?id=202.

Box 1. New Chip Cards Start to Change the U.S. Payment Fraud Picture

Many consumers have now received debit or credit cards that contain computer microchips, and merchants are increasingly requesting that cardholders insert these cards into terminals when paying in person with a chip card. The use of these secure chips can make in-person counterfeit card fraud more difficult because of built-in technology to thwart the creation of a counterfeit chip card. In the United States, however, not all merchant terminals have chip-accepting capability, and most chip cards also have magnetic stripes, allowing continued use at terminals that do not accept chips. Hence, some counterfeit card fraud based on magnetic stripes may persist for some time. Other factors also affect fraud rates, such as whether the cardholder verifies the payment with a signature or personal identification number (PIN).

Lack of widespread adoption of a more secure method of using cards, and continued use of magnetic-stripe technology for card purchases, was making the country an increasingly attractive target for card counterfeiters using stolen card data. After an extensive industry collaboration process, the United States became one of the last developed countries to adopt a specification called Europay, MasterCard and Visa, or EMV, which is the predominant type of chip card in use today.[1] Many cards had EMV chips by 2015, and card networks hastened merchant adoption of EMV through an October 2015 "liability shift," which created a financial incentive for selected merchants to accept the chip cards.[2]

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[1] EMV is a trademark of EMVCo, the organization that sets EMV specifications.

[2] According to EMVCo, 394 million EMV cards had been issued for the United States by 2015. A liability shift was announced separately by each general-purpose card company. The shared October 2015 date has been widely reported. According to card network rules, merchants subject to the liability shift are held liable for any card fraud incurred on chip cards if a chip card reader is not installed and used in a manner compliant with agreements.

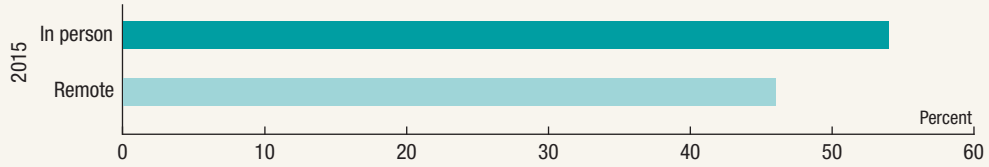
Fraud types

- **Counterfeit card:** Fraud is perpetrated using an altered or cloned card.
- **Lost or stolen card:** Fraud is undertaken using a lost or stolen card.
- **Card issued but not received:** A newly issued card sent to a cardholder is intercepted and used to commit fraud.
- **Fraudulent application:** A new card is issued based on a fake identity or on someone else's identity.
- **Other:** "Other" fraud includes account takeover and other types of fraud not covered above.
- **Fraudulent use of account number:** Fraud is perpetrated without using a physical card.

Fraud channels

- **In-person fraud:** Fraudulent payments are made when the card user is physically present.
- **Remote fraud:** Fraudulent payments are initiated when the card user is not physically present, typically online, by mail, or by telephone.

Figure 4. Distribution by value of fraudulent remote and in-person general-purpose card payments, 2015



Note: Includes fraudulent payments by general-purpose credit and debit cards. In-person fraud includes ATM fraud.

Table 1. Distribution of card fraud types for the United States and selected countries, 2015
Percent

Fraud type	2015				
	United States	Australia	Canada	France	United Kingdom
Counterfeit card	44	4	8	0	8
Lost or stolen card	11	10	5	32	13
Card issued but not received	1	4	1	1	2
Fraudulent application	3	0	3	n/a	2
Fraudulent use of account number	39	81	81	67	70
Other	2	1	3	1	4

Note: Figures may not sum because of rounding. Data for the United States include fraudulent payments by general-purpose credit and debit cards. Includes ATM fraud.
N/a Not available.

While mapping of fraud types to fraud channels is subject to some error, counterfeit and lost or stolen card fraud generally reflect in-person fraud, while fraudulent use of account number reflects remote fraud.

Data on fraud by channel in the United States show 54 percent in-person fraud compared with 46 percent remote fraud (figure 4). In comparison, the sum of counterfeit card fraud and lost or stolen card fraud for the United States is almost 55 percent, which corresponds closely to the 54 percent allocation of fraud to the in-person channel (table 1). Similarly, the sum of the remaining categories, which is dominated by fraudulent use of account number, is about 45 percent, which corresponds closely to the allocation of fraud to the remote channel. Given that the share of remote payments is estimated to have been small (19 percent) relative to the share of in-person payments (81 percent) in 2015, the data show that the remote fraud rate by value is already higher than the in-person fraud rate.

Data from other countries, which generally obtain their fraud allocation data from many of the same card networks that participated in this study, can be similarly categorized, allowing comparison of U.S. fraud shares with those in countries farther along with adoption of chip cards (table 1).[14] General-purpose card fraud figures for the United States in 2015 offer a striking contrast to comparable fraud data for Australia, Canada, France, and the United Kingdom. While the balance of card fraud in the United States is weighted toward in-person fraud, fraud in other countries is highly skewed toward remote fraud. Reports from leading chip-adopting countries have cited declining counterfeit fraud accompanying rising chip adoption,

[14] Chip card payments in the United States are often authenticated with a signature, while in the other countries, the preponderance of chip card payments are authenticated with a personal identification number (PIN).

and a similar effect may be observed in the United States in coming years.[15] In light of the growing adoption and use of chip cards, efforts to secure remote payments will likely also grow in importance.

Automated Clearinghouse Payments

The ACH system can be used for a variety of funds transfers, most of which are payments between consumers and businesses. The ACH includes both credit transfers and debit transfers. ACH credit transfers are payments for which the payer's depository institution "pushes" funds to the payee's depository institution, such as direct-deposit payroll payments. ACH debit transfers are payments for which the payee's depository institution "pulls" funds from the payer's depository institution, such as an insurance or mortgage payment drawn from an individual's account on a prearranged basis.

Total ACH payments are estimated to have reached 23.5 billion with a value of $145.40 trillion in 2015, up 3.1 billion or $16.29 trillion since 2012. Most ACH payments pass between depository institutions over the ACH network and are reported by the network operators. Some depository institutions also process ACH payments between their own customers internally, called in-house on-us payments. The present in-house on-us figures are preliminary and subject to future revisions. As a result, the total ACH payments reported here are preliminary.

Payments over the ACH network, involving one or more network operators, reached 19.3 billion with a value of $41.64 trillion in 2015, up 2.6 billion or $4.76 trillion since 2012. Payments over the ACH network grew at an annual rate of 4.9 percent by number or 4.1 percent by value from 2012 to 2015.

ACH credit transfers over the network reached 8.0 billion with a value of $26.78 trillion 2015, up 1.1 billion or $4.13 trillion since 2012. The average value of ACH credit transfers over the network grew from $3,259 in 2012 to $3,333 in 2015. ACH debit transfers over the network reached 11.3 billion with a value of $14.86 trillion in 2015, up 1.5 billion or $0.63 trillion since 2012. The average value of ACH debit transfers over the network dropped from $1,456 in 2012 to $1,321 in 2015.

Check Payments

While checks start out as paper, since the Check 21 law went into effect in late 2004, check clearing has been adapting and changing.[16] Checks are now effectively all processed electronically once they enter the banking system and are increasingly being scanned and deposited electronically by businesses, often using accounting applications, and individual payees using mobile devices.

Some checks are taken out of the check clearing process and converted to ACH payments, but the practice has not grown since electronic check processing took hold. The sum of interbank, on-us, and checks converted to ACH payments is equal to total checks written (figure 5). Total

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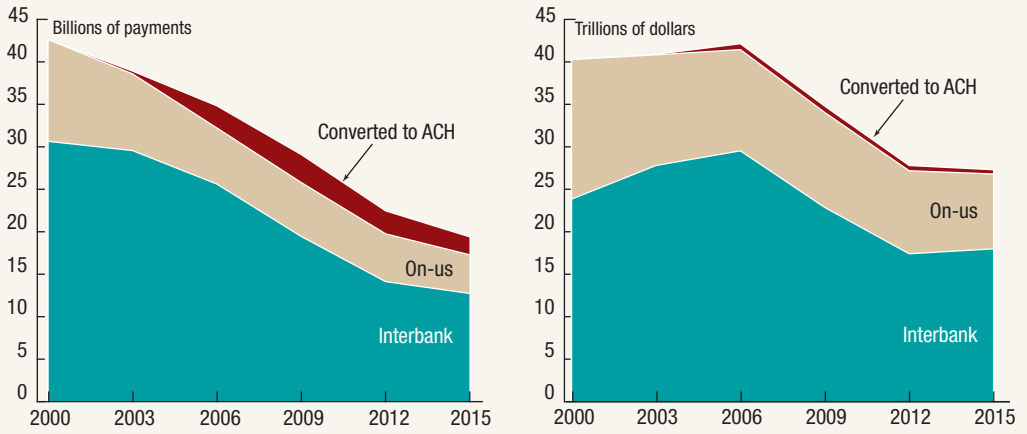
[15] According to the European Central Bank, from 2009 to 2013 "the absolute value of counterfeit [card] fraud at ATMs and POS terminals combined decreased by 51.9 percent" and "the decrease in counterfeit [card] fraud is closely linked to the migration of terminals and cards issued in Europe to EMV [chip-card] standards." See European Central Bank, "Fourth Report on Card Fraud," (Frankfurt: ECB, July 2015), 13–14, www.ecb.europa.eu/pub/pdf/other/4th_card_fraud_report.en.pdf.

[16] The Check Clearing for the 21st Century Act (Check 21) was signed into law on October 28, 2003, and became effective on October 28, 2004. Check 21 is a federal law that is designed to enable banks to handle more checks electronically as digital images, which has made check processing faster and more efficient.

Figure 5. Trends in checks written, 2000–15, by number and value



checks written fell to 19.4 billion with a value of $27.34 trillion in 2015, down 3.1 billion or $0.49 trillion since 2012. Checks written fell at an annual rate of 4.8 percent by number or 0.6 percent by value from 2012 to 2015. The average value of checks written grew from $1,239 in 2012 to $1,410 in 2015.

Check payments are composed of interbank and on-us checks and exclude checks converted to ACH payments.[17] As mentioned above, the annual decline in the number of check payments, which averaged 6.2 percent from 2000 to 2012, tapered off to 4.4 percent from 2012 to 2015. The number of interbank checks fell to 12.7 billion, down 1.4 billion, while growing in value to $18.02 trillion, up $0.58 trillion from 2012 to 2015. Interbank checks fell at an annual rate of 3.4 percent by number, while growing at an annual rate of 1.1 percent by value from 2012 to 2015. On-us checks fell to 4.5 billion with a value of $8.81 trillion in 2015, down 1.1 billion by number or $0.96 trillion by value from 2012 to 2015. On-us checks fell at an annual rate of 6.9 percent by number or 3.4 percent by value from 2012 to 2015.

About the Study

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

As in the previous studies, estimates reported in the 2016 study are based on information gathered in three survey efforts: the *2016 Depository and Financial Institutions Payments Survey;* the *2016 Networks, Processors, and Issuers Payments Surveys;* and the *2016 Check Sample Survey*. Brief descriptions of these survey efforts are provided below.[18] Aggregate estimates are developed from individual institutional survey response data collected in the surveys, which remains confidential.

[17] Once converted, the check is considered a "source document" for the ACH payment.

[18] Readers may wish to consult future reports and descriptions of each survey effort that will be posted on the Federal Reserve's website at www.federalreserve.gov/paymentsystems/fr-payments-study.htm as they become available.

Depository and Financial Institutions Payments Survey

The *2016 Depository and Financial Institutions Payments Survey* (DFIPS), administered with the help of GCI Insights, a division of McKinsey & Company, collected the number and value of noncash payments, cash withdrawals and deposits posted to customer accounts, and unauthorized transactions (third-party fraud) that took place during calendar year 2015. Noncash payments include transactions by check, ACH, wire transfers, debit (including prepaid and non-prepaid) card, and credit card.

A nationally representative, stratified random sample of 3,800 depository institutions, including some credit card banks, in the United States was drawn. The largest depository institutions were sampled at a higher rate in an effort to count as many transactions as possible and reduce the error introduced by the estimation process. The sample included commercial banks, savings institutions, and credit unions. About 1,384 depository institutions provided data for the survey.

Networks, Processors, and Issuers Payments Surveys

The *2016 Networks, Processors, and Issuers Payments Surveys* (NPIPS), administered with the help of Blueflame Consulting, estimated the number and value of electronic payments in the United States for calendar year 2015. Data were collected by surveying payment networks, processors, and card issuers. Survey forms were returned by 101 payment organizations that process, clear, or settle payments. In addition, 121 transit system operators provided data.

Check Sample Survey

The *2016 Check Sample Survey* was conducted to obtain information about the distribution of checks by counterparty and purpose. Response data from several large banks that use the Viewpointe archive and from Federal Reserve Bank processing were collected but are not summarized in this report.

Table 2. Selected results, 2012 and 2015
Numbers in billions. Values in trillions of U.S. dollars

Noncash payment type	2012			2015			2012–15 Change		2012–15 CAGR (percent)	
	Number	Value	Average	Number	Value	Average	Number	Value	Number	Value
Total noncash payments	**123.5**	**160.88**	**1,302**	**144.1**	**177.85**	**1,234**	**20.6**	**16.98**	**5.3**	**3.4**
Card payments	**83.4**	**4.65**	**56**	**103.3**	**5.72**	**55**	**19.9**	**1.07**	**7.4**	**7.1**
Debit cards	**56.5**	**2.10**	**37**	**69.5**	**2.56**	**37**	**13.0**	**0.46**	**7.1**	**6.8**
Non-prepaid	**47.3**	**1.87**	**40**	**59.6**	**2.29**	**38**	**12.4**	**0.42**	**8.0**	**7.0**
Prepaid	**9.3**	**0.23**	**25**	**9.9**	**0.27**	**27**	**0.6**	**0.04**	**2.3**	**5.5**
General purpose	3.1	0.11	35	3.7	0.12	34	0.6	0.02	5.6	4.4
Private label	3.7	0.05	13	3.6	0.07	20	0.0	0.02	-0.3	15.0
Electronic benefits transfers (EBT)	2.5	0.07	30	2.6	0.08	29	0.1	0.00	1.7	0.2
Credit cards	**26.8**	**2.55**	**95**	**33.8**	**3.16**	**93**	**6.9**	**0.61**	**8.0**	**7.4**
General purpose	24.4	2.27	93	31.0	2.80	90	6.6	0.53	8.4	7.3
Private label	2.5	0.28	112	2.8	0.35	128	0.3	0.08	3.8	8.4
Automated clearinghouse (ACH) payments	**20.4**	**129.02**	**6,322**	**23.5**	**145.30**	**6,176**	**3.1**	**16.29**	**4.9**	**4.0**
Network	**16.7**	**36.88**	**2,205**	**19.3**	**41.64**	**2,159**	**2.6**	**4.76**	**4.9**	**4.1**
Credit transfers	6.9	22.64	3,259	8.0	26.78	3,333	1.1	4.13	5.0	5.7
Debit transfers	9.8	14.24	1,456	11.3	14.86	1,321	1.5	0.63	4.8	1.4
On-us[1]	**3.7**	**92.14**	**25,038**	**4.2**	**103.66**	**24,431**	**0.6**	**11.53**	**4.9**	**4.0**
Credit transfers[1]	1.6	53.92	33,421	1.9	63.76	34,173	0.3	9.84	5.0	5.7
Debit transfers[1]	2.1	38.22	18,493	2.4	39.90	16,784	0.3	1.68	4.8	1.4
Check payments	**19.7**	**27.21**	**1,378**	**17.3**	**26.83**	**1,554**	**-2.5**	**-0.38**	**-4.4**	**-0.5**
Interbank	14.1	17.44	1,234	12.7	18.02	1,416	-1.4	0.58	-3.4	1.1
On-us	5.6	9.77	1,740	4.5	8.81	1,941	-1.1	-0.96	-6.9	-3.4
Additional estimates										
Checks written[2]	**22.5**	**27.83**	**1,239**	**19.4**	**27.34**	**1,410**	**-3.1**	**-0.49**	**-4.8**	**-0.6**
Checks converted to ACH payments	2.7	0.62	227	2.1	0.50	238	-0.6	-0.11	-8.0	-6.4
ATM cash withdrawals	**5.8**	**0.69**	**118**	**5.8**	**0.70**	**122**	**0.0**	**0.02**	**-0.3**	**0.8**

Note: Card figures are defined as net, authorized and settled. Figures may not sum because of rounding. CAGR is compound annual growth rate.

[1] All ACH on-us figures are preliminary and subject to change.

[2] Checks written is the sum of "check payments" and "checks converted to ACH payments," which uses the check as a source document to initiate the ACH payment.