



2021 Interchange Fee Revenue, Covered Issuer Costs, and Covered Issuer and Merchant Fraud Losses Related to Debit Card Transactions



October 2023



The Federal Reserve System is the central bank of the United States. It performs five key functions to promote the effective operation of the U.S. economy and, more generally, the public interest.

The Federal Reserve

- **conducts the nation's monetary policy** to promote maximum employment and stable prices in the U.S. economy;
- **promotes the stability of the financial system** and seeks to minimize and contain systemic risks through active monitoring and engagement in the U.S. and abroad;
- **promotes the safety and soundness of individual financial institutions** and monitors their impact on the financial system as a whole;
- **fosters payment and settlement system safety and efficiency** through services to the banking industry and U.S. government that facilitate U.S.-dollar transactions and payments; and
- **promotes consumer protection and community development** through consumer-focused supervision and examination, research and analysis of emerging consumer issues and trends, community economic development activities, and administration of consumer laws and regulations.

To learn more about us, visit www.federalreserve.gov/aboutthefed.htm.

Contents

Preface	iii
Corrections	v
Highlights	1
Data Collections	5
Payment Card Network Survey	5
Debit Card Issuer Survey	6
Detailed Discussion	9
Card Use	9
Interchange Fees, Network Fees, and Incentives	13
Fraud	19
Issuer Costs	24
Background	31
Appendix: Tables	33

Preface

An efficient, effective, and safe U.S. and global payment and settlement system is vital to the U.S. economy, and the Federal Reserve plays an important role in helping maintain that system's integrity. The U.S. dollar payment and settlement system is composed of payment instruments and methods, systems, and institutions that have changed over time. The Federal Reserve provides currency and operates some elements of this system.

The Board of Governors of the Federal Reserve System (Board) also prescribes rules related to debit card interchange fees, as well as regulates and supervises certain payment, clearing, and settlement systems and activities that have been designated as systemically important.

The Electronic Fund Transfer Act requires the Federal Reserve Board to biennially publish data on costs incurred, and interchange fees charged or received, by debit card issuers and payment card networks. The Board conducted the first [Payment Card Network](#) and [Debit Card Issuer](#) Surveys in 2010.

Corrections

The Federal Reserve revised this report on November 7, 2023, to reflect the correction described below.

On page 14, two items on the legend of figure 8 were corrected as follows: “Single-message, covered transactions” was changed to “Dual-message, exempt transactions” and “Dual-message, exempt transactions” was changed to “Single-message, covered transactions.”

Highlights

Card Use

- In 2021, payment card networks in the United States processed 92.1 billion debit and general-use prepaid card transactions valued at \$4.3 trillion. Dual-message networks, which traditionally processed mainly signature-authenticated transactions, accounted for 68.2 and 70.4 percent of the total by volume and value, respectively, which is an increase from 2019 of 2.8 and 3.7 percentage points of the total volume and value, respectively. Single-message networks, which traditionally processed PIN-authenticated transactions, accounted for the rest.
- The total transaction volume growth rate from 2019 to 2020 was 1.4 percent, significantly less than the 7.7 average annual growth rate from 2009 to 2019. However, the growth rate increased the following year, to 14.6 percent, which is the largest transaction volume growth increase since Regulation II came into effect. By contrast, the annual growth rates in total value of debit card transactions were both significantly higher than the 8.0 average annual growth rate from 2009 to 2019, at 12.8 percent from 2019 to 2020 and 21.7 percent from 2020 to 2021.
- The transaction volume annual growth rate for dual-message networks from 2019 to 2021 was more than three times higher than for single-message networks, at 10.1 and 3.3 percent, respectively. Overall, the transaction volume growth rate for dual-message networks was higher in every year since 2009, with the exception of the period from 2015 to 2017, when the growth rate was higher for single-message networks.
- Card-not-present (CNP) transaction volume was almost one-third of total debit card transaction volume in 2021, at 32.1 percent.
- The growth rate of card-present (CP) transaction volume was negative for the first time from 2019 to 2020, at -7.2 percent. However, the growth rate became positive again from 2020 to 2021, at 11.0 percent. The CNP transaction volume growth rate from 2019 to 2020 was 33.8 percent but then decreased to 19.5 percent from 2020 to 2021. From 2019 to 2021, the CNP transaction volume growth rate remained higher than the growth rate of CP transaction volume. Overall, CNP transaction volume has consistently grown faster than CP transaction volume since 2009.
- In 2021, the average transaction value of CNP transactions was once again higher than that of CP transactions, at \$64.50 and \$37.64, respectively. However, the difference between the average transaction value of CNP and CP transactions of \$26.86 in 2021 was considerably smaller than the difference of \$44.65 in 2009.
- Since 2017, issuers subject to Regulation II's interchange fee standards (covered issuers) experienced slower transaction volume growth than issuers not subject to the interchange fee

standards (exempt issuers). The transaction volume growth rate for covered issuers from 2020 to 2021, 12.8 percent, was nearly double the average annual growth rate of 6.6 percent from 2013 to 2019. Similarly, the transaction volume growth rate for exempt issuers from 2020 to 2021, at 14.9 percent, was more than double the average annual growth rate of 7.0 percent from 2013 to 2019.

- The growth rate in the volume of prepaid card transactions from 2020 to 2021 was 8.6 percent, half the average annual growth rate of 17.2 percent observed from 2009 to 2020. By contrast, the growth rate in the volume of non-prepaid debit card transactions from 2020 to 2021 was higher, at 14.0 percent, more than twice the average annual growth rate of 6.7 percent from 2009 to 2020.

Interchange Fees, Network Fees, and Incentives

- In 2021, interchange fees across all debit and general-use prepaid card transactions totaled \$31.59 billion, an increase of 19.1 percent since 2020. This growth in interchange fees is the largest observed since Regulation II came into effect.
- The average level of interchange fees has not changed materially for covered transactions since Regulation II took effect in the fourth quarter of 2011. In 2021, the average interchange fee for covered transactions processed over single-message networks was \$0.24, and that for covered transactions processed over dual-message networks was \$0.23.
- The average interchange fee for exempt transactions processed over dual-message networks has gradually increased since Regulation II took effect, from \$0.51 in the fourth quarter of 2011 to \$0.64 in 2021. By contrast, the average interchange fee for exempt transactions processed over single-message networks has gradually fallen since Regulation II took effect, from \$0.31 in the fourth quarter of 2011 to \$0.25 in 2019, although it then rose slightly, to \$0.27 in 2021.
- Network fees sharply increased to \$11.49 billion in 2021 from \$8.38 billion in 2019, their largest growth since 2011. Acquirers paid 63.9 percent of these fees; issuers paid the rest. The share of network fees paid by acquirers increased slightly from 2019, and the share paid by issuers correspondingly decreased, consistent with trends observed since Regulation II took effect.
- The average network fee per transaction was \$0.13 in 2021, up from \$0.11 in 2019. The average network fee per transaction has gradually increased since 2011, with the largest growth in 2021. By contrast, the average network fee per transaction as a percentage of average transaction value, 0.3 percent in 2021, has not changed materially since Regulation II took effect.
- Payments and incentives (P&I) offered by networks totaled \$4.46 billion in 2021. The growth rate from 2020 to 2021, at 33.7 percent, was similar to that from 2019 to 2020 and was substantially higher than the 11.2 percent average annual growth rate observed from 2009 to 2020.

- Issuers received 39.4 percent of P&I in 2021; acquirers/merchants received the rest. After Regulation II took effect, the share received by issuers progressively decreased from its peak of 74.5 percent in 2011 to its 2021 value. By contrast, the share received by acquirers/merchants correspondingly increased, and they have received the majority of P&I since 2019.

Fraud

- In 2021, across all debit and general-use prepaid card transactions for covered issuers, fraud losses to all parties as a share of the transaction value were 17.5 basis points, or \$17.45 per \$10,000 in transaction value. This value is a product of a steady increase in fraud losses from 7.8 basis points in 2011.
- In 2021, merchants absorbed 47.0 percent of losses from fraudulent transactions reported by covered issuers, down from 55.5 percent in 2019, while issuers absorbed 33.5 percent, down from 36.3 percent in 2019. Cardholders absorbed the remainder.
- Altogether, from 2011 to 2021, the percentage of losses from fraudulent transactions reported by covered issuers absorbed by merchants steadily increased from 38.3 to 47.0 percent, while the percentage of losses absorbed by issuers steadily decreased from 59.8 to 33.5 percent.
- While the percentage of losses from fraudulent transactions reported by covered issuers absorbed by cardholders increased from 1.8 percent in 2011 to 8.2 percent in 2019, it more than doubled from 2019 to 2021, reaching 19.5 percent.
- In 2021, across all transaction categories, prepaid transactions experienced the highest increase both in fraud losses as a share of transaction value and in the incidence of fraudulent transactions as a percentage of total transactions.

Issuer Costs

- The average per-transaction authorization, clearing, and settlement (ACS) costs, excluding issuer fraud losses, among covered issuers were \$0.039 in 2021, approximately half of the 2009 value.
- In 2021, the interchange fee cap in Regulation II—\$0.21 plus 5 basis points times the value of a transaction—exceeded the average per-transaction ACS costs, including issuer fraud losses, for 77.4 percent of covered issuers and for 99.5 percent of covered transactions.

Data Collections

Payment Card Network Survey

The Board collected data for 2020 and 2021 through the two most recent Payment Card Network (PCN) Surveys, conducted in 2021 and 2022, respectively. All 13 card networks that processed debit card transactions in 2020 and 2021 completed the survey for each of those years.¹ In addition to using data from these latest PCN Surveys for this report, the Board used the data to calculate the annual information it published on the average interchange fees received by issuers across different networks.²

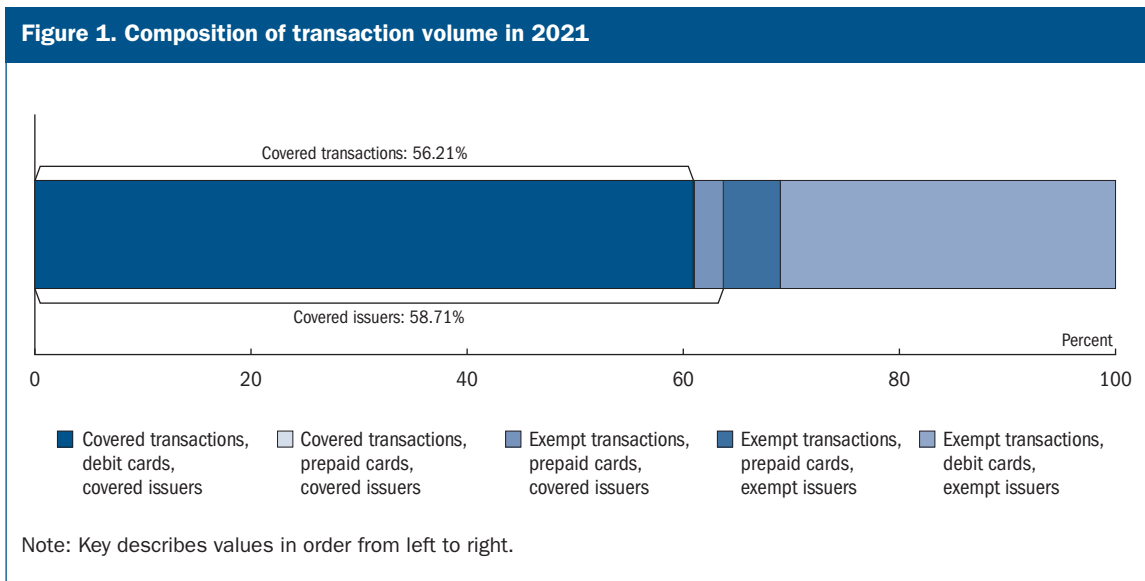
As in previous years, the most recent PCN Surveys asked respondents to report information separately for issuers covered by the interchange fee standards (covered issuers) and issuers exempt from the interchange fee standards (exempt issuers). The surveys further asked respondents to distinguish between prepaid card transactions that were covered by or exempt from the interchange fee standards. Starting from the 2013 data collection, the PCN Surveys asked respondents to distinguish exempt prepaid transactions initiated with cards issued by exempt issuers from those initiated with cards issued by covered issuers. This distinction allows transactions reported in the PCN Surveys to be categorized as either exempt or covered.³

As [figure 1](#) illustrates, the difference between the transaction volume of covered issuers, which includes transactions initiated with exempt prepaid cards issued by covered issuers, and the volume of covered transactions, which excludes those transactions, was equal to 4.2 percent of total transaction volume of covered issuers or 2.7 percent of total transaction volume of all issuers in 2021, in line with previous years. Depending on the context, this report decomposes the data either by transaction status under Regulation II (that is, exempt versus covered transactions) or by issuer status (that is, exempt versus covered issuers).

¹ The survey instructed network companies that had both dual-message and single-message networks to provide separate responses for each network. Similarly, if a network company processed both single-message and dual-message transactions over a single network, the survey instructed the network company to provide separate responses for each type of transaction performed over the network. Based on these reporting conventions, there were 18 total responses to the PCN Survey for 2021.

² Information on average interchange fees is available on the Board's website at www.federalreserve.gov/paymentsystems/regii-average-interchange-fee.htm.

³ In data collections before 2013, it was only possible to distinguish between covered and exempt issuers; that is, transactions initiated with cards issued by issuers who were covered by the interchange fee standards versus transactions initiated with cards issued by issuers who were exempt from the standard. However, some transactions initiated with cards issued by issuers who are covered by the standard may actually be exempt if the card is an exempt prepaid card.



Debit Card Issuer Survey

The Board collected data from covered issuers for 2021 through the latest Debit Card Issuer (DCI) Survey, conducted in 2022. As in previous data collections, respondents ranged from the largest debit card issuers in the United States to issuers with small debit card programs despite having consolidated assets greater than \$10 billion.⁴ The DCI Survey asked for information related to the volume and value of debit and prepaid card transactions; authorization, clearing, and settlement costs as well as other costs associated with particular debit card transactions; the incidence of and losses related to debit and prepaid card fraud; fraud-prevention and data-security costs; and interchange fee revenue. The DCI Survey instructed respondents to provide the requested information separately for debit card transactions processed over dual-message networks, debit card transactions processed over single-message networks, and prepaid card transactions for issuers with prepaid card programs.⁵

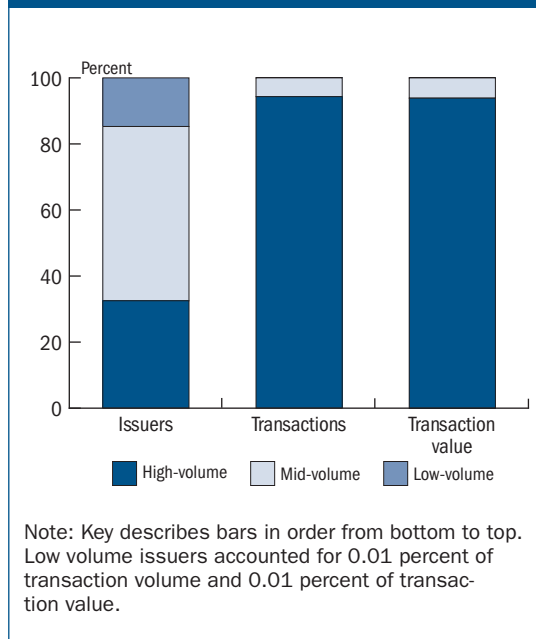
⁴ The Board distributed surveys to holding companies of covered financial institutions. These financial institutions included bank and thrift holding companies with consolidated assets of at least \$10 billion; independent commercial banks, thrifts, and credit unions with assets of at least \$10 billion; and U.S. branches and agencies of foreign banking organizations with worldwide assets of at least \$10 billion. Assets were computed using the Consolidated Financial Statements for Bank Holding Companies (FR Y-9C; OMB No. 7100-0128), the Consolidated Reports of Condition and Income (Call Reports) for independent commercial banks (FFIEC 031 & 041; OMB No. 7100-0036) and for U.S. branches and agencies of foreign banks (FFIEC 002; OMB No. 7100-0032), the Thrift Financial Reports (OTS 1313; OMB No. 1550-0023) for thrift holding companies and thrift institutions, and the Credit Union Reports of Condition and Income (NCUA 5300/5300S; OMB No. 3133-0004) for credit unions. The ownership structure of banking organizations was established using the Federal Financial Institutions Examination Council's National Information Center structure database. Participation was mandatory for institutions that were covered by the interchange fee standards in 2022, based on their consolidated assets as of December 31, 2021, and were also covered in 2021. Institutions that indicated that they did not have a debit card program in 2021 were not required to complete a survey. These institutions were typically either foreign banking organizations or other financial institutions with large nonbank affiliates that do not provide retail banking services.

⁵ Unlike the PCN Survey, the DCI Survey does not distinguish between general-use prepaid cards that were covered by the interchange fee standards and those that were exempt.

A total of 163 covered issuers responded to the 2021 DCI Survey, compared with 152 respondents for 2019. This change reflects a number of factors, including newly covered issuers that passed the \$10 billion asset threshold because of either organic asset growth or mergers and acquisitions, institutions that had assets more than \$10 billion in the past and previously reported not issuing debit cards but reported issuing cards in 2021, and changes in reporting practices of some covered issuers.

Figure 2 shows the percentage that high-, mid-, and low-volume issuers represented out of total covered issuers and the total number and value of covered issuers' transactions in 2021. In particular, 32.5 percent of the respondents processed more than 100 million debit card transactions (high-volume issuers), 52.8 percent processed between 1 million and 100 million transactions (mid-volume issuers), while the remaining 14.7 percent of respondents processed fewer than 1 million debit card transactions (low-volume issuers). As in previous data collections, high-volume issuers accounted for the vast majority of transaction volume and value. In 2021, high-volume issuers accounted for 94.3 percent of transaction volume and 93.9 percent of transaction value, mid-volume issuers accounted for 5.7 percent of transaction volume and 6.1 percent of transaction value, and low-volume issuers accounted for 0.01 percent of transaction volume and value.

Figure 2. Composition of covered issuers and transaction volume/value of covered issuers in 2021



Detailed Discussion

Card Use

The PCN Surveys have provided information about total card usage on a yearly basis since 2009.⁶ From 2009 to 2021, the volume of total card usage progressively grew from 37.6 billion transactions to 92.1 billion transactions, corresponding to an average growth rate of 7.8 percent per year (see [figure 3](#)). The growth in debit card transactions volume flattened between 2019 and 2020 because of the COVID-19 pandemic. However, the high growth rate from 2020 to 2021, equal to 14.6 percent, more than offset the temporary low growth rate in the previous year. The total value of purchase transactions also increased, growing consistently from \$1.43 trillion in 2009 to \$4.26 trillion in 2021, corresponding to an average growth rate of 9.5 percent per year.

[Figure 4](#) examines growth rates in transactions by category in 2020 and 2021 compared with average annual growth rates from the first year the data were collected through 2019. The average annual growth rate in the volume of transactions processed over dual-message networks was 8.2 percent per year from 2009 to 2019. The growth rate for dual-message transactions decreased to 3.0 percent in 2020 before sharply increasing to 17.8 percent in 2021, more than double the corresponding average annual growth rate from 2009 to 2019. By comparison, the average annual growth rate in the volume of transactions processed over single-message networks was 6.9 percent per year from 2009 to 2019, remaining lower than the corresponding value for dual-message networks. Similar to the 2020 and 2021 deviations in the growth rate for dual-message transactions, the growth rate for single-message transactions decreased to 1.2 percent in 2020 before increasing to 5.5 percent in 2021, considerably less than the corresponding average annual growth rate from 2009 to 2019. The growth rate for single-message transactions continued to remain lower than the growth rate for dual-message transactions in 2020 and 2021, in line with the historical trend.⁷

⁶ Both the PCN Survey and the DCI Survey ask respondents for data pertaining to the number and value of settled purchase transactions on debit cards. Settled purchase transactions include transactions that are later charged back or returned and exclude ATM transactions, funds loaded to card accounts for prepaid cards, and any card activity in which value was not transferred between a cardholder and a merchant, such as denials, errors, or authorizations that did not clear or were not presented for settlement. A comparison of data from the two surveys suggests a high level of consistency across network and issuer responses. Because the DCI Survey only includes covered issuers, the figures in this section come from the PCN Survey data.

⁷ As applicable, figures based on the total transaction volume for single-message networks include information on any dual-message transactions performed on those networks.

Figure 3. Transaction volume and growth rate of purchase transactions over time

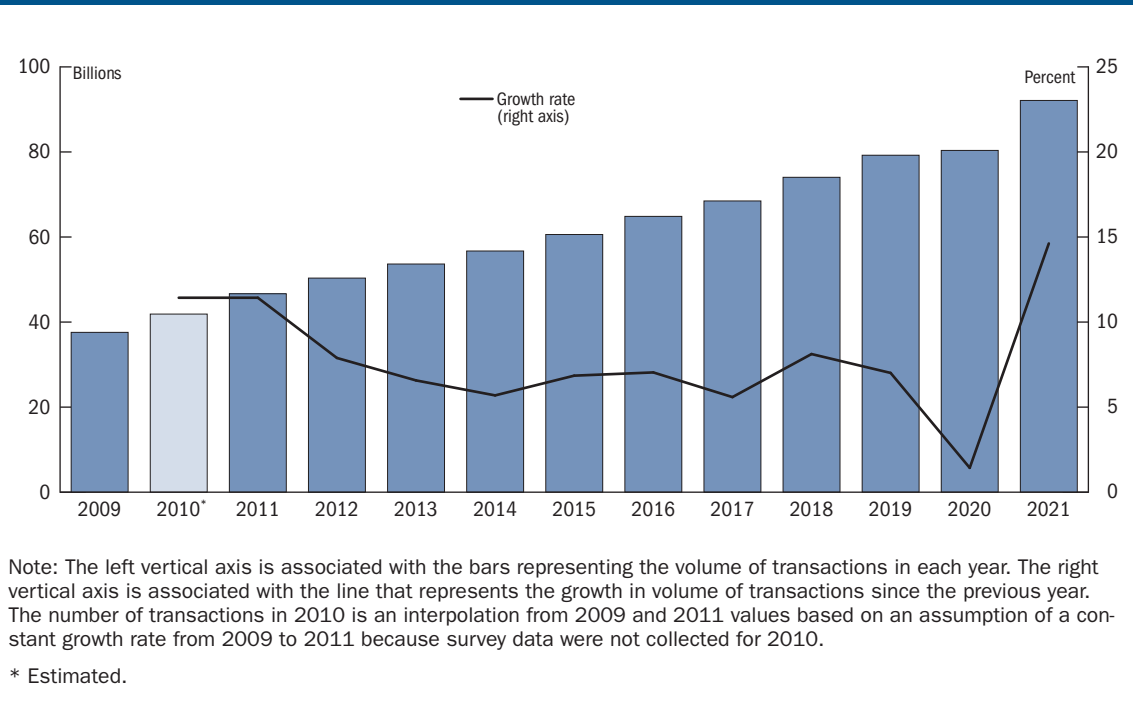
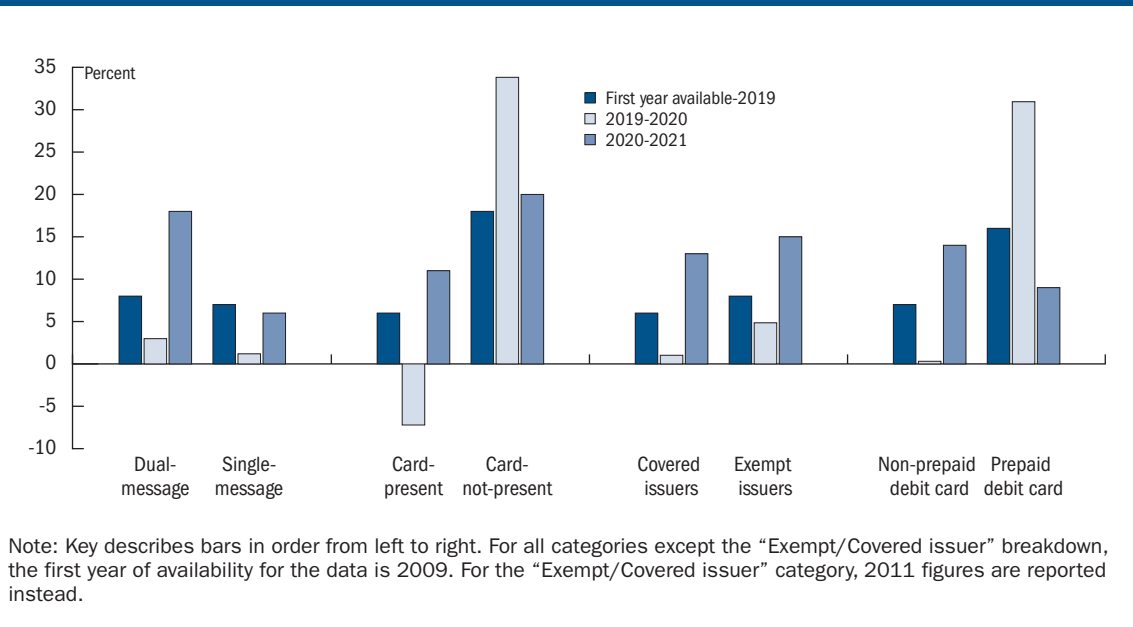


Figure 4. Average annual growth rate in transaction volume, by transaction category



In 2021, the fastest-growing category was card-not-present (CNP) transactions, as had been the case since 2013.⁸ Growth in CNP transaction volume accelerated significantly from an average annual growth rate of 17.8 percent per year from 2009 to 2019 to 33.8 percent in 2020, partially driven by consumers switching from in-person to remote purchases early in the COVID-19 pandemic.⁹ In 2021, the CNP transaction volume growth rate decreased to 19.5 percent, broadly in line with the trend prior to 2019. By contrast, card-present (CP) transaction volume in fact experienced negative growth, reversing from an average annual growth rate of 6.0 percent per year from 2009 to 2019 to -7.2 percent in 2020, before increasing to 11.0 percent in 2021.

The third set of bars in figure 4 shows the significant changes in the growth rates of transaction volume by issuer category in 2020 and 2021, respectively, relative to previous years. The growth rate in volume of transactions processed by covered issuers decreased significantly from an average annual growth rate of 6.4 percent per year from 2011 to 2019, to 1.0 percent in 2020, before sharply increasing to 12.8 percent in 2021. Similarly, the average annual growth rate in volume of transactions processed by exempt issuers also decreased significantly from 7.7 percent per year from 2011 to 2019, to 4.8 percent in 2020, before sharply increasing to 14.9 percent in 2021.

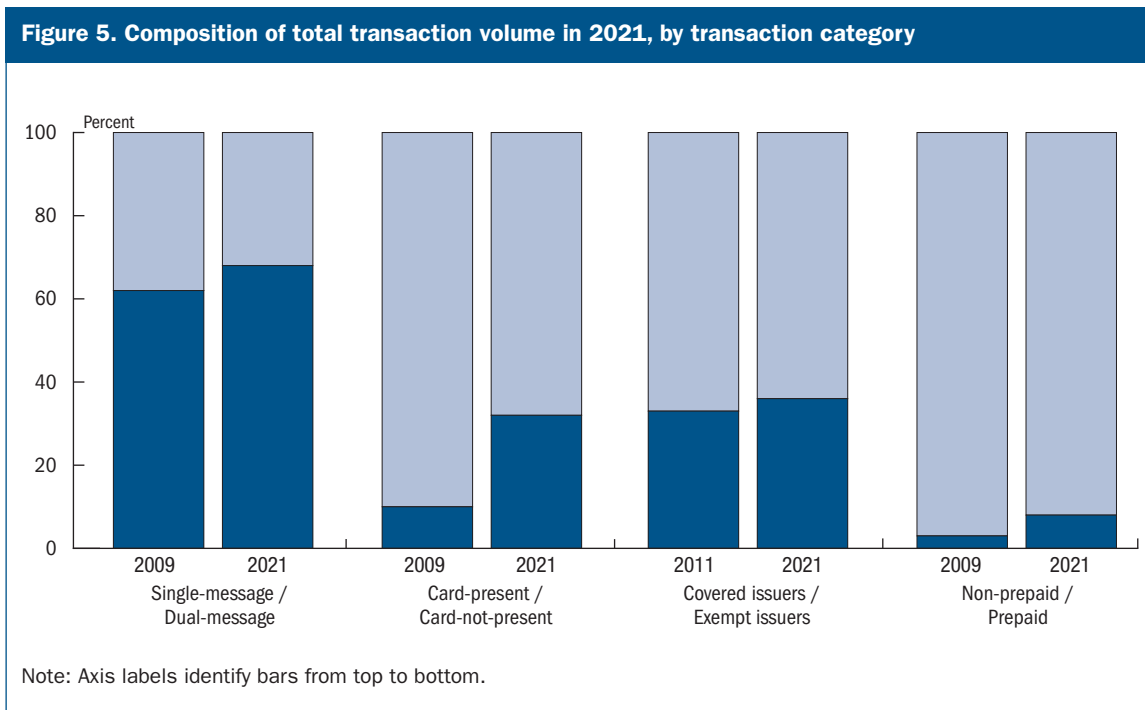
Finally, as shown by the final set of bars in figure 4, the average annual growth rate in volume of non-prepaid debit card transactions decreased significantly from 7.3 percent per year from 2009 to 2019 to 0.3 percent in 2020, before sharply increasing to 14.0 percent in 2021. However, the average annual growth rate in volume of prepaid card transactions sharply increased from 15.9 percent per year from 2009 to 2019 to 30.9 percent in 2020. This sharp increase coincided with the use of prepaid cards for the increased disbursement of unemployment insurance benefits during the COVID-19 pandemic. In 2021, the average annual growth rate in volume of prepaid card transactions significantly decreased, to 8.6 percent, returning to a growth rate more in line with the rates seen in previous years.¹⁰

While figure 4 examines the growth rates in transaction volume across different transaction categories, figure 5 focuses on the composition of total transactions within each of these categories in 2021. To better understand how the composition itself evolved over time, figure 5 also illustrates the corresponding breakdown in 2009 or 2011, at the beginning of the data collection, and

⁸ The number and value of the different categories of debit card transactions are documented in tables 2 and 3 of historical data, available at <https://www.federalreserve.gov/paymentsystems/files/regiireportsdata.xls>. CNP transactions include internet, telephone, and mail-order transactions.

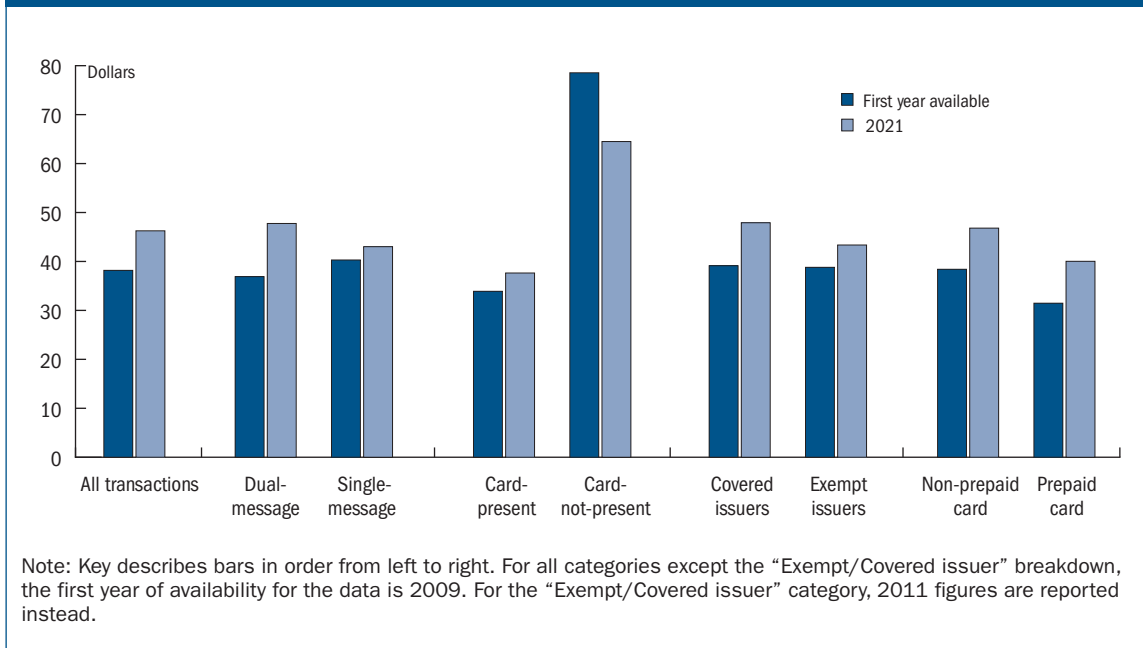
⁹ The Federal Reserve Payments Study provides additional statistics on remote and in-person card transactions during the COVID-19 pandemic. See Board of Governors of the Federal Reserve System, *Developments in Noncash Payments for 2019 and 2020: Findings from the Federal Reserve Payments Study* (Washington: Board of Governors, December 2021), <https://www.federalreserve.gov/publications/files/developments-in-noncash-payments-for-2019-and-2020-20211222.pdf>.

¹⁰ The 15.9 percent average annual growth in prepaid transactions observed from 2009 to 2019 was largely driven by the average annual growth rate that this category experienced from 2009 to 2011, equal to 42.5 percent. See table 1 of historical data.



the associated change in composition relative to that initial breakdown. In 2021, transactions processed over dual-message networks accounted for 68.2 percent of debit card transaction volume, with transactions processed over single-message networks accounting for the remaining 31.8 percent. The proportion of transactions processed over dual-message networks increased by 5.8 percentage points from 2009 to 2021. Reflecting in large part the increased popularity of online retail, the share of CNP transactions out of total transaction volume steadily increased from 2009 to 2019, reaching 23.3 percent in 2019. In 2020, the CNP share sharply increased to 30.5 percent and further increased to 32.1 percent in 2021. In total, the CNP share increased by 22.5 percentage points from 2009 to 2021. The share of transactions processed by exempt issuers increased slightly, to 36.3 percent in 2021, up 3.5 percentage points on the share in 2011. Finally, the share of prepaid transactions reached 8.1 percent in 2021, up 4.9 percentage points from 2009.

As shown in [figure 6](#), average transaction values in 2021 did not differ substantially across most transaction categories. Moreover, these values for most transaction categories were somewhat higher than they were in the first year the data were collected. CNP transactions were a notable exception in both cases. In 2021, the average value of CNP transactions was \$64.50, nearly three-quarters greater than the corresponding value for CP transactions, equal to \$37.64. While the average value of CNP transactions was still considerably higher than for all other transaction categories in 2021, it had actually fallen by over \$17 from 2009 to 2019 before growing by nearly \$3 from 2019 to 2021.

Figure 6. Average transaction value in 2021, by transaction category

Interchange Fees, Network Fees, and Incentives

The PCN Survey requests information about interchange fees; certain network fees; and payments and incentives (P&I) that are set, charged, or paid by payment card networks.¹¹ These fees and transfers vary from network to network; thus, the totals and averages reported in this section serve only as a general characterization of network practices. Moreover, P&I are usually bilateral arrangements between a network on one side and a merchant, acquirer, or issuer on the other. The figures reported in this section, calculated from network-reported totals, do not reflect the heterogeneity of these bilateral arrangements.

Figure 7 shows the main fees, as well as P&I, exchanged among networks, issuers, and acquirers/merchants in 2021. The total value of interchange fees transferred from acquirers to issuers was by far the largest: \$31.59 billion. Network fees paid by issuers and acquirers were \$4.15 billion and \$7.34 billion, respectively. In each case, these network fees were considerably higher than the P&I from networks to issuers and acquirers/merchants: \$1.76 billion and \$2.70 billion, respectively.

¹¹ Interchange fees are those fees set by the network, charged to acquirers, and received by issuers as part of a debit card transaction. The acquirer typically passes these fees on to the merchant, implying that interchange fees can be thought of as a cost to merchants. Network processing fees are total fees charged by payment card networks for services that are required for the processing of transactions by networks and do not include any fees for optional services related to transaction processing that may be provided by a payment card network or an affiliate of a payment card network, or any network fees that are not directly linked to the processing of transactions, such as membership or license fees.

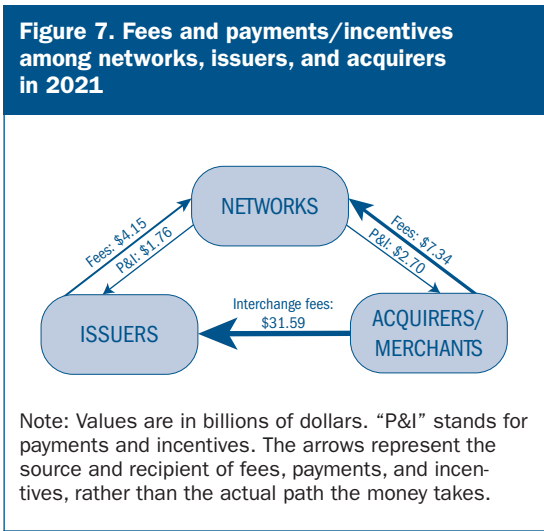
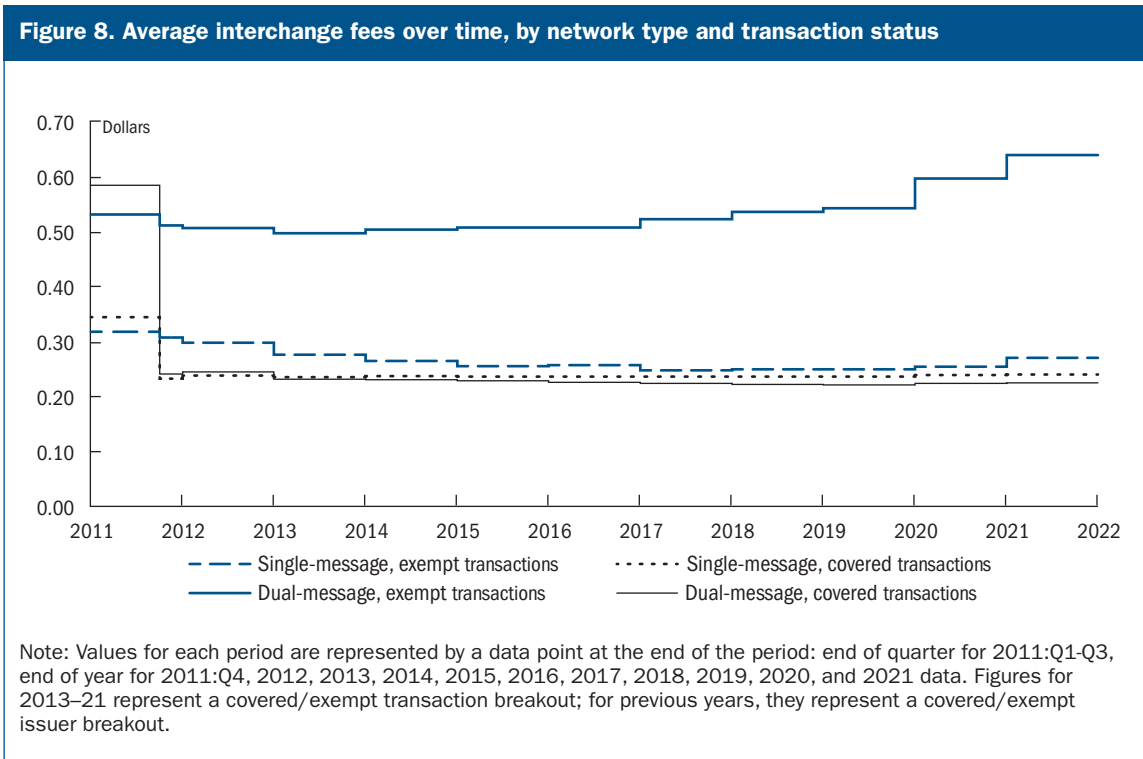


Figure 8 illustrates the evolution of average interchange fees over time, depending on network type and whether transactions were covered by or exempt from the interchange fee standards. Average interchange fees for covered transactions, both those processed over single-message and those processed over dual-message networks, have not changed materially since Regulation II took effect in the fourth quarter of 2011. In 2021, these fees stood at \$0.24 and \$0.23, respectively. In both cases, the values were slightly less than the maximum that an issuer could receive on an average covered transaction under the regulation.¹² While average interchange fees



¹² The interchange fee permitted under Regulation II’s interchange fee standards, plus the 1 cent fraud-prevention adjustment, was \$0.245 for an average covered dual-message transaction (\$49.39) and \$0.243 for an average covered single-message transaction (\$45.03) in 2021. Actual average interchange fees for covered transactions in 2021 were \$0.225 for dual-message networks and \$0.240 for single-message networks.

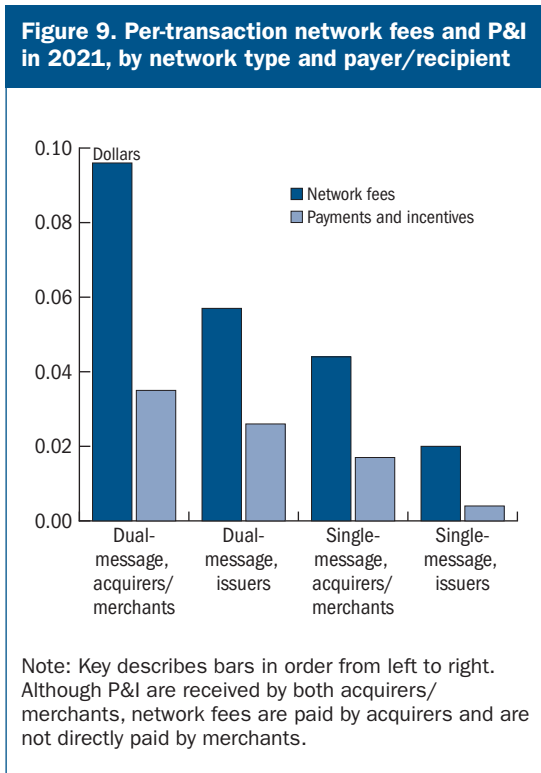
on covered transactions were higher for dual-message networks immediately after the regulation took effect, their subsequent slow-but-steady decline meant that, after 2013, average interchange fees were higher for covered transactions processed over single-message networks.

Although the average interchange fees for exempt transactions processed over dual-message networks did not change materially in the years directly after Regulation II took effect in the fourth quarter of 2011, they significantly increased annually from \$0.52 in 2017 to \$0.64 in 2021. Nonetheless, the average interchange fees for exempt transactions processed over single-message networks changed materially directly after Regulation II took effect, decreasing from \$0.32 in 2011 to \$0.26 in 2015. The average interchange fees for exempt transactions processed over single-message networks then remained fairly stable until 2019, decreasing only slightly to \$0.25 in 2019 before increasing to \$0.27 in 2021. The average interchange fees on exempt transactions were considerably higher for dual-message networks than for single-message networks from 2011 to 2021.

Reflecting the different levels of and trends in interchange fees for covered and exempt transactions, the average interchange fee per exempt transaction processed over single-message networks was slightly higher than that for covered transactions in 2021 (\$0.27 versus \$0.24). The difference of \$0.03 between the average interchange fee for exempt and covered transactions processed over single-message networks was small. However, after continuous annual decreases, the difference between the average interchange fee for exempt and covered transactions processed over single-message networks increased from \$0.01 in 2019 to \$0.02 in 2020. In particular, the average interchange fee for exempt transactions processed over single-message networks increased from \$0.26 in 2020 to \$0.27 in 2021, while the average interchange fee for covered transactions processed over single-message networks increased by less than \$0.01.

Unlike the small difference between the average interchange fee for exempt and covered transactions processed over single-message networks, the average interchange fee for exempt transactions processed over dual-message networks was almost three times higher than that for covered transactions (\$0.64 versus \$0.23). The difference between the average interchange fee for exempt and covered transactions processed over dual-message networks was initially large in 2011, steadily grew from \$0.27 in 2013 to \$0.32 in 2019, and then substantially increased to \$0.41 in 2021. Moreover, in 2021, interchange fees for both exempt and covered transactions processed over both single-message and dual-message networks all increased from 2020.

Figure 9 illustrates, for 2021, network fees paid by acquirers and issuers as well as P&I received by acquirers/merchants and issuers from networks. Overall, for both types of networks, all parties paid more in network fees than they received from the networks in P&I. Across network types, dual-message networks consistently charged higher network fees and disbursed higher P&I than single-message networks.



Looking across different parties and types of networks, network fees paid by acquirers were considerably higher, on a per-transaction basis, than those paid by issuers for both dual-message and single-message networks. Network fees charged by dual-message networks were considerably higher than the fees charged by single-message networks for both acquirers and issuers.

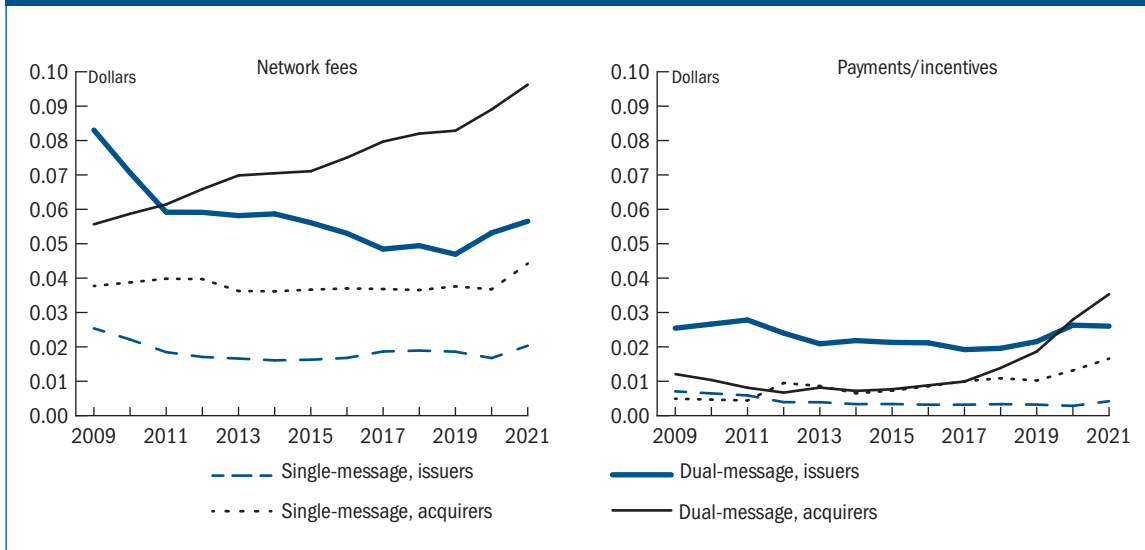
Comparing P&I received to network fees paid, the amount of P&I that acquirers/merchants received from single-message networks corresponded to around 37.5 percent of the network fees that they paid. For issuers, the corresponding value was almost half, at 20.7 percent. By contrast, the amount of P&I that issuers received from dual-message networks represented a much higher percentage (46.0 percent) of the network fees they paid

than the corresponding value for acquirers/merchants (36.7 percent). Across both network categories, the amount that acquirers/merchants received in P&I in 2021 relative to the network fees paid increased 23.5 percent since 2019, reaching its highest value since the promulgation of Regulation II.

Figure 10 shows trends over time in network fees, as well as in P&I. Focusing on network fees first, the average per-transaction network fee paid by issuers to dual-message and single-message networks remained relatively stable from 2011 to 2014. However, the average per-transaction network fee paid by issuers to dual-message networks decreased from 2014 to 2017, remained fairly stable from 2017 to 2019, and increased from 2019 to 2021. The average per-transaction network fee paid by issuers to single-message networks increased from 2014 to 2019, decreased from 2019 to 2020, and increased from 2020 to 2021. In 2021, the average per-transaction network fee paid by issuers to dual-message networks was more than double the fee paid to single-message networks.

By contrast, the average per-transaction network fee paid by acquirers to dual-message networks rose consistently from 2009 to 2021 and was the highest average per-transaction network fee across all categories after 2011. The average per-transaction network fee paid by acquirers to single-message networks remained constant from 2009 to 2020 at around \$0.04 but increased

Figure 10. Per-transaction network fees and payments/incentives for issuers and acquirers/merchants over time, by network type and payer/recipient



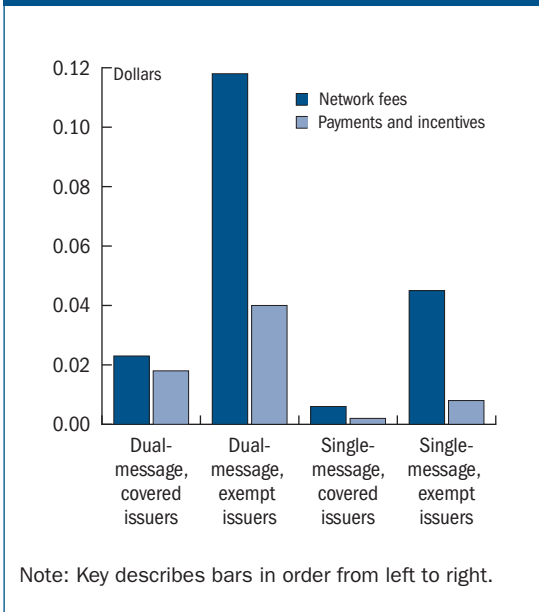
20.3 percent from 2020 to 2021. In 2021, the average per-transaction network fee paid by acquirers to dual-message networks was more than double that paid to single-message networks.

The amounts of P&I received by acquirers/merchants from both dual-message and single-message networks substantially increased from 2019 to 2021, while the same values for the amounts of P&I received by issuers remained largely stable. The P&I paid to acquirers/merchants by dual-message networks were roughly double the P&I paid by single-message networks from 2009 to 2011. This difference diminished in subsequent years, such that the level of per-transaction P&I paid to merchants and acquirers was not significantly different between dual- and single-message networks from 2013 to 2017. From 2019 to 2021, however, the P&I paid to acquirers/merchants by dual-message networks were once again nearly double the P&I paid by single-message networks. Per-transaction P&I paid to issuers by both single-message and dual-message networks remained largely stable from 2009 to 2021. Per-transaction P&I paid to issuers by dual-message networks in 2021 at \$0.03 were more than three times as high as those paid by single-message networks in 2009 at \$0.01, a difference that almost doubled from 2009 to 2021.

Figure 11 looks further at network fees, as well as P&I, and shows how they differed between covered and exempt issuers in 2021. Exempt issuers have paid higher per-transaction network fees since 2009 and received higher per-transaction P&I since 2013 than covered issuers, with these differences occurring for both dual-message and single-message networks. These relationships continued to apply in 2021.¹³ Moreover, P&I paid to exempt issuers by dual-message networks

¹³ P&I paid to issuers by networks and network fees paid by issuers are documented in tables 7 and 9 of historical data, available at <https://www.federalreserve.gov/paymentsystems/files/regioreportsdata.xls>.

Figure 11. Per-transaction network fees and payments/incentives for issuers in 2021, by network type and issuer status

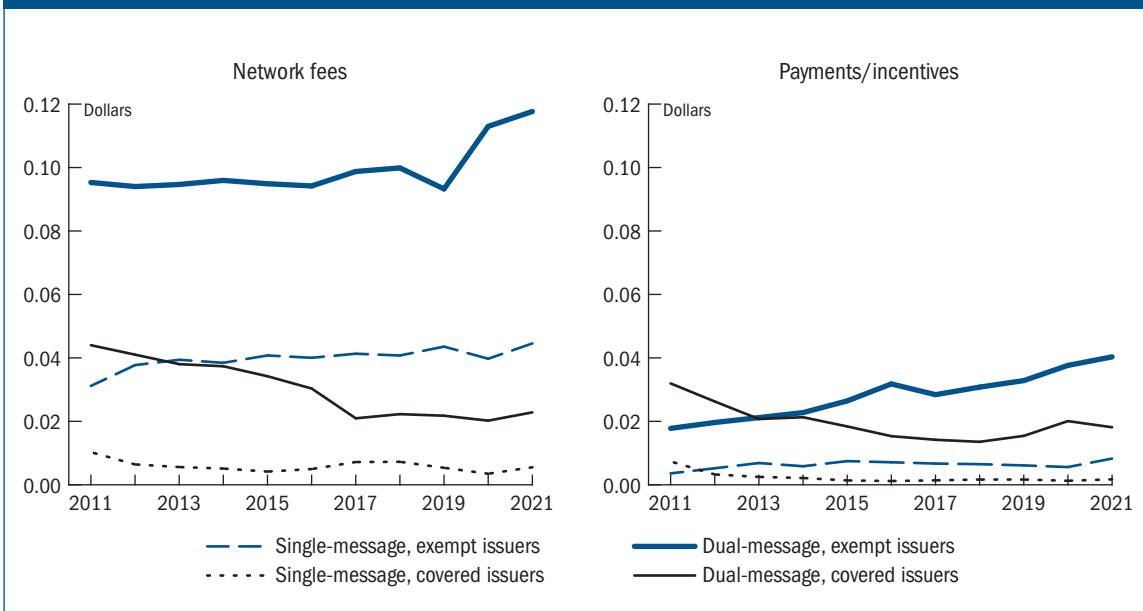


were nearly five times higher than those paid by single-message networks in 2021. P&I paid to covered issuers by dual-message networks were nearly eight times higher than those paid by single-message networks in 2021. While covered issuers received P&I equal to 79.4 and 31.1 percent of the network fees that they paid to dual-message and single-message networks, respectively, the corresponding values for exempt issuers were only 34.3 and 18.5 percent.

Figure 12 examines how network fees, as well as P&I, for covered and exempt issuers changed after 2011. The average per-transaction network fee paid by covered issuers to dual-message networks consistently fell from 2011 to 2017 and remained fairly stable from 2018 to 2021. The average

per-transaction network fee paid by covered issuers to dual-message networks remained higher than the fee paid to single-message networks, which in turn remained stable at \$0.01 after Regulation II took effect. The average per-transaction network fee exempt issuers paid to single-

Figure 12. Per-transaction network fees and payments/incentives for issuers over time, by network type and issuer status



message networks gradually increased from 2011 to 2019, fell slightly in 2020, and resumed a gradual increase again in 2021. The average network fee per transaction exempt issuers paid to dual-message networks remained roughly constant from 2011 to 2019 but increased significantly from 2019 to 2021, at a level that was more than double the fee paid by exempt issuers to single-message networks over the entire period.

From 2011 to 2021, P&I paid to exempt issuers increased for both types of networks, whereas P&I paid to covered issuers gradually fell for both types of networks. In 2011, both types of networks paid higher per-transaction P&I to covered issuers than to exempt issuers. This relationship inverted after 2011, with both types of networks paying higher per-transaction P&I to exempt issuers.

Fraud

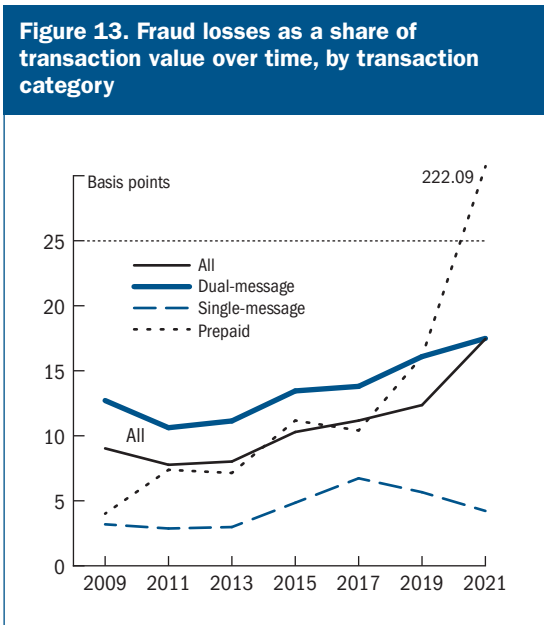
Fraud is ever-evolving and shifts toward new areas of vulnerability as new methods to prevent fraud are developed. For example, with the introduction of increased security for in-person card payments through the issuance of chip-based EMV cards, card fraud shifted from in-person fraud toward CNP, or remote, fraud.¹⁴ Furthermore, fraud can often surge in particular market segments following periods of unprecedented growth, as the latest data illustrate for prepaid card transactions. Future data collections will provide information about whether these changes reflect persistent trends or are the result of anomalous circumstances that arose during 2020 and 2021.

The fraud data presented in this section are from the DCI Survey and, therefore, only apply to covered issuers.¹⁵ Because these issuers constitute a particular segment of the total population of debit card issuers, their fraud experience may not be representative of all debit card issuers. As a result, estimates of aggregate fraud that might be derived from these data could differ from those based on information that reflects a broader set of issuers.

Figure 13 shows that, from 2019 to 2021, overall fraud losses as a share of transaction value continued the upward trend observed in previous years, rising from 12.4 basis points in 2019 to 17.5 basis points in 2021. The increase in overall fraud losses from 2019 to 2021 was driven by rising fraud losses for dual-message and prepaid transactions. In particular, fraud losses as a share of the value of prepaid transactions increased significantly and, at 222.1 basis points, were more than 55 times higher in 2021 than in 2009. Fraud losses as a share of single-message transaction value and the corresponding share for dual-message transactions both increased from

¹⁴ EMV is a technical standard for microchip-based payment cards. The term EMV stands for “Europay, Mastercard, and Visa,” the three companies that created the standard. EMVCo, a consortium of financial companies, currently manages the standard.

¹⁵ Respondents were instructed to exclude the incidence of and losses from fraudulent ATM withdrawals.



2011 to 2017, but the trends for the two transaction categories diverged after 2017. In particular, fraud losses as a share of single-message transaction value declined from 6.7 basis points in 2017 to 4.2 basis points in 2021. By comparison, the fraud losses as a share of dual-message transaction value continued to rise over this period, reaching their highest-ever value of 17.5 basis points in 2021. As a result, while in 2017 fraud losses as a share of dual-message transaction value were twice as high as losses for single-message networks, by 2021 they were four times as high.

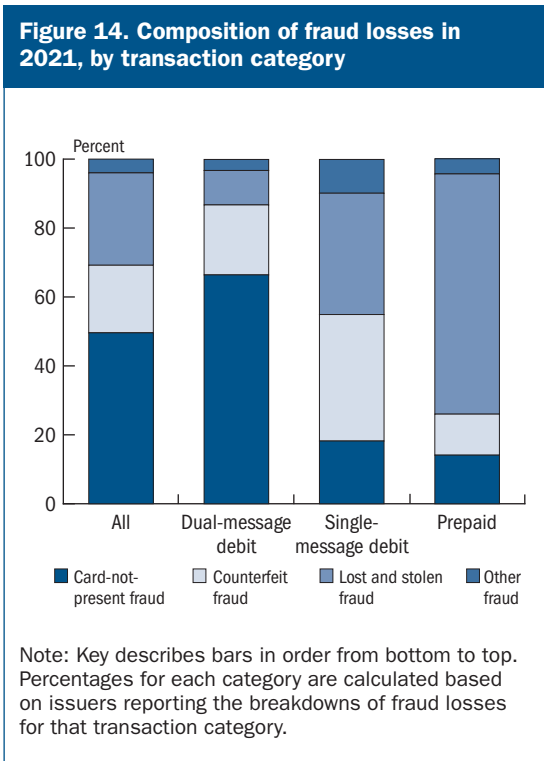


Figure 14 shows total fraud losses in 2021 to all parties expressed as a share of transaction value, broken down into four types of fraud: (1) lost and stolen fraud, (2) counterfeit fraud, (3) CNP fraud, and (4) other fraud.¹⁶ As figure 14 illustrates, CNP fraud accounted for almost half of overall fraud in 2021, at 49.6 percent. The second-largest fraud source, lost and stolen fraud, resulted in approximately half as much fraud, at 26.8 percent, and its absolute value per transaction was in line with previous years. The third-largest fraud source, counterfeit fraud, accounted for 19.6 percent of overall fraud. Other fraud accounted for the remaining 4.0 percent.

While lost and stolen fraud, counterfeit fraud, and other fraud varied moderately across dual-message and single-message transactions in 2021, the magnitude and relative significance

¹⁶ Lost and stolen fraud is fraud identified as having occurred through the use of a lost or stolen debit card. Counterfeit fraud is fraud identified as having occurred through the use of a counterfeit reproduction of a debit card. CNP fraud is fraud related to CNP transactions. Other fraud includes any fraud that cannot be categorized in the first three categories. For more information, refer to the 2021 Debit Card Issuer Survey instrument, available at <https://www.federalreserve.gov/paymentsystems/files/2021DebitCardIssuersurvey.pdf>.

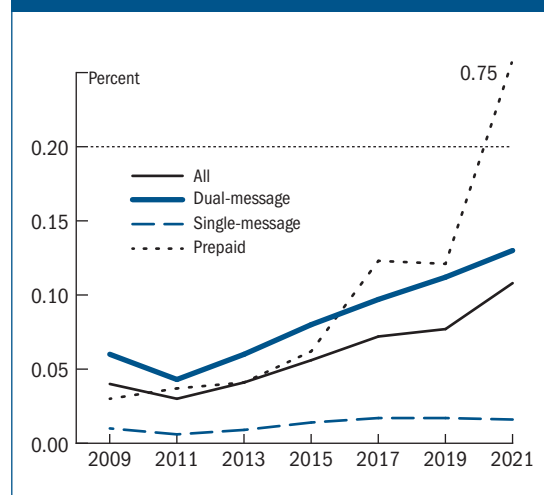
of CNP fraud varied substantially across these two transaction categories. For dual-message transactions, CNP fraud made up the majority of total fraud losses. In particular, CNP fraud losses for dual-message transactions were more than three times as large as the second-biggest category, counterfeit fraud losses, at 66.4 percent and 20.3 percent, respectively. By comparison, CNP fraud losses accounted for just 18.2 percent of fraud losses for single-message transactions, considerably less than either counterfeit fraud, at 36.7 percent, or lost and stolen fraud losses, at 35.2 percent. Lost and stolen fraud made up the majority of prepaid fraud losses, at 69.7 percent.

The relatively low value of CNP fraud losses for single-message transactions was partially driven by the fact that, in 2021, single-message networks were still used relatively rarely for CNP transactions. In particular, as table A.2 documents, the percentage of CNP transactions out of the total number and value of transactions processed over single-message networks, at 6.1 and 6.7 percent, respectively, continued to be significantly lower than the analogous percentages for dual-message networks, at 44.2 and 60.7 percent, respectively.

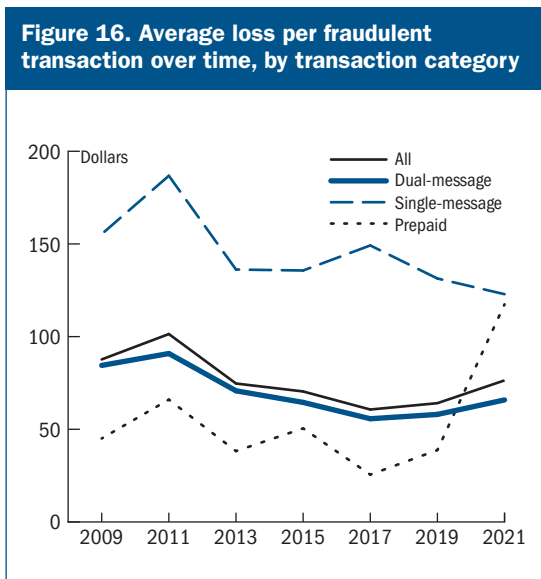
Figures 13 and 14 focus on fraud losses as a share of transaction value and the composition of fraud losses, respectively. The next two figures decompose fraud losses into two key factors: (a) fraud incidence, or the share of transactions that are fraudulent (figure 15), and (b) average fraud loss per fraudulent transaction (figure 16). The product of these two factors yields the average fraud loss per transaction.¹⁷

Figure 15 shows that overall fraud incidence exhibited a trend from 2009 to 2021 similar to that for fraud losses as a share of transaction value, shown in figure 13. In particular, fraud incidence increased from 0.077 percent in 2019 to 0.108 percent in 2021, continuing the upward trend observed from 2011 to 2019. Overall fraud incidence nearly tripled from 2011 to 2021, much as fraud losses as a share of transaction value had done over the period. Similar to the trend for fraud losses as a share of transaction value, shown in figure 13, the increase in overall fraud incidence from 2019 to 2021 was driven by the continued increase in fraud incidence for both dual-message and prepaid transactions. As

Figure 15. Incidence of fraudulent transactions as a percentage of total transaction volume over time, by transaction category



¹⁷ The average fraud loss per transaction divided by the average transaction value yields fraud losses as a share of transaction value.



had been the case since 2009, prepaid and dual-message transactions exhibited a considerably higher fraud incidence than single-message transactions in 2021.

Figure 16 shows that the average loss per fraudulent transaction across all transactions increased from 2019 to 2021, driven by a significant increase in the average loss per fraudulent transaction for prepaid transactions. As had been the case since 2009, in 2021 the average loss per fraudulent dual-message transaction was fairly similar to the average loss across all transactions. By contrast, the average loss per fraudulent prepaid

transaction rose above the average loss per fraudulent dual-message transaction for the first time since the survey was first conducted in 2009, increasing significantly from \$38.78 in 2019 to \$117.41 in 2021. Finally, despite decreasing from \$131.35 in 2019 to \$122.89 in 2021, the average loss for single-message transactions was still nearly double the corresponding value for dual-message transactions and remained higher than the corresponding value for prepaid transactions despite the sizable increase from 2019 to 2021.

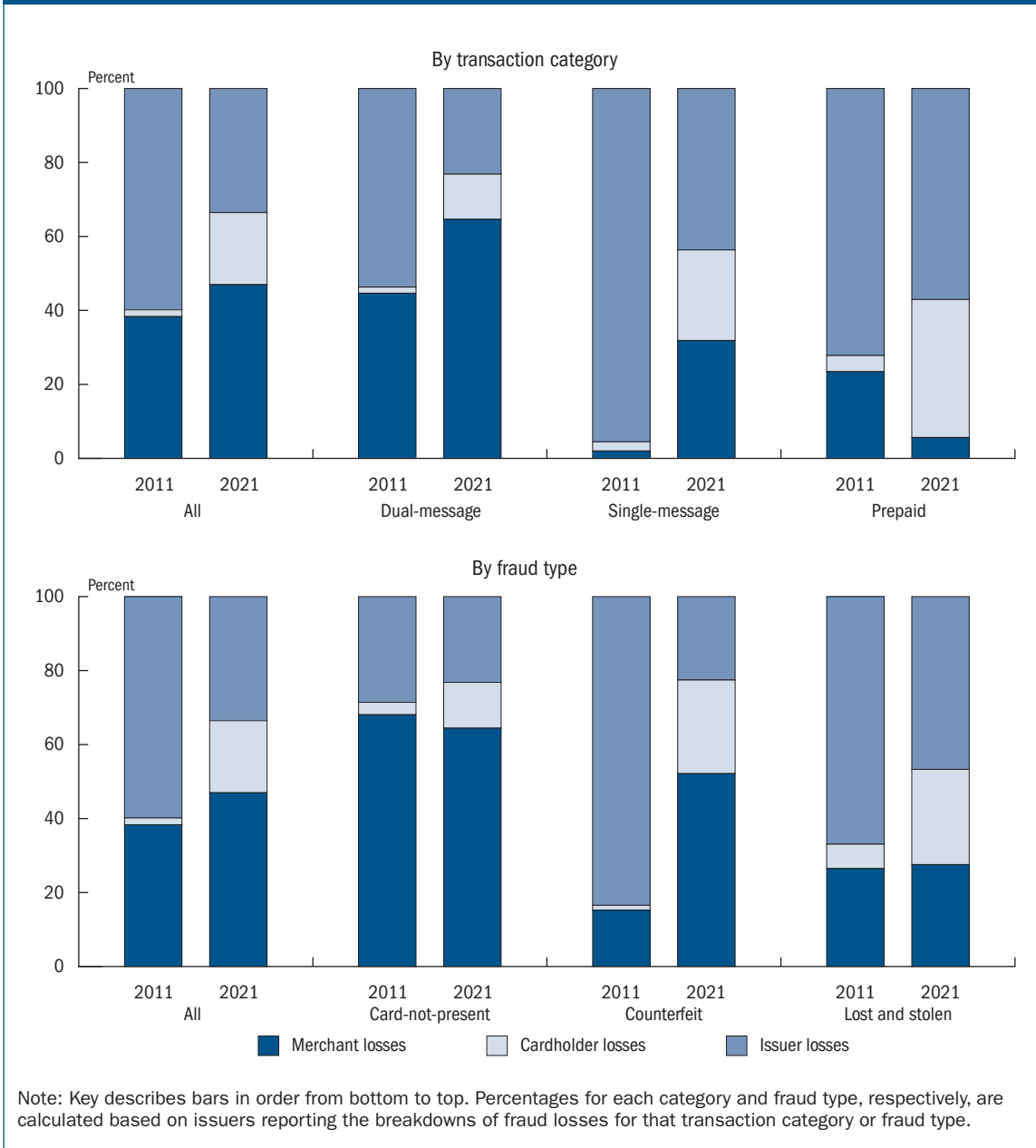
Further insights can be drawn from comparing figures 15 and 16. In particular, while figure 15 shows that single-message transactions consistently exhibited the lowest incidence of fraud from 2009 to 2021, figure 16 shows that the average loss per fraudulent transactions was higher for single-message transactions than for other transaction categories. Overall, though, the lower fraud incidence for single-message transactions outweighed the higher average fraud loss per fraudulent transaction, resulting in single-message transactions having the lowest fraud losses as a share of transaction value from among all transaction categories, as shown in figure 13.

Figure 17 breaks down fraud losses that were absorbed by merchants, cardholders, and issuers in 2011 and 2021.¹⁸ In both years, the majority of fraud losses for all transactions were absorbed by issuers and merchants. However, the composition of fraud losses for all transactions, as well as for particular transaction categories and fraud types, evolved significantly over this period.

From 2011 to 2021, for all transactions, the share of fraud losses absorbed by cardholders and issuers changed most significantly. In particular, the share of fraud losses absorbed by card-

¹⁸ The vast majority of fraud losses were absorbed by issuers, merchants, and cardholders. The data presented on merchant fraud losses assume that acquirers pass on to merchants all of the fraud losses that issuers charge back to acquirers. Data were not collected on fraud losses absorbed by networks, which are assumed to be negligible.

Figure 17. Composition of fraud losses in 2021, by transaction category and fraud type



holders rose from 1.8 percent in 2011 to 19.5 percent in 2021, while the equivalent share for issuers fell from 59.8 percent in 2011 to 33.5 percent in 2021. These changes reflect two main factors.

First, the share of fraud absorbed by different parties changed significantly for some fraud types. For example, from 2011 to 2021, the share of counterfeit fraud losses absorbed by issuers fell from 83.5 percent to 22.6 percent, while the share rose significantly for both merchants (from

15.2 percent to 52.1 percent) and cardholders (from 1.3 percent to 25.3 percent). Furthermore, the share of lost and stolen fraud losses absorbed by issuers fell from 66.9 percent to 46.7 percent, while cardholders' share rose by an almost identical amount.

Second, changes in the share of fraud losses absorbed by different parties from 2011 to 2021 also reflect a shift in the composition of debit card transactions between transaction types with different apportionment of fraud losses between the three parties. For example, because merchants absorb the majority of fraud losses for CNP transactions, the substantial shift from 2011 to 2021 towards CNP transactions (as illustrated in figure 5) contributed to the increase in the share of overall fraud losses absorbed by merchants. Similarly, the increase in the share of CNP transactions processed by single-message networks (as illustrated in the historical table 2) resulted in the share of single-message fraud being absorbed by merchants rising from 2.0 percent in 2011 to 31.9 percent in 2021.

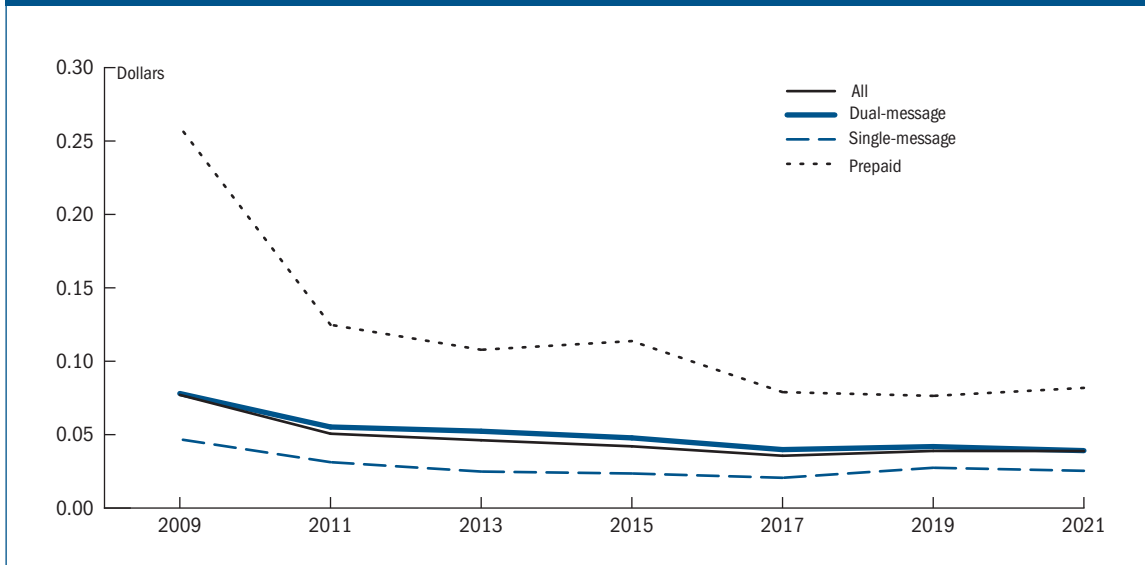
Focusing on the composition of fraud losses in 2021, the share of losses absorbed by merchants, cardholders, and issuers varied significantly across transaction categories and types of fraud. At one extreme, issuers absorbed 23.2 percent of CNP fraud losses, with merchants absorbing 64.4 percent. At the other extreme, issuers absorbed 57.1 percent of losses on prepaid transactions, whereas merchants absorbed just 5.7 percent. Merchants absorbed the majority of fraud losses for transactions processed over dual-message networks as well as the majority of fraud losses associated with CNP and counterfeit fraud.

Issuer Costs

Like the fraud data presented in the previous section, the issuer cost data presented in this section come from the DCI Survey and, therefore, apply only to covered issuers. [Figure 18](#) presents average per-transaction authorization, clearing, and settlement (ACS) costs over time for different transaction categories.¹⁹ Overall, average costs for all transactions gradually decreased, nearly halving from \$0.077 in 2009 to \$0.039 in 2021. Looking across transaction categories, in 2021 the average ACS cost of a prepaid card transaction (\$0.082) was more than twice the cost of a dual-message debit transaction (\$0.039) and more than three times the cost of a single-message debit transaction (\$0.025). This relationship, with prepaid card transactions being the most costly

¹⁹ Unless otherwise noted, the average of ACS costs in this section is calculated on a transaction-weighted basis and excludes issuer fraud losses. The average cost per transaction reflects data from all covered issuers who reported their total ACS costs in the DCI Survey. Only a subset of those issuers reported a breakdown of their ACS costs across cost categories. (Table A.13 shows both sets of averages.) These cost categories include transaction-monitoring costs, in-house costs, third-party processing fees, network processing fees, and fraud losses. Fraud losses, which generally result from an issuer's authorization, clearance, or settlement of a particular transaction that later turns out to be fraudulent, are addressed in the previous section of this report and are not included in the issuer ACS costs reported here unless noted otherwise. Issuers were instructed not to include costs related to corporate overhead, account relationships, rewards programs, nonsufficient funds handling, nonsufficient funds losses, cardholder inquiries, card production and delivery, fraud-prevention costs that are not incurred as part of authorization, costs associated with funds loads (or deposits), or costs of account set-up and maintenance. Issuers were instructed to include costs for purchase transactions, chargebacks, and other non-routine transactions.

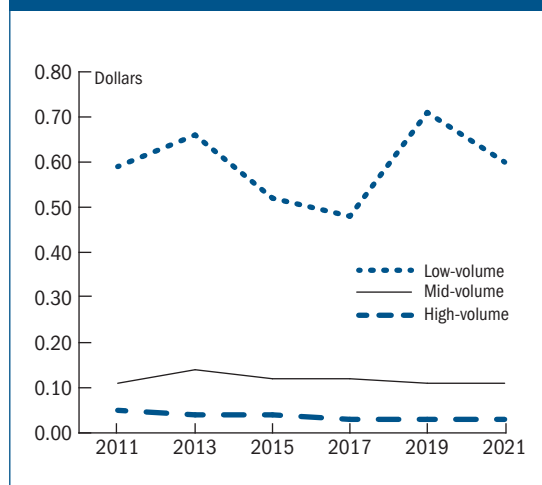
Figure 18. Average ACS costs per transaction (excluding issuer fraud losses) over time, by transaction category



and single-message transactions being the least costly, has not changed since 2009. Nonetheless, the difference between the transaction categories shrank substantially as costs declined from 2009 to 2021, with the single exception of prepaid card transactions from 2019 to 2021, where the average ACS cost increased from \$0.076 to \$0.082. Despite this increase, the highest-cost category (prepaid) exhibited the largest decline, nearly 70 percent from 2009 to 2021, while the lowest-cost category (single-message) saw the smallest decline, slightly more than 45 percent over the same period.

Figure 19 presents the average ACS costs over time by issuer size. Overall, for all years, issuers who processed more transactions consistently had lower per-transaction ACS costs on average.²⁰ In 2021, the average per-transaction ACS cost for mid-volume issuers (\$0.109) was over three times higher than the cost for high-volume issuers (\$0.035), whereas the cost for low-volume issuers (\$0.595) was more than 17 times higher than the cost for high-volume issuers. The decline

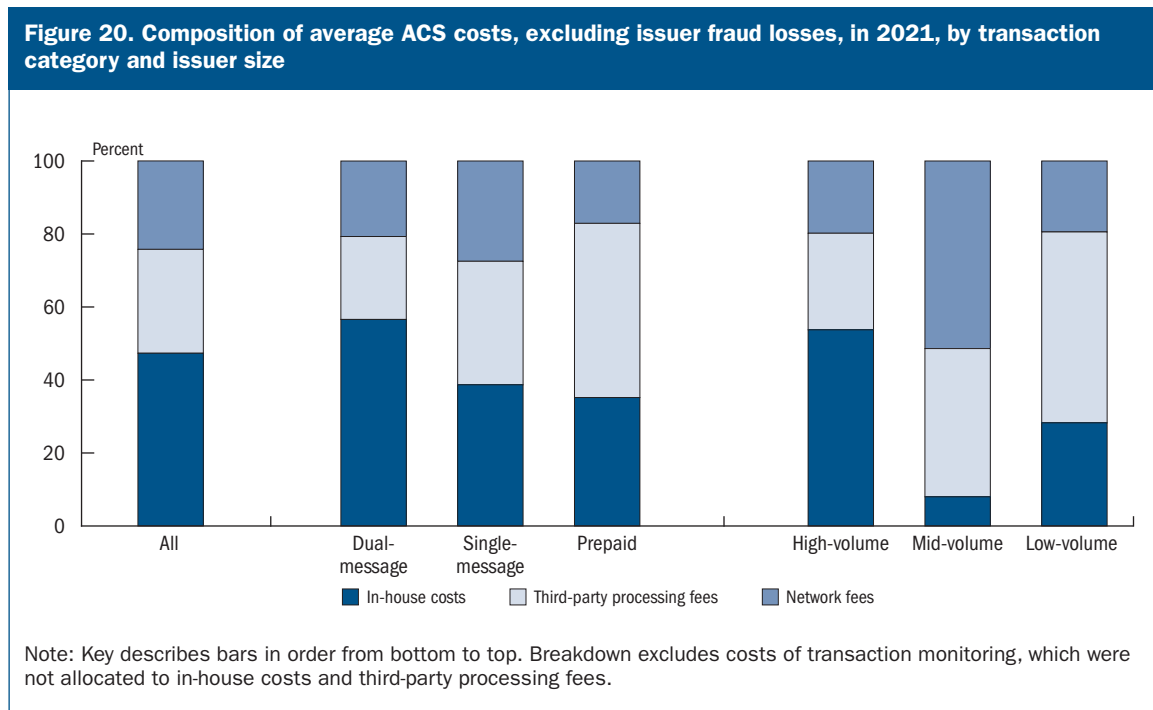
Figure 19. Average ACS costs per transaction, excluding issuer fraud losses over time, by issuer size



²⁰ Breakdown by issuer volume is not available for 2009 data. As in the earlier discussion of the composition of covered issuers by transaction volume, high-volume issuers are defined as those that process more than 100 million debit card transactions annually, mid-volume issuers as those that process between 1 million and 100 million debit card transactions, and low-volume issuers as those that process fewer than 1 million debit card transactions.

in the average per-transaction ACS cost from 2011 to 2021 is driven almost exclusively by the decline in the average pre-transaction ACS cost among high-volume issuers, from \$0.047 in 2011 to \$0.035 in 2021. Over the same period, the average per-transaction ACS cost for mid-volume issuers increased slightly before decreasing to just below its 2011 level. Lastly, the average per-transaction ACS cost for low-volume issuers changed considerably between data collections and does not show a clear trend over time.

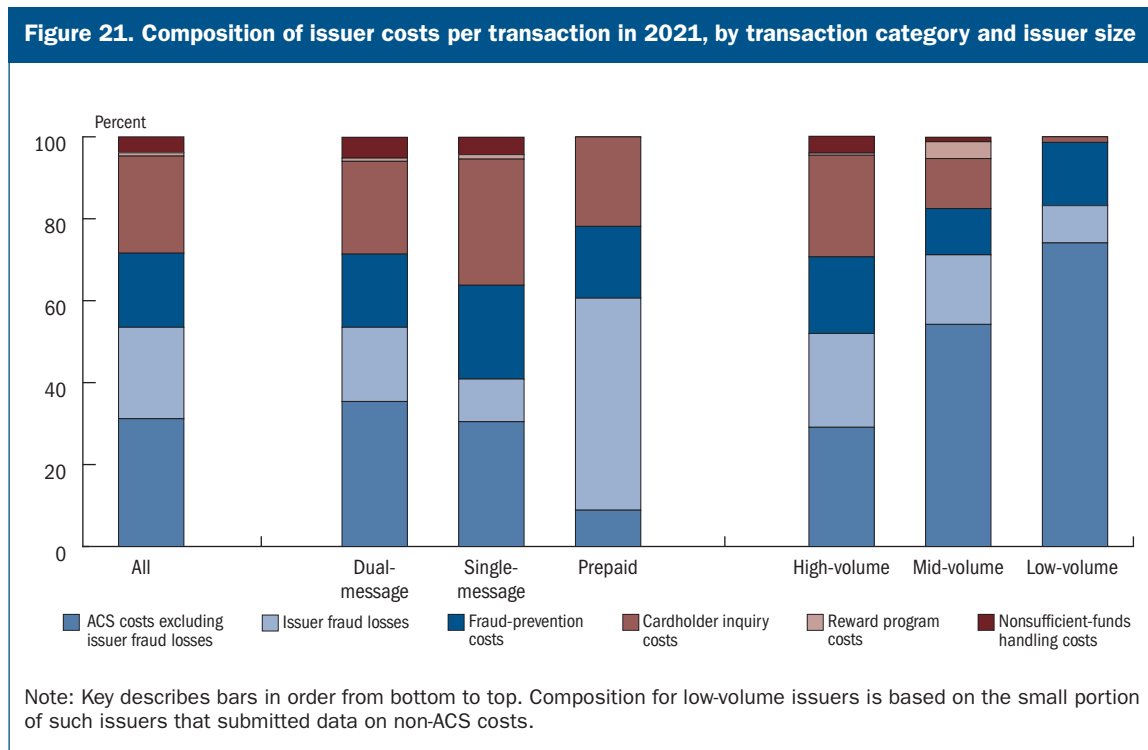
Figure 20 breaks down ACS costs in 2021 across three categories: (a) in-house costs, (b) third-party processing fees, and (c) network fees.²¹ Overall, in-house costs constituted approximately half of total ACS costs, at 47.3 percent, and third-party processing fees constituted 28.5 percent, while network fees made up the rest. This split varied substantially across transaction categories, especially the split between in-house costs and third-party processing fees. For example, in-house costs constituted almost 60 percent of total ACS costs for dual-message transactions but less



²¹ In-house costs are ACS costs that are not outsourced to third parties and include costs incurred by the card issuer or its affiliated processor (that is, a processor in the same holding company). Third-party processing fees are fees paid to external service providers for services related to the authorization, clearance, and settlement of debit card transactions that are performed by those service providers on behalf of the debit card issuer. Service providers may include payment card networks or affiliates of payment card networks to the extent that such parties provide optional services related to transaction processing. They do not include other fees charged by a payment card network or an affiliated processor for services that are required for the network processing of transactions. The 2021 DCI Survey did not request that transaction-monitoring costs be broken out into in-house costs and third-party processing fees. As a result, the breakdown of costs into in-house costs, third-party processing fees, and network fees does not include transaction-monitoring costs.

than 40 percent of costs for single-message and prepaid card transactions, while third-party processing fees constituted 47.7 percent of costs for prepaid cards, more than twice the share for dual-message transactions. Compared with the other two cost categories, network fees' share of total costs was relatively consistent across the transaction categories and issuer sizes. The only exception was mid-volume issuers, for which the ratio of network fees to total ACS costs was more than twice the corresponding ratio for low- and high-volume issuers. These patterns have not changed markedly since 2009.²²

Figure 21 illustrates how the average per-transaction ACS costs borne by issuers in 2021 compared with other costs borne by issuers in connection with their debit card programs. Overall, per-transaction ACS costs constituted around one-third of average debit card-related costs, excluding issuer fraud losses. From among all types of costs, ACS costs varied most across transaction categories and, in particular, across issuer volume tiers. Fraud-prevention costs also varied



²² The composition of ACS costs is documented in tables 13 and 14 of historical data, available at <https://www.federalreserve.gov/paymentsystems/files/regiireportsdata.xls>. The breakdown by issuer size has only been collected since 2011; all other data have been collected since 2009.

substantially across issuer volume tiers.²³ However, unlike ACS costs, there is no clear negative relationship between fraud-prevention costs and issuer volume. In particular, while mid-volume issuers had fraud-prevention costs that were 11.3 percent of total costs, those costs were significantly higher, 18.7 percent, for high-volume issuers, but only slightly higher, 15.4 percent, for low-volume issuers.

Issuer fraud losses made up a slightly larger portion of total costs for dual-message transactions and a significantly larger portion of total costs for prepaid transactions than for single-message transactions. Issuer fraud losses were also a slightly smaller portion of total costs for high-volume issuers and a significantly smaller portion of total costs for low-volume issuers than for high-volume issuers. While cardholder inquiry costs represented almost one-third of total costs for single-message transactions, cardholder inquiry costs made up a similar portion of total costs for dual-message and prepaid transactions. By transaction volume, cardholder inquiry costs were 24.8 percent of total costs for high-volume issuers and constituted much less of total costs for mid- and low-volume issuers: 12.2 percent and 1.4 percent, respectively.²⁴ Nonsufficient funds handling costs made up 5.1 percent of total costs for dual-message transactions and 4.3 percent of total costs for single-message transactions. High-volume issuers incurred 4.1 percent of total costs from nonsufficient funds handling costs, while mid-volume issuers incurred only 1.1 percent of total costs from nonsufficient funds handling costs. Reward program costs varied from 0.0 percent of total costs to 1.1 percent across categories but were generally a negligible component of average issuer costs per transaction, constituting less than 1.0 percent of overall debit card costs.²⁵

Figure 22 illustrates how average per-transaction ACS costs and other costs borne by issuers changed over time. Overall, the total issuer per-transaction cost gradually decreased from \$0.17 in 2011 to \$0.12 in 2021.²⁶ After Regulation II took effect, cardholder inquiry costs and reward program costs both declined, whereas issuer fraud losses first increased, then progressively decreased to below their 2011 levels. ACS costs progressively decreased from 2011 to 2017,

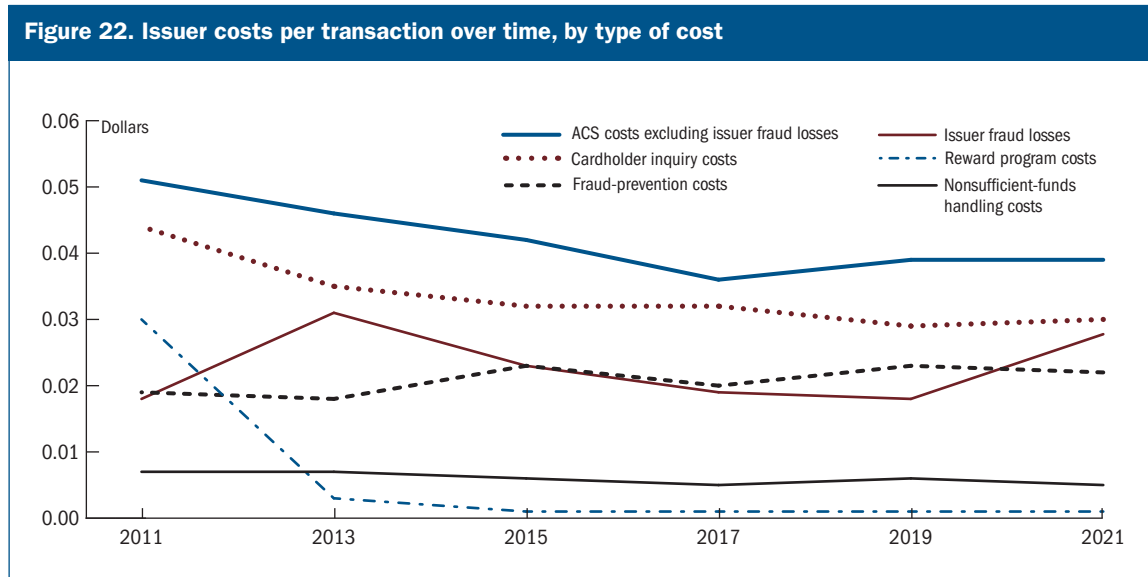
²³ Fraud-prevention and data security costs are costs related to activities aimed at identifying and preventing debit card fraud; costs related to the monitoring of the incidence of, reimbursements received for, and losses incurred from debit card fraud; costs related to responding to suspected and realized debit card fraud in order to prevent or limit losses; costs incurred in securing the data processing and communications infrastructure of debit card operations; and costs incurred in the development or improvement of fraud-prevention technologies.

²⁴ Cardholder inquiry costs exclude fraud-related cardholder inquiry costs, which are counted as part of fraud-prevention costs.

²⁵ Costs associated with cardholder inquiries include costs associated with cardholder communication with a debit card issuer related to specific debit card transactions, such as inquiries about transactions details, errors, and potential fraudulent activity. These communications do not include inquiries that are not related to specific debit card transactions, such as inquiries related to account balances, rewards programs, credit card transactions, and ATM transactions. Rewards and other incentives costs are incentive payments given to cardholders as a result of particular debit card transactions. Costs associated with nonsufficient funds handling are the costs of handling events in which an account does not have enough funds to settle an authorized debit card transaction between the time of authorization of that transaction and the settlement of that transaction.

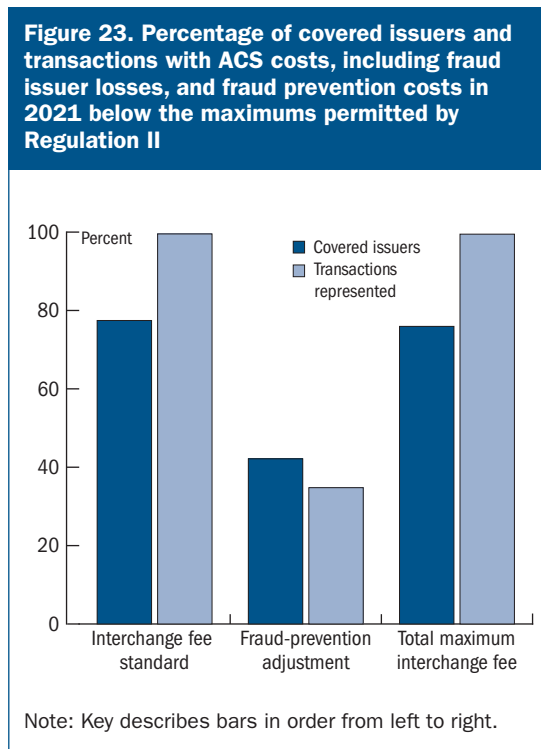
²⁶ The per-transaction cost for each year can also be calculated from table 14 of historical data, available at <https://www.federalreserve.gov/paymentsystems/files/regioreportsdata.xls>.

then increased in 2019 and stabilized in 2021. By contrast, fraud-prevention costs and nonsufficient funds handling costs remained broadly stable after 2011.



The first two columns in figure 23 show the percentage of covered issuers and transactions for which the sum of ACS costs and issuer fraud losses was less than or equal to the interchange fee permitted by the interchange fee standards. In 2021, the percentage of issuers with per-transaction ACS costs, including issuer fraud losses, less than or equal to the permissible amount was 77.4 percent, almost unchanged from 2019, while transactions associated with these issuers represented 99.5 percent of the total, up slightly from 99.4 percent in 2019, as shown in table A.15. The difference between the percentage of issuers under the maximum and percentage of transactions under the maximum reflecting the fact that issuers under the maximum processed, on average, more transactions than issuers above the maximum.

As figure 23 further shows in the middle two columns, the percentages of both covered issuers and covered transactions with per-



transaction fraud-prevention costs below the 1 cent permitted by the fraud-prevention adjustment were substantially lower than those for which per-transaction ACS costs, including issuer fraud losses, were lower than the interchange fee standards. This analysis reflects the recovery of fraud-prevention costs that would apply if all covered issuers were to receive the fraud-prevention adjustment. In 2021, 42.1 percent of covered issuers representing 34.8 percent of covered transactions had fraud-prevention costs less than or equal to \$0.01. These values represent an increase of 5.0 and 14.4 percentage points, respectively, compared with 2019.

Finally, as shown in the final part of figure 23 and table A.15, when the sum of ACS costs, issuer fraud losses, and fraud-prevention costs is compared to the total amount allowed by the interchange fee standards and the fraud-prevention adjustment, 75.9 percent of covered issuers, representing 99.5 percent of covered transactions, had combined costs lower than the total permissible interchange fee in 2021.

Background

The Electronic Fund Transfer Act requires the Federal Reserve Board to biennially publish data on costs incurred, and interchange fees charged or received, by debit card issuers and payment card networks.²⁷ The Board conducted its first data collection in 2010, collecting data from payment card networks and issuers for 2009. The information from the first, voluntary, data collection assisted the Board in developing Regulation II and was included in a report published in 2011.²⁸ Five subsequent reports summarized data collected since the initial data collection. The most recent report, released in 2021, contained information through 2019.²⁹ This report is the seventh in the series and contains data through 2021.

Currently, Regulation II establishes interchange fee standards under which, for an electronic debit transaction, an issuer with consolidated assets of \$10 billion or more may not receive or charge an interchange fee greater than \$0.21 plus 5 basis points times the value of that transaction.³⁰ An issuer that is subject to the standard may be eligible to receive an additional one cent adjustment to the interchange fee it charges or receives if the issuer meets fraud-prevention standards specified in the regulation. Electronic debit transactions made using debit cards issued pursuant to government-administered payment programs and certain reloadable general-use prepaid cards are exempt from the interchange fee standards.³¹ Additionally, an issuer with consolidated assets below \$10 billion is not subject to the interchange fee standards, provided the issuer holds the account that is debited.

Data Collections

The Board conducts two surveys to collect information about the debit card industry, both of which are mandatory under Regulation II. The Payment Card Network (PCN) Survey is conducted every year and surveys payment card networks that process debit card transactions. The Debit Card Issuer (DCI) Survey is conducted every two years and surveys issuers that are subject to the interchange fee standards in Regulation II.

²⁷ 15 U.S.C. 1693o-2(a)(3)(B) (2014).

²⁸ See 76 Fed. Reg. 43,394 (July 20, 2011).

²⁹ The reports, survey instruments, and historical data are available on the Federal Reserve Board's public website at www.federalreserve.gov/paymentsystems/regii-data-collections.htm.

³⁰ One basis point is equal to 1/100 of 1 percent.

³¹ A reloadable general-use prepaid card must meet certain conditions to be exempt from the interchange fee standards, such as not being marketed or labeled as a gift card or gift certificate.

The surveys ask respondents to report information on all debit card transactions that they process in a given calendar year.³² The surveys distinguish between general-use prepaid cards and other debit cards. Prepaid cards are cards, other payment codes, or devices that are issued on a prepaid basis for a specified amount, whether or not that amount may be increased or reloaded, in exchange for payment. General-use prepaid cards, covered by the PCN and DCI Surveys, can be redeemed upon presentation at multiple unaffiliated merchants.³³ Although Regulation II defines prepaid cards to be a subset of debit cards, for ease of exposition, this report uses terminology that distinguishes between prepaid cards and non-prepaid debit cards. In particular, the report uses the term “debit cards” to mean non-prepaid debit cards. It further uses the term “prepaid cards” to mean general-use prepaid cards that are covered by the definition of debit card in Regulation II.

The surveys also distinguish between dual-message and single-message networks. A dual-message network typically uses separate messages to authorize and clear a transaction. Traditionally, these networks processed signature-authenticated transactions.³⁴ Increasingly, however, transactions processed over these networks may not require signature authentication or may involve other methods of cardholder authentication, such as entry of a personal identification number (PIN) or biometric authentication. By contrast, a single-message network typically uses a single message to authorize and clear a transaction. Traditionally, these networks processed PIN-authenticated transactions.³⁵ Increasingly, however, transactions processed over single-message networks, such as small-value purchases and CNP transactions, may not require PIN authentication. Over time, the distinction between single-message and dual-message networks has become less clear from a functional perspective, as methods of cardholder authentication change and both types of networks develop new functionalities.³⁶ This report continues to categorize networks as single-message or dual-message because this categorization serves to distinguish networks into groupings that are widely used by the industry.

³² Under Regulation II, debit cards are cards, or other payment codes or devices, that are issued or approved for use through a payment card network to debit a transaction, savings, or other asset account and that can be used at multiple unaffiliated merchants. The surveys exclude cards that can access only automated teller machine (ATM) networks and cannot be used as a form of payment.

³³ General-use prepaid cards contrast with private-label prepaid cards, which can be used only at an individual merchant or a group of affiliated merchants. Because Regulation II does not cover cards, including prepaid cards, that can only be used at an individual merchant or a group of affiliated merchants, the surveys do not collect information on such cards.

³⁴ Because dual-message networks traditionally processed signature-authenticated transactions, they are sometimes referred to as “signature networks,” which is a term that was used in previous reports in this series.

³⁵ Because single-message networks traditionally processed PIN-authenticated transactions, they are sometimes referred to as “PIN networks,” which is a term that was used in previous reports in this series.

³⁶ For example, in some instances, a dual-message network may use a single message to authorize and clear a given transaction. Similarly, in some instances, a network that typically uses single messages to authorize and clear transactions may use separate messages to authorize and clear a given transaction. This report categorizes each network based on the primary type of messaging that is used for the transactions that it processes.

Appendix: Tables

Table 1. Purchase transactions, 2021

Transactions	Number (billions)	Value (\$ billions)	Average (\$)
All transactions	92.11	4,260.60	46.26
Non-prepaid debit card	84.44	3,952.52	46.81
Prepaid card ¹	7.43	297.44	40.03
Dual-message networks	62.82	3,000.43	47.76
Non-prepaid debit card	57.45	2,779.83	48.39
Prepaid card	5.37	220.60	41.08
Single-message networks	29.29	1,260.17	43.02
Non-prepaid debit card	26.99	1,172.69	0.74
Prepaid card	2.06	76.83	37.29

¹ The distribution of prepaid card transactions between dual-message and single-message networks in 2009 is estimated based on 2011 proportions.

Table 2. Card-present and card-not-present transactions, 2021

Transactions ¹	Number (billions)	Value (\$ billions)	Average (\$)
All transactions²	92.11	4,260.60	46.26
Card-present	62.57	2,355.12	37.64
Card-not-present	29.54	1,905.48	64.50
Dual-message networks ²	62.82	3,000.43	47.76
Card-present	35.07	1,179.80	33.64
Card-not-present	27.75	1,820.63	65.61
Single-message networks ²	29.29	1,260.17	43.02
Card-present	27.50	1,175.32	42.74
Card-not-present	1.79	84.85	47.31

¹ The distribution of prepaid card transactions between dual-message and single-message networks in 2009 is estimated based on 2011 proportions.

² Prepaid card transactions are included under all transactions and under both dual-message and single-message networks.

Table 3. Covered and exempt debit card transactions, 2021

Transactions	Number (billions)	Value (\$ billions)	Average (\$)
All transactions	92.11	4,260.60	46.26
Covered transactions	56.19	2,698.37	48.02
Non-prepaid	56.11	2,695.35	48.04
Prepaid	0.08	3.02	36.15
Exempt transactions	35.92	1,562.23	43.49
Non-prepaid	28.57	1,267.80	44.37
Prepaid	7.35	294.42	40.07
Covered issuer	2.49	112.65	45.33
Exempt issuer	4.86	181.77	37.38
Dual-message networks	62.82	3,000.43	47.76
Covered transactions	38.59	1,905.70	49.39
Non-prepaid	38.51	1,903.15	49.41
Prepaid	0.07	2.55	35.05
Exempt transactions	24.23	1,094.73	45.18
Non-prepaid	18.93	876.68	46.31
Prepaid	5.30	218.05	41.16
Covered issuer	1.91	88.19	46.28
Exempt issuer	3.39	129.86	38.28
Single-message networks	29.29	1,260.17	43.02
Covered transactions	17.60	792.67	45.03
Non-prepaid	17.59	792.20	45.03
Prepaid	0.01	0.46	43.66
Exempt transactions	11.69	467.50	39.99
Non-prepaid	9.64	391.13	40.58
Prepaid	2.05	76.37	37.26
Covered issuer	0.58	24.47	42.21
Exempt issuer	1.47	51.91	35.31

Table 4. Interchange fee revenue, 2021

Transactions	Interchange fee revenue (\$ billions)	Fee per transaction (\$) ¹	Fee as percent of transaction value ¹
All transactions	31.59	0.34	0.74
Non-prepaid debit card	27.14	0.32	0.69
Prepaid card ²	4.40	0.59	1.48
Dual-message networks	24.20	0.39	0.81
Non-prepaid debit card	20.43	0.36	0.74
Prepaid card	3.77	0.70	1.71
Single-message networks	7.39	0.25	0.59
Non-prepaid debit card	6.70	0.25	0.57
Prepaid card	0.63	0.31	0.82

¹ Interchange fee revenue is divided by the number or value of purchase transactions. For 2009, interchange fee revenue is divided by the number of value of purchase transactions net of returns.

² The distribution of interchange fee revenue from prepaid card transactions between dual-message and single-message networks in 2009 is estimated based on 2011 proportions.

Table 5. Interchange fee revenue from covered and exempt debit card transactions, 2021

Transactions	Interchange fee revenue (\$ billions)	Fee per transaction (\$) ¹	Fee as percent of transaction value ¹
All transactions	31.59	0.34	0.74
Covered transactions	12.93	0.23	0.48
Non-prepaid	12.91	0.23	0.48
Prepaid	0.02	0.23	0.63
Exempt transactions	18.67	0.52	1.19
Non-prepaid	14.29	0.50	1.13
Prepaid	4.38	0.60	1.49
Covered issuer	1.58	0.64	1.40
Exempt issuer	2.80	0.58	1.54
Dual-message networks	24.20	0.39	0.81
Covered transactions	8.70	0.23	0.46
Non-prepaid	8.68	0.23	0.46
Prepaid	0.02	0.22	0.64
Exempt transactions	15.50	0.64	1.42
Non-prepaid	11.75	0.62	1.34
Prepaid	3.75	0.71	1.72
Covered issuer	1.41	0.74	1.60
Exempt issuer	2.34	0.69	1.80
Single-message networks	7.39	0.25	0.59
Covered transactions	4.23	0.24	0.53
Non-prepaid	4.23	0.24	0.53
Prepaid	0.00	0.24	0.55
Exempt transactions	3.16	0.27	0.68
Non-prepaid	2.53	0.26	0.65
Prepaid	0.63	0.31	0.82
Covered issuer	0.17	0.29	0.69
Exempt issuer	0.46	0.31	0.88

¹ Interchange fee revenue is divided by the number or value of purchase transactions.

Table 6. Payments and incentives paid by networks, 2021

Recipients	Payments and incentives (\$ billions)	Payment per transaction (\$) ¹	Payment as percent of transaction value ¹
All recipients	4.46	0.048	0.10
Paid to merchants/acquirers	2.70	0.029	0.06
Paid to issuers	1.76	0.019	0.04
Dual-message networks ²	3.85	0.061	0.13
Paid to merchants/acquirers	2.22	0.035	0.07
Paid to issuers	1.63	0.026	0.05
Single-message networks	0.61	0.021	0.05
Paid to merchants/acquirers	0.49	0.017	0.04
Paid to issuers	0.12	0.004	0.01

¹ Payments and incentives are divided by the number or value of purchase transactions.

² For 2009, payments and incentives are divided by the number or value of purchase transactions plus returns. The distribution of payments and incentives paid on prepaid card transactions between dual-message and single-message networks in 2009 is estimated based on 2011 proportions.

Table 7. Payments and incentives paid to issuers by networks, 2021

Issuers	Payments and incentives (\$ billions)	Payment per transaction (\$) ¹	Payment as percent of transaction value ¹
All issuers	1.76	0.019	0.041
Covered issuers	0.77	0.013	0.027
Exempt issuers	0.99	0.030	0.068
Dual-message networks	1.63	0.026	0.054
Covered issuers	0.73	0.018	0.037
Exempt issuers	0.90	0.040	0.089
Single-message networks	0.12	0.004	0.010
Covered issuers	0.03	0.002	0.004
Exempt issuers	0.09	0.008	0.021

¹ Payments and incentives are divided by the number or value of purchase transactions.

Table 8. Network fees, 2021

Recipients	Network fee payments (\$ billions)	Fee per transaction (\$) ¹	Fee as percent of transaction value ¹
All recipients	11.49	0.125	0.27
Paid by acquirers	7.34	0.080	0.17
Paid by issuers	4.15	0.050	0.10
Dual-message networks ²	9.60	0.153	0.32
Paid by acquirers	6.05	0.096	0.20
Paid by issuers	3.55	0.057	0.12
Single-message networks	1.89	0.065	0.15
Paid by acquirers	1.30	0.044	0.10
Paid by issuers	0.60	0.020	0.05

¹ Network fees are divided by the number or value of purchase transactions.

² For 2009, network fees are divided by the number or value of purchase transactions plus returns. The distribution of network fees paid on prepaid card transactions between dual-message and single-message networks in 2009 is estimated based on 2011 proportions.

Table 9. Network fees paid by issuers, 2021

Issuers	Network fee payments (\$ billions)	Fee per transaction (\$) ¹	Fee as percent of transaction value ¹
All issuers	4.15	0.045	0.10
Covered issuers	1.03	0.017	0.04
Exempt issuers	3.12	0.093	0.22
Dual-message networks	3.55	0.057	0.12
Covered issuers	0.92	0.023	0.05
Exempt issuers	2.63	0.118	0.26
Single-message networks	0.60	0.020	0.05
Covered issuers	0.10	0.006	0.01
Exempt issuers	0.49	0.045	0.11

¹ Network fees are divided by the number or value of purchase transactions.

Table 10. Fraudulent debit card activity, 2021		
Transactions	Fraud as percent of purchase transactions ¹	Average loss per fraudulent transaction (\$) ²
All transactions	0.108	76
Card-not-present fraud	0.069	58
Counterfeit fraud	0.021	70
Lost and stolen fraud	0.010	202
Other fraud	0.005	108
Dual-message debit transactions ³	0.130	66
Card-not-present fraud	0.089	64
Counterfeit fraud	0.027	62
Lost and stolen fraud	0.010	84
Other fraud	0.003	88
Single-message debit transactions ⁴	0.016	123
Card-not-present fraud	0.004	78
Counterfeit fraud	0.005	131
Lost and stolen fraud	0.004	147
Other fraud	0.001	177
Prepaid transactions	0.748	117
Card-not-present fraud	0.439	26
Counterfeit fraud	0.104	92
Lost and stolen fraud	0.113	491
Other fraud	0.092	144
¹ Number of fraudulent transactions divided by the total number of purchase transactions. ² Total fraud losses to all parties (merchants, cardholders, and issuers) divided by the number of fraudulent transactions. ³ Dual-message debit transactions are transactions initiated with non-prepaid debit cards processed over dual-message networks. ⁴ Single-message debit transactions are transactions initiated with non-prepaid debit cards processed over single-message networks.		

Table 11. 2021 fraud losses reported by covered issuers

Transactions	All fraud ¹		Card-not-present fraud ²		Counterfeit fraud		Lost and stolen fraud	
	Loss per transaction (\$) ³	Loss as share of transaction value (bp) ⁴	Loss per transaction (\$) ³	Loss as share of transaction value (bp) ⁴	Loss per transaction (\$) ³	Loss as share of transaction value (bp) ⁴	Loss per transaction (\$) ³	Loss as share of transaction value (bp) ⁴
All transactions	0.083	17.45	0.041	8.58	0.016	3.39	0.022	4.63
Merchant losses	0.039	8.17	0.018	3.82	0.006	1.15	0.002	0.35
Cardholder losses	0.016	3.39	0.004	0.73	0.003	0.56	0.002	0.32
Issuer losses	0.028	5.83	0.007	1.37	0.002	0.50	0.003	0.59
Dual-message debit transactions ⁵	0.086	17.49	0.057	11.64	0.017	3.56	0.009	1.76
Merchant losses	0.053	10.82	0.040	8.15	0.011	2.22	0.004	0.71
Cardholder losses	0.010	2.04	0.005	1.04	0.003	0.62	0.002	0.35
Issuer losses	0.019	3.87	0.011	2.20	0.003	0.68	0.003	0.66
Single-message debit transactions ⁶	0.019	4.22	0.004	0.76	0.007	1.54	0.007	1.47
Merchant losses	0.006	1.32	0.002	0.33	0.002	0.44	0.002	0.42
Cardholder losses	0.005	1.01	0.001	0.17	0.002	0.49	0.001	0.31
Issuer losses	0.008	1.80	0.001	0.26	0.003	0.58	0.003	0.73
Prepaid transactions	0.834	222.09	0.150	39.36	0.128	33.39	0.745	195.13
Merchant losses	0.047	12.56	0.002	0.58	0.002	0.44	<0.001	0.07
Cardholder losses	0.311	82.82	<0.001	0.05	0.001	0.16	<0.001	0.05
Issuer losses	0.475	126.69	0.001	0.34	0.001	0.19	0.001	0.18

Note: Statistics exclude responses in which the issuer reported issuer fraud losses but was unable to report gross fraud losses. Therefore, statistics may differ from those in table 14, which include responses in which the issuer was able to report only issuer fraud losses.

¹ Card-not-present, counterfeit, and lost and stolen fraud losses do not necessarily sum to all fraud losses. Some fraud losses could not be categorized by issuers into the categories above but are still included under all fraud losses.

² Card-not-present fraud losses may also be reported in another second category.

³ Fraud losses divided by the number of purchase transactions (both fraudulent and non-fraudulent).

⁴ Fraud losses divided by the value of purchase transactions (both fraudulent and non-fraudulent).

⁵ Dual-message transactions are transactions initiated by non-prepaid debit cards over dual-message networks.

⁶ Single-message transactions are transactions initiated by non-prepaid debit cards over single-message networks.

Table 12. Covered issuers by 2021 volume

Issuers	Number of covered issuers	Percent of transaction value ¹	Average transaction value (\$) ¹
All covered issuers	163	100.00	47.67
High-volume issuers	53	93.86	47.44
Mid-volume issuers	86	6.13	51.49
Low-volume issuers	24	0.01	78.47

Note: High-volume issuers are issuers that report more than 100 million transactions. Mid-volume issuers are issuers that report between 1 and 100 million transactions. Low-volume issuers are issuers that report less than 1 million transactions.

¹ Average transaction values in this table are calculated from the Debit Card Issuer survey. Average transaction values reported in tables 1–3 are calculated from the Payment Card Network survey.

Table 13. Average authorization, clearing, and settlement (ACS) costs (excluding issuer fraud losses) per transaction (dollars), 2021

Transactions	All covered issuers	High-volume issuers	Mid-volume issuers	Low-volume issuers
All issuers¹				
All transactions²	0.039	0.035	0.109	0.595
Dual-message debit transactions ²	0.039	0.037	0.101	0.363
Single-message debit transactions ²	0.025	0.023	0.089	0.911
Prepaid transactions ^{2, 3}	0.082	0.082	0.353	
<i>Only issuers providing cost breakdown¹</i>				
All transactions²	0.036	0.033	0.083	0.507
In-house costs	0.016	0.017	0.007	0.141
Third-party processing fees	0.010	0.008	0.037	0.261
Network fees	0.008	0.006	0.046	0.097
Dual-message debit transactions ^{2,3}	0.037	0.036	0.072	0.321
In-house costs	0.020	0.020	0.009	0.007
Third-party processing fees	0.008	0.007	0.028	0.269
Network fees	0.007	0.006	0.047	0.057
Single-message debit transactions ^{2,3}	0.022	0.021	0.051	0.630
In-house costs	0.009	0.009	0.006	0.088
Third-party processing fees	0.007	0.007	0.024	0.610
Network fees	0.006	0.005	0.045	0.120
Prepaid transactions ^{2,3}	0.079	0.079	0.035	
In-house costs	0.026	0.026	0.005	
Third-party processing fees	0.035	0.035	0.238	
Network fees	0.012	0.012	0.105	
<p>¹ First set of rows in table reports statistics from transactions processed by all covered issuers, regardless of the level of detail in their cost reporting. Second set of rows reports statistics from transactions including only those issuers that provided a breakdown of their costs by category.</p> <p>² ACS costs include transactions monitoring costs. However, transactions monitoring costs are not included in the breakout into in-house costs and third-party processing fees.</p> <p>³ Prepaid figures for low-volume issuers, as well as the breakdown by cost category among low-volume issuers for dual-message, single-message, and prepaid transactions, are not reported because of the small number of respondents.</p>				

Table 14A. 2021 Covered issuer costs per transaction (\$) and fraud losses as share of transaction value (basis points)

Transactions	All covered issuers					High-volume issuers				
	Transaction-weighted average	Issuer-weighted average	Issuer percentiles			Transaction-weighted average	Issuer-weighted average	Issuer percentiles		
			25th	50th	75th			25th	50th	75th
All transactions										
ACS costs, excluding fraud losses ¹	0.039	2.148	0.053	0.102	0.176	0.035	0.056	0.029	0.042	0.078
Fraud-prevention costs ²	0.022	0.082	0.006	0.013	0.034	0.022	0.017	0.006	0.011	0.020
Cardholder inquiry costs ³	0.030	0.037	0.001	0.008	0.027	0.030	0.017	0.003	0.013	0.026
Reward program costs	0.001	0.004	–	–	–	0.001	0.001	–	–	–
NSF handling costs ⁴	0.005	0.003	–	–	0.002	0.005	0.005	<0.001	0.002	0.006
Issuer fraud losses	0.028	0.053	0.012	0.020	0.036	0.027	0.017	0.011	0.017	0.021
<i>Dual-message debit transactions⁵</i>										
ACS costs, excluding fraud losses ¹	0.039	0.576	0.037	0.076	0.166	0.037	0.060	0.029	0.042	0.079
Fraud-prevention costs ²	0.020	0.073	0.006	0.014	0.044	0.019	0.019	0.006	0.012	0.024
Cardholder inquiry costs ³	0.025	0.031	0.001	0.009	0.028	0.025	0.016	0.004	0.013	0.026
Reward program costs	0.001	0.004	–	–	–	0.001	<0.001	–	–	–
NSF handling costs ⁴	0.006	0.003	–	<0.001	0.003	0.006	0.005	0.001	0.002	0.007
Issuer fraud losses	0.020	0.055	0.014	0.024	0.036	0.019	0.022	0.015	0.021	0.028
<i>Single-message debit transactions⁶</i>										
ACS costs, excluding fraud losses ¹	0.025	0.700	0.025	0.059	0.153	0.023	0.044	0.022	0.028	0.063
Fraud-prevention costs ²	0.019	0.090	0.005	0.012	0.038	0.019	0.015	0.005	0.010	0.018
Cardholder inquiry costs ³	0.026	0.032	0.001	0.009	0.029	0.026	0.016	0.004	0.012	0.023
Reward program costs	0.001	0.006	–	–	–	0.001	0.001	–	–	–
NSF handling costs ⁴	0.004	0.002	–	–	0.002	0.004	0.004	<0.001	0.002	0.005
Issuer fraud losses	0.009	0.028	0.003	0.009	0.018	0.008	0.009	0.003	0.007	0.012
<i>Prepaid transactions⁷</i>										
ACS costs, excluding fraud losses ¹	0.082	33.289	0.031	0.098	0.268	0.082	0.363	0.031	0.077	0.140
Fraud-prevention costs ²	0.162	0.043	0.004	0.014	0.044	0.162	0.051	0.003	0.011	0.060
Cardholder inquiry costs ³	0.201	1.965	0.005	0.029	0.138	0.202	0.090	0.010	0.029	0.124
Reward program costs	<0.001	<0.001	–	–	–	<0.001	<0.001	–	–	–
NSF handling costs ⁴	<0.001	0.002	–	–	0.001	<0.001	0.002	–	–	0.002
Issuer fraud losses	0.477	0.072	0.001	0.018	0.038	0.484	0.095	0.004	0.020	0.042
Covered issuer fraud losses (bp)⁸	5.83	7.51	2.61	3.99	6.46	5.78	3.71	2.63	3.48	4.62
Dual-message debit transactions ⁵	4.08	7.82	2.73	4.40	7.04	3.90	4.47	3.14	4.30	5.66
Single-message debit transactions ⁶	1.87	4.52	0.61	1.76	3.51	1.79	1.97	0.61	1.49	2.39
Prepaid transactions ⁷	126.82	18.37	0.18	3.95	10.06	132.55	24.69	1.27	5.50	10.92

¹ Authorization, clearing, and settlement costs include transactions monitoring costs and exclude issuer fraud losses, which are reported separately.

² Fraud-prevention costs include fraud-related cardholder inquiry costs and exclude transactions monitoring costs, which are counted as part of ACS costs.

³ Cardholder inquiry costs exclude fraud-related cardholder inquiry costs, which are counted as part of fraud-prevention costs.

⁴ Non-sufficient funds (NSF) handling costs.

⁵ Dual-message debit transactions are transactions initiated with non-prepaid debit cards processed over dual-message networks.

⁶ Single-message debit transactions are transactions initiated with non-prepaid debit cards processed over single-message networks.

⁷ Prepaid figures for low-volume issuers are not reported because of the small number of respondents in this category.

⁸ Covered issuer fraud losses for all transactions include covered issuers that could not allocate fraud losses among dual-message debit, single-message debit, and prepaid transactions.

Table 14B. 2021 Covered issuer costs per transaction (\$) and fraud losses as share of transaction value (basis points)

Transactions	Mid-volume issuers					Low-volume issuers				
	Transaction-weighted average	Issuer-weighted average	Issuer percentiles			Transaction-weighted average	Issuer-weighted average	Issuer percentiles		
			25th	50th	75th			25th	50th	75th
All transactions										
ACS costs, excluding fraud losses ¹	0.109	0.151	0.072	0.113	0.169	0.595	14.161	0.519	1.350	2.029
Fraud-prevention costs ²	0.023	0.040	0.005	0.013	0.033	0.124	0.404	0.014	0.088	0.459
Cardholder inquiry costs ³	0.025	0.040	0.002	0.007	0.031	0.011	0.072	–	–	0.010
Reward program costs	0.008	0.009	–	–	–	–	–	–	–	–
NSF handling costs ⁴	0.002	0.002	–	–	<0.001	–	–	–	–	–
Issuer fraud losses	0.034	0.044	0.018	0.026	0.052	0.075	0.165	<0.001	0.007	0.078
<i>Dual-message debit transactions⁵</i>										
ACS costs, excluding fraud losses ¹	0.093	0.135	0.058	0.105	0.187	0.363	5.836	0.205	0.793	1.796
Fraud-prevention costs ²	0.039	0.066	0.005	0.014	0.046	0.123	0.334	0.018	0.103	0.156
Cardholder inquiry costs ³	0.027	0.057	0.002	0.009	0.043	0.002	0.008	–	–	–
Reward program costs	0.010	0.009	–	–	–	–	–	–	–	–
NSF handling costs ⁴	0.003	0.003	–	–	0.001	–	–	–	–	–
Issuer fraud losses	0.051	0.055	0.020	0.035	0.065	0.022	0.159	–	<0.001	0.005
<i>Single-message debit transactions⁶</i>										
ACS costs, excluding fraud losses ¹	0.089	0.128	0.053	0.086	0.185	<0.001	5.540	0.454	0.988	1.822
Fraud-prevention costs ²	0.040	0.090	0.007	0.023	0.055	0.095	0.383	<0.001	0.052	0.146
Cardholder inquiry costs ³	0.031	0.059	0.002	0.009	0.037	0.020	0.012	–	–	0.013
Reward program costs	0.012	0.013	–	–	–	–	–	–	–	–
NSF handling costs ⁴	0.001	0.001	–	–	<0.001	–	–	–	–	–
Issuer fraud losses	0.024	0.039	0.006	0.015	0.038	0.018	0.048	–	<0.001	0.019
<i>Prepaid transactions⁷</i>										
ACS costs, excluding fraud losses ¹	0.353	132.070	0.104	0.264	3.214					
Fraud-prevention costs ²	0.040	0.019	0.010	0.016	0.023					
Cardholder inquiry costs ³	0.009	8.996	0.001	0.075	9.070					
Reward program costs	–	–	–	–	–					
NSF handling costs ⁴	–	–	–	–	–					
Issuer fraud losses	0.019	0.028	–	0.009	0.022					
Covered issuer fraud losses (bp)⁸	6.65	7.24	3.02	4.77	7.76	9.69	16.95	<0.01	1.40	7.98
Dual-message debit transactions ⁵	9.52	9.30	3.42	6.09	9.16	2.62	13.28	–	0.01	0.66
Single-message debit transactions ⁶	4.86	6.88	1.34	3.11	6.25	2.75	4.92	–	0.02	3.13
Prepaid transactions ⁷	1.59	6.51	–	0.81	6.42					

¹ Authorization, clearing, and settlement costs include transactions monitoring costs and exclude issuer fraud losses, which are reported separately.

² Fraud-prevention costs include fraud-related cardholder inquiry costs and exclude transactions monitoring costs, which are counted as part of ACS costs.

³ Cardholder inquiry costs exclude fraud-related cardholder inquiry costs, which are counted as part of fraud-prevention costs.

⁴ Non-sufficient funds (NSF) handling costs.

⁵ Dual-message debit transactions are transactions initiated with non-prepaid debit cards processed over dual-message networks.

⁶ Single-message debit transactions are transactions initiated with non-prepaid debit cards processed over single-message networks.

⁷ Prepaid figures for low-volume issuers are not reported because of the small number of respondents in this category.

⁸ Covered issuer fraud losses for all transactions include covered issuers that could not allocate fraud losses among dual-message debit, single-message debit, and prepaid transactions.

Table 15. Covered issuers with costs/losses below the levels permitted by the interchange fee standard and fraud-prevention adjustment, 2021

Issuers	Percent of covered issuers ¹	Percent of transactions represented ²
All covered issuers		
Total maximum interchange fee ³	75.9	99.5
Interchange fee standard ⁴	77.4	99.5
Fraud-prevention adjustment ⁵	42.1	34.8
<i>High-volume issuers</i>		
Total maximum interchange fee ³	100.0	100.0
Interchange fee standard ⁴	100.0	100.0
Fraud-prevention adjustment ⁵	45.8	33.7
<i>Mid-volume issuers</i>		
Total maximum interchange fee ³	76.8	89.3
Interchange fee standard ⁴	78.3	90.5
Fraud-prevention adjustment ⁵	45.2	55.3
<i>Low-volume issuers</i>		
Total maximum interchange fee ³	15.8	47.3
Interchange fee standard ⁴	21.1	49.2
Fraud-prevention adjustment ⁵	21.1	18.1
<p>¹ Percentage of covered issuers in the relevant category with average ACS costs, including issuer fraud losses, and fraud-prevention costs below the level permitted by the interchange fee standard and the fraud-prevention adjustment. All covered issuers are included, but some of these issuers may not have been eligible for the fraud-prevention adjustment.</p> <p>² Percentage of purchase transactions represented by covered issuers in the relevant category with average ACS costs, including fraud losses, and fraud-prevention costs below the level permitted by the interchange fee standard and the fraud-prevention adjustment. All covered issuer transactions are included although certain prepaid transactions were exempt from the interchange fee standard.</p> <p>³ Average ACS costs, including issuer fraud losses, plus fraud-prevention costs per transaction of 22 cents plus 5 basis points of the issuer's average transaction value or less.</p> <p>⁴ Average ACS costs, including issuer fraud losses, per transaction of 21 cents plus 5 basis points of the issuer's average transaction value or less.</p> <p>⁵ Average fraud-prevention costs per transaction of 1 cent or less.</p>		

Find other Federal Reserve Board publications (www.federalreserve.gov/publications.htm) or order those offered in print (www.federalreserve.gov/files/orderform.pdf) on our website. Also visit the site for more information about the Board and to learn how to stay connected with us on social media.



www.federalreserve.gov