The Federal Reserve System houses extensive payments expertise in research and policy groups across Reserve Banks and the Board of Governors. Researchers and analysts across the system have produced studies on a wide range of payments-related topics. Below we provide brief summaries of select recent research.

Payments Security

The U.S. Adoption of Computer-Chip Payment Cards: Implications for Payment Fraud
Federal Reserve Bank of Kansas City; Q1 2013

Richard Sullivan describes differences between magnetic-stripe cards and yet-to-be-adopted in the U.S. EMV technology, explaining EMV's security advantages in combating current fraud techniques. He outlines EMV adoption experiences and the resulting fraud impact in France, the Netherlands, and the UK. In these countries, adopting EMV led fraud to decline in card-present transactions where EMV or chip-and-PIN were used, and shift to less-secure types of transactions such as magnetic-stripe cards, and internet, mail order and telephone order (IMOTO) transactions. Together, the combination of chip cards, the use of dynamic authentication data, and improved authentication for IMOTO transactions led to significant declines in fraud in several of the SEPA countries. Based on this experience, Sullivan predicts that the transition to EMV cards could reduce fraud rates in the U.S. by 40%, but will drive fraudsters to transactions with less secure authentication protocols until magnetic strips are eliminated altogether and stronger authentication protocols are the norm. He argues that the U.S. needs to collect comprehensive fraud data to better combat new types of fraud in the future.

Security of Retail Payments: the New Strategic Objective
Federal Reserve Bank of Boston, Consumer Payments Research Center; November 2013

Joanna Stavins evaluates results of the Boston Fed's annual Survey of Consumer Payment Choice, analyzing how consumers perceive the security of various payment instruments and how that perception impacts actual consumer behavior. She concludes that consumers' assessment of payments risks vary and do not appear to be solid predictors of use across all payment options. Consumers generally think about payment security categorically rather than by payment instrument, such as making no distinction between online bill pay and bank account number payments. Once consumers adopt a new category of payments, their security beliefs do not tend to influence frequency of use. However, security concerns do tend to affect frequency of use for well-established payment methods such as cash and credit cards. The author evaluates consumer risk ratings of nine payment instruments and provides a policy simulation to consider how the Federal Reserve's strategic objective of maintaining public confidence and security in the payments system might impact consumer behavior, concluding that security improvements might have little impact on consumer choice.

Consumer Choice

From Mail to Mobile—A New Generation in Payments
Federal Reserve Bank of Richmond; March 2014

Scarlett Schwartz and Ann Ramage examine data from the Federal Reserve 2012 Diary of Consumer Payment Choice, finding that older and younger generations make different payment choices for day-to-day purchases. For example, they found that mail order services were used by 32.4% of the Silent Generation (born before 1945) but only 3.5% of Generation Y (born after 1980). On the other end of the spectrum, online and mobile payments were used much more often by younger generations. Cash was the most common payment type for all age groups, being used for more than

40% of daily purchases, typically low-value items. Debit cards were the second most common payment instrument for younger generations, but the Silent Generation still used credit cards more frequently than debit cards.

Cash Continues to Play a Key Role in Consumer Spending: Evidence from the Diary of Consumer Payment Choice
Federal Reserve Bank of San Francisco; April 2014

The authors use data from the 2012 Diary of Consumer Payment Choice to show that unlike checks, consumers view cash as a key instrument that cannot easily be replaced by electronic forms of payment. For the individuals surveyed, cash was the most frequently used payment type accounting for 40% of transactions. Consumers used cash more frequently than debit cards, with cash accounting for 2/3 of payments less than $10. Debit cards were used much like cash for low-value categories of items such as food and personal care. Cash was by far the most frequently used payment instrument for P2P transfers of any value, since debit cards were not an easy substitute for these types of transactions. A preference for cash was just as common in younger age groups as older age groups. Lower income households spent much more cash than any other income group per month.

Payment Choice and the Future of Currency: Evidence from 2 Billion Retail Transactions
Federal Reserve Bank of Richmond; May 2014

Zhu Wang and Alexander Wolman analyze transaction data from a national discount retail chain, tracking roughly 2 billion payments from millions of consumers across the country over the course of 3 years. Since most of these transaction values are small, with a median of $7, they are able to closely examine patterns in cash and debit card use. They include zipcode-level demographic data in their model to compare trends across region, finding that areas with many bank branches and high minority populations tend to use cash most often. In contrast, relatively well-off areas and areas with high crime rates have lower cash use. On the state level, it seems that cash and debit cards can substitute for each other: states with the highest cash use have relatively low debit card use, and states with highest debit card use have relatively low cash use. They also find a strong fluctuation in cash use over the course of a week, with the highest number of cash transactions on Mondays and Saturdays. Although cash will remain a key payment instrument for low-value transactions in the future, they predict that the share of transactions using cash will continue to decline by about 2.54 percentage points per year.

The Merchant’s View

Mobile Payments: Merchants' Perspectives
Federal Reserve Bank of Kansas City; Q2 2014

Fumiko Hayashi and Terri Bradford interviewed 20 large and mid-size merchants about the costs and benefits associated with different types of mobile payments. They find most merchants are optimistic that mobile commerce and payments technology could improve the customer shopping experience by providing quicker checkout, tailored coupons, and better loyalty programs. Merchants are unsure of how mobile technology will affect their costs, especially since it is not clear which mobile technologies they will choose to adopt. Adopting QR code and cloud technology would require fewer expensive infrastructure investments and could help steer customers away from card transactions and their related fees. However, if NFC (near field communication) becomes the dominant technology, it would require new infrastructure and may increase card processing costs. Merchants see a possible opportunity for mobile payments to provide better customer data, but are concerned that data ownership and security standards are often unclear across different mobile products. Merchants are also concerned about the current fragmented market, which increases their uncertainty about how to invest in mobile products to best meet their customers’ needs.

Merchant Steering of Consumer Payment Choice: Evidence from a 2012 Diary Survey
Federal Reserve Bank of Boston, Consumer Payments Research Center; May 2014

Oz Shy and Joanna Stavins analyze data from the 2012 Diary of Consumer Payment Choice, finding that merchants are still not widely employing discounts for cash transactions or surcharges for credit card transactions to steer consumer choice of payment methods. Gas stations have traditionally used similar pricing conventions, and they continue to be the category most likely to offer cash discounts and to use price differentials as a way to incent customers to opt for cash transactions to minimize fees associated with card networks. Through a recent court ruling (July 2012) in the Eastern District Court of New York, Visa and MasterCard are required to allow merchants to pass on card transaction fees to consumers as surcharges, a practice previously prohibited in network contracts. This paper shows that other merchant categories beyond auto and vehicle related commerce have yet to do so, but the authors acknowledge there will likely be a period of transition for additional types of merchants to exercise this freedom.

Payments Innovation

Millennials with Money: A New Look at Who Uses GPR Prepaid Cards
Federal Reserve Bank of Philadelphia; September 2014

Susan Herbst-Murphy and Greg Weed use survey datasets collected by Phoenix Marketing International in 2012 and 2013 to look at characteristics of general purpose reloadable (GPR) prepaid card users. They find that between 2012 and 2013 the proportion of households that reported using GPR cards rose from roughly 1/5 to 1/4, and the biggest increase came from young consumers with relatively high incomes. The best predictor of GPR card ownership was age: almost half (45%) of households headed by Millennials age 18-32 owned a GPR card in 2013, as well as 35% of Generation X households (33-48), while older groups had much lower ownership rates. Although GPR cards were originally targeted to lower-income and underbanked segments of the population, GPR cards have become common among all income levels, even among consumers who also use traditional bank services. High-income Millennial and Generation X cohorts making over $50K were identified as “power users” with both high adoption of GPR cards and high monthly spending and reload rates.

Bitcoin: A Primer

Federal Reserve Bank of Chicago; December 2013

Bitcoin remains a topic of significant interest in the payments world and this Chicago Fed Letter describes and summarizes the features, creation, and exchange of the virtual currency which has grown in circulation and value since it was introduced in 2009. Francois Velde considers how effectively the currency satisfies requirements and expectations as a medium of exchange, and highlights its vulnerabilities including speed of enacting a transaction, complexity required in validating and settling a transaction, and lack of protection by the state.

Payments Regulation and System Oversight

The New Debit Card Regulations: Effects on Merchants, Consumers, and Payment Systems
Federal Reserve Bank of Kansas City; Q1 2013

Fumiko Hayashi examines the potential impact of the Durbin amendment on merchants, consumers, and the broader payments network. As a result of the new regulations, debit fees have declined for most types of merchants. However, merchants that previously paid the highest fees to compensate for high risk levels, such as hotels and e-merchants, have benefited far more than others. On the other end of the spectrum, some quick service merchants have actually seen their debit fees increase on average, since they faced a low fee schedule before Durbin. In addition, many large chain stores no longer receive volume discounts from regulated banks. Merchants have also benefitted differently depending on whether they have a majority of signature or PIN transactions: debit fees have decreased more for signature than for PIN transactions, but merchants now have greater control over routing between PIN debit networks. The impact on consumers and the payment system at large has been less direct, and it is still unclear whether consumers will benefit overall. Merchants are likely to pass on at least some of their cost-savings, but banks are also likely to pass on their losses through new fees or product changes. If these actions lead consumers to switch from debit cards to less-efficient payment methods such as credit cards and checks, society as a whole will be worse off.

Costs and Benefits of Replacing the $1 Federal Reserve Note with a $1 U.S. Coin

Federal Reserve Board of Governors; December 2013

A 2011 GAO report suggested a savings to the U.S. government if $1 coins replaced $1 paper currency. This paper analyzes the costs and benefits of this proposal, concluding that a complete or partial coin-to-currency replacement would actually come at greater costs to most payments participants. Current barriers to acceptance of the $1 coin already in circulation center on the “network effect,” or lack of broad acceptance by consumers and merchants. Lack of demand for coins has resulted in a 40 year supply of coins at Reserve Banks. Based on this aversion to coins the authors predict a complete transition to coin would shift consumers to substitute other payment instruments to avoid carrying coins. The $1 paper note has a historical high circulation life of 70 months, since the material used to print bills and the technology in place to assess currency fitness allow the government to keep a high number of bills in circulation. Additionally, counterfeit screening for bills is more extensive than both current equipment and expertise would allow for coin screening. The authors conclude transition to the $1 coin carries significant costs and risks to the government and payment system participants alike.