

The Evolution of Payments in the U.S.: Paper vs. Electronic

Presented by Anthony M. Santomero, President
Federal Reserve Bank of Philadelphia

Pennsylvania Association of Community Bankers
128th Annual Convention
Fairmont Banff Springs, Banff, Alberta, Canada
September 10, 2005

The tide is turning in our nation's payments system. We have known this for quite some time, but hard evidence came last December in the form of the 2004 Federal Reserve Payments Study. It asserted that electronic payments, for the first time ever, had trumped the paper check in terms of transactions. It appears our nation's pattern of payments is finally evolving — some might say it is experiencing a radical change — from one based on paper checks to one based on electronics.

This evolution is significant, both to you as commercial bankers and to me as a central banker. From your perspective, payments represent up to 40 percent of all banking income¹ — making this issue one of fair importance to say the least.

From my perspective, it has two separate but important impacts. From its inception, the Federal Reserve has had a dual role as the central bank. It is charged with ensuring the integrity of the payments system and it is a participant in its evolution. The financial stability concerns associated with a change in the payments structure are obvious. As systems change there are always risks, and we at the Fed need to be watchful. But in addition to this, the Federal Reserve is also a financial service provider. We have been a vital part of the retail payments system since our founding over 90 years ago. Changes in the payments structure have had, and will continue to have, profound effects on our physical infrastructure. It is expected that the Fed's paper processing role will diminish as checks recede in both absolute volume and relative importance in the retail payments system. In the interim, however, the changes taking place in payments patterns are causing us to adapt and adjust to the market's evolution.

In today's remarks, I will share with you how this transformation is taking place, my own views on where this evolution might end up, and the likely place of the Federal Reserve in the payments system of the future.

To begin, what do we presently know about the current payments structure? According to the Fed's most recent study, only about 45 percent of all U.S. noncash retail payments are made by paper check, with payment cards and ACH accounting for the remainder of retail payments. And at current growth rates, credit cards and debit cards will both individually surpass the paper check in terms of total annual transactions by 2007.

This is quite a change! The once dominant check is finally giving way to electronics in the U.S. payments system. "Why did it take so long?" some might ask. History is part of the answer. As is typical in many areas of financial infrastructure, change has been, and will continue to be, affected by our financial history and its legacy systems. So to understand the future, let us start by looking into our past.

The History of Payments in the U.S.

Historically, U.S. banks tended to provide services — including payments services — to the broad spectrum of people and businesses. On the loan side, commercial banks focused on commercial and industrial lending, but they took deposit balances from all economic strata.

In early America, the geographical expanse of the country encouraged a fragmented system where state banks issued their own notes. Entry into the banking business was relatively easy, but bank branching was very restricted. Banks were prohibited from branching outside their home state, and in many states, branching was restricted still further. As a consequence, a region would be served by a relatively large number of banks, but there were no banks operating nationwide.

To effect transactions, people paid one another with paper checks drawn on their bank or paper currency notes issued by their bank. The banks would then clear these checks and notes among themselves. As you might imagine, with so many individual banks spread out across such a big country, effecting transactions outside the local area was cumbersome. Thus, banks would discount the value of deposited checks or notes based on the cost of presenting it to the “drawn on” bank for payment and some assessment of its creditworthiness. The farther away the bank, the less familiar its financial condition, and the greater the transportation cost associated with clearing the instrument — so the greater the discount.

To illustrate: A merchant in Kansas City, Missouri, accepting as payment a check drawn on a bank in Allentown, Pennsylvania, knew he would be credited with less than the par value of the check and would have to consult with his bank to find out exactly how much less. Obviously, this was a payment system adverse to the growth of national commerce.

By the turn of the 20th century, it was clear that the U.S. needed a better integrated national payment system. One of the main reasons Congress established the Federal Reserve System in 1913 was to create a national clearing system in which checks could exchange at par value. To achieve this, the Federal Reserve offered check clearing services free of charge to banks that joined the Fed System.

However, the Fed did not become the sole provider of check clearing services, despite offering its services for free. First of all, not all banks chose to join the Fed System, primarily because of some of the regulatory implications. In addition, large correspondent banks offered smaller respondent banks an array of services including check clearing. Also, banks could take advantage of local and national clearing house arrangements.

Nonetheless, the Fed established a large market presence, providing a baseline level of national check clearing services accessible to all banks, large and small, anywhere in the country. Thus, the Fed contributed to the viability of both the paper check and the small community bank.

In the 1960s and 1970s, U.S. banks and the Fed applied advances in technology to check processing, increasing the efficiency of their operations. Banks found the paper check payments business to be profitable, and consumers were quite comfortable and confident in their use of checks. In short, checks were the dominant form of noncash payment, and there was little momentum for change in the payments system.

In the early 1970s, the Fed introduced its Automated Clearing House, known today as Fed ACH. To date, ACH has not developed into the dominant form of electronic payment, in part, because, traditionally, only banks — not individuals — could initiate ACH payments. This made the ACH practical only for companies engaged in batch-processing a large number of payments, such as payroll disbursement.

As you know, a typical ACH transaction looks something like this: A firm forwards to its bank an electronic file containing payments to be made from the firm’s account. The bank then initiates the ACH transactions by sending the file to the Fed, which transfers funds from the bank’s account to the accounts of the various payees’ banks, and then notifies them which account holders to credit.

You are also no doubt familiar with two relatively recent variants that allow large organizations to collect regular payments using the ACH. The first transaction type involves individual customers’ authorizing their bank to make ACH payments directly to a firm — perhaps their utility company or mortgage company — on a recurring basis. The second allows merchants to convert paper checks to electronic payments through the ACH. Known as ARC, for accounts receivable conversion, this new use has increased substantially as of late.

Closer to the Consumer: Cards Drive Changes in Payments

While Fed ACH has had some success as a means to effect, and convert, routine payments, it was the credit card that proved most instrumental in moving payments from paper to electronics at the point of sale. As we all know, the credit card actually was the first ubiquitous consumer-based electronic payments instrument to emerge. Credit cards were introduced in the 1950s, and their use grew rapidly over the next three decades.

The infrastructure of credit cards in the U.S. is, or at least has traditionally been, fairly simple. The two major credit card associations, Visa and MasterCard, operate nationwide and are not subject to the anti-trust laws that prohibited collaboration among banks. In fact, the credit card associations benefited from some early antitrust rulings against banks.

In the 1990s, when the tech boom made information processing and telecommunications more powerful and less expensive, credit card companies were well-positioned to take full advantage of these developments. Low-cost telecom has made real-time, point-of-service verification of cardholders and their credit status widespread, speeding transactions and curtailing fraud. Of significance for the future, this technology has made the credit card a viable means of payment for e-commerce as well. Some card issuers even offer free consolidated bill payment on their sites, incorporating a variety of settlement mechanisms.²

After the credit card, the debit card is the second most popular electronic instrument for making retail payments in the U.S. today. The debit card arrived on the scene relatively recently — during the 1980s. But since its arrival, growth in usage has been dramatic.

At first, the debit card emerged as an enabler of banks' automated teller machine (ATM) systems, but then it moved beyond being solely a mechanism to access currency. Instead of using the card to withdraw cash from an ATM to pay merchants, bank customers had the option to simply present the card to the merchants and have their bank account debited directly.

It was not long before the credit card networks responded to the growing use of these cash access cards with debit card products of their own. Visa and MasterCard already had an infrastructure in place for processing credit card transactions at the point of sale. They leveraged that infrastructure to establish offline debit card networks. Indeed, purchase volumes with these so-called "signature" debit cards are greater than those of the original "PIN-based" cards.

In any case, debit cards in general seem to be leading the migration away from cash and checks, and toward electronic payments. The Fed's payment study found that the number of offline debit payments had the largest compound annual growth rate, at 24 percent. Indeed, the growing popularity of debit cards seems to be part of a broader phenomenon. Last year, Visa announced that for the first time ever, its global debit sales volume surpassed its credit sales volume.³

The Future of Retail Payments

Looking ahead, most experts expect that retail payments will continue moving away from cash and paper checks toward electronic instruments. Today these include credit cards, debit cards, and ACH, but other payments mechanisms are also finding their way into the payments structure. It remains to be seen if the recently emerging vehicles such as payroll cards and other prepaid cards will find a permanent place in the payments landscape.

In any case, the mid-1990s marked a clear inflection point in our payments system. From that time on, Federal Reserve research has indicated a steady decline in check usage. While the number of checks written remains large, the majority of noncash payments in the U.S. are now initiated electronically. In fact, since their peak a decade ago checks are not only losing market share, they are actually declining in absolute volume.

The last few years, in particular, have marked dramatic change for the industry. The 37 billion checks written in the U.S. in 2003 were down more than 12 percent from their 2001 levels. Over that same period, electronic transactions totaled over 44 billion, representing an increase of roughly 45 percent.

Looking forward, the share of retail transactions handled by cards, both debit and credit, will continue to grow, particularly at the point of sale. Several big-name fast-food chains are promoting greater use of payment cards at their restaurants. (It undoubtedly has not escaped their attention that customers spend, on average, over 50 percent more when they pay with a card rather than cash.)⁴

In addition, organizations other than banks, especially retailers, will expand their role in the payments system. In short, I expect keen competition among card providers, and aggressive marketing by both card

providers and merchants, to increase the speed with which cards replace paper for point-of-sale transactions.

How quickly consumers move from paper to electronics, when it comes to bill paying, is an interesting question. The speed and scope of that transition depends on both the evolution of our payments system's capabilities and consumer acceptance. In this regard, financial institutions continue to find innovative new uses for ACH, spanning a broad range of retail transactions and shifting substantial volumes to this system, primarily at the expense of check volume.

The most important of these innovations is the ARC conversion I mentioned earlier. Large organizations that receive paper checks from customers as remittance for retail payments are now scanning the checks to digitally capture their relevant payment information. The companies can then use this information to create an electronic file, which is then transmitted to an ACH payments provider — usually the Fed — for processing. In some cases, even individual merchants who accept customer checks at the point-of-sale can use the information on the check to generate an electronic file. That file is then sent to the merchant's bank for processing through the ACH. Conversion to ACH is helping to streamline payments initiated by check, even when the paper checks follow. It is also being used to process one-time payments initiated via the Internet.

As the owner/operator of the Fed ACH system, the Federal Reserve has been working to ensure its ACH system is equipped to accommodate changes in volumes and the nature of payments, even as these applications proliferate. As in check processing, the Fed is not the sole provider of ACH. Though the Federal Reserve network currently originates about two-thirds of all ACH payments volume, we are also seeing signs of growth among private-sector ACH networks. As ACH continues to gain acceptance as a payment vehicle, its products and marketing will evolve to make it more attractive and accessible to individuals and businesses.

So, while the private sector is shifting retail payments away from paper-based instruments and toward electronic ones, history tells us that people's payment habits change gradually. Only when people are comfortable with, and confident in, a payment structure are they willing to accept it. As a result, the paper check is likely to be with us for some time.

Managing the Transition

In the meantime, the Fed has been trying to take full advantage of the efficiencies afforded by electronic processing of payments, whether that transaction is initiated electronically or by paper check — all in the interest of maximizing the efficiency of the payment system.

In terms of the latter, the Fed is doing what it can to foster check truncation and electronification at as early a stage as possible in the payment process. The Fed is now well positioned to pursue this objective. Two pieces of legislation have set the stage. One is a law that has been on the books for 25 years: the Monetary Control Act of 1980. The second just went into effect a year ago: the Check Clearing for the 21st Century Act, commonly called Check 21. Let me explain the significance of each.

Recall that when the Fed began its check processing operations it provided the service at no charge to its member banks. As you all know, the Monetary Control Act of 1980 changed all that. It required the Fed to offer its payments services to all banks at prices fully reflecting the Fed's costs of production, including imputed profits. This change established a marketplace incentive for the Fed and its private-sector competitors in check processing to maximize the efficiency of their check processing operations.

The second piece of legislation, Check 21, adds an important new dimension to the competitive drive for greater efficiency in check processing. The essence of the new law is that it makes the facsimile of a check created from an electronic image serve as the legal equivalent of the check itself. In doing so, it eliminates a significant legal barrier to check truncation and the electronification of check processing. A collecting bank can now create an electronic image of a check, transmit the image to the paying bank, and then present the paying bank with either a paper reproduction or the electronic image. The hope and expectation is that gradually more and more paying banks will prefer the image.

Accepting images for both deposit and presentment eliminates back office capture of the check as well as the inconvenience of physical transportation. Under the new Check 21 legislation, it becomes even easier to move toward a more electronic check process because banks will have additional options for handling image-based payments.

As a provider of financial services, the Fed has been actively engaged in bringing a whole array of new products to market to take advantage of the capability of image clearing, thereby enabling banks to more fully exploit the benefits of Check 21. We have enhanced our business in a number of ways to encourage the use of the new image technology that the act allows. To cite just a few: We have established an image archive for electronic items; we have modified deposit deadlines and enhanced clearing times; and we have enhanced our ability to produce substitute checks. In fact, the Philadelphia Fed has earned the distinction of being the largest producer of substitute checks in the Federal Reserve System!

I encourage all of you to explore the opportunities presented by Check 21, if you have not already done so. Your District's Financial Services office is well-versed in this regard and will work with your institution to evaluate your options and assess the benefits available to you.

In any case, with the evolution of the payments system accelerating, the Federal Reserve has had to make some major adjustments to both its physical infrastructure and its payments services. Nonetheless, it remains committed to the reliability and efficiency of the current generation of payments vehicles, even as it works to foster innovation and support the next generation of payments vehicles. Both commitments are equally important during this period of transition.

With this in mind, the Fed is implementing a program of "aggressive electronification" of retail payments. This push toward electronics will help facilitate Check 21 and quicken the transition to an all-electronic world. In addition, as check volumes decline, the pressure has been on to find new processing efficiencies.

The ongoing shift to electronic payments has profoundly affected our check processing operations. The Fed currently clears about one-third of all checks written in the U.S. Nevertheless, the number of checks collected annually through the Reserve Banks has fallen nearly 20 percent since 1999, and the decline continues to accelerate. Consequently, the Fed has had to consolidate its operations, closing down processing sites where appropriate. Nonetheless, it has attempted to maintain reasonable service levels nationally by re-routing checks to nearby sites.

So that you can see the scale of this effort, I will note that two years ago the Fed had 45 check processing sites. By mid-2006 we will be down to 22. This downsizing to match costs and revenues helps us fulfill our traditional role of payments processor while at the same time maintaining efficiency in this new environment.

Such a radical transformation within our financial services division is necessary by law. As I mentioned a moment ago, the Monetary Control Act mandated that we set prices on our services to fully recover our costs. So, we are required to adjust our portfolio of services to correspond to the clearing needs of the industry. As such, the aggregate decline in this volume-based service creates a substantial challenge to the System. And achieving full cost recovery will become more challenging for us as the volume of check usage continues to decline.

Nonetheless, by setting prices that reflect the low cost of electronic check processing relative to paper, the Fed will allow, indeed encourage, the market to drive checks toward electronics. In addition, we will continue to develop our capabilities and expand our electronics capacity to respond to the market's evolution and consumers' needs. The impact of these changes and those that follow will ultimately transform our nation's payments system and enable a radical restructuring of its service capabilities.

Conclusion

Markets and consumers led us to a multiplicity of banks and a payments system that has been paper intensive. This is changing, as cards are replacing checks, and electronic clearing is truncating the maze of paper that fills our mailboxes. Our progress, while promising, occurs largely in fits and starts. We are a large nation with many providers, much complexity, and a philosophy of market-based solutions.

This has presented challenges for the Federal Reserve as a provider of financial services. It has necessitated restructurings, plant closings, and difficult decisions. Yet, we at the Federal Reserve are charged with the dual role of a regulator seeking to maintain the stability and efficiency of the payments system, even as we remain a provider of payment services. At times, these roles present different challenges. This is one of those times.

Nonetheless, as payments technology moves forward, our payments system will continue to change as evolutionary forces generate new innovations in payments and new ways to deliver them. This is why, in our own Reserve Bank, we have established a Payment Cards Center to add to our understanding of the use of electronic payment vehicles by consumers and their broader impact on the financial system.

Our job and yours is to watch the long-run trends and ensure that our institutions are adequately prepared for this period of change. I know that the Federal Reserve is up to this challenge and believe that the banks of the Commonwealth of Pennsylvania are too.

Thank you. I'd be happy to take your questions.

1. Holly Sraeel, "Nonbank Payments: Are Banks Green? Yes and No," *Bank Technology News*, May 2005.
2. James C. McGrath, "Will Online Bill Payment Spell the Demise of Paper Checks?" Discussion Paper, Federal Reserve Bank of Philadelphia Payment Cards Center, July 2005.
3. Press release, "Visa Global Debit Card Sales Volume Surpasses Credit," Visa International, April 20, 2004.
4. W.A. Lee, "CEO Confident as Visa Posts More Records," *American Banker*, August 5, 2004.