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# FRBSF WEEKLY LETTER

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## Progress in Retail Payments

Technological innovation has introduced new retail payment methods that have the potential to replace, to varying degrees, the traditional methods of cash, check, and credit card. If widely adopted, these new methods could increase retail payments efficiency by replacing paper-based systems, especially checks, with computer- and electronic-based systems. However, certain characteristics of the check system and of payments systems generally may inhibit the widespread adoption of such systems. In this issue of the *Weekly Letter*, I discuss these characteristics and the prospects for increased efficiency in retail payments.

### **The Automated Clearing House and direct debit**

The most familiar and popular small value, or "retail," payment instruments are cash, check, and credit card. As of 1987, approximately 83.4 percent of the total number of transactions in the United States were conducted using cash, 14.1 percent were made by check, and 1.5 percent were conducted using a credit card.

Relatively new and perhaps unfamiliar types of retail payment methods include the Automated Clearing House (ACH) and debit cards at the point of sale. Together, these payment methods account for only about 0.3 percent of payments made in the United States, the remainder consisting of travelers checks, money orders, wire transfers, and automated teller machine bill payment.

*ACH.* The ACH was established in the early 1970s, with the goal of providing an electronic alternative to checks for regularly scheduled, relatively low-value payments. There are two types of ACH transactions—credit and debit. ACH credit transactions are initiated by the payor, and debit transactions are initiated by the recipient of funds, the payee. For debit transactions, the payor has to agree beforehand that the payee will be permitted to initiate such transfers. Credit and debit transfers can be originated via diskette, magnetic tape, or electronic transmission.

At present, the ACH is relatively underused by the private sector. Less than 10 percent of U.S. private sector employees receive their salaries

through the ACH, while about 46 percent of Social Security recipients receive their benefits and 67 percent of government employees receive their salaries by this means.

*Debit Cards at the Point of Sale.* Debit cards are magnetically encoded, machine-readable plastic cards, like credit cards in appearance. They enable a customer to make a payment at the point of sale that more or less automatically debits the customer's deposit account and credits the merchant's account. Some point of sale (POS) systems are "off-line" in the sense that using a debit card creates a paper sales draft which is used for posting to accounts. Other POS systems are "on-line" in the sense that customers' accounts are debited completely electronically, either immediately or in a day or two. Gas stations, supermarkets, convenience stores, and fast food restaurants, where purchases typically are made with cash or checks, are beginning to adopt POS systems, but only gradually.

Debit POS would seem to offer several advantages to consumers, over checks at least. For example, a debit POS transaction often is faster than a check transaction. Retail customers have to handwrite checks and often provide identification information that the merchant must then examine and perhaps transcribe onto the check. In contrast, an on-line debit POS transaction requires the customer only to swipe a card through a slot and key in transaction information and a personal identification number on a keypad. Also, many consumers appreciate the automatic balancing and written record of purchases that debit POS provides. In addition, balances can be checked and cash can easily be obtained in conjunction with a debit POS transaction.

### **Relative costs**

As noted above, the ACH and debit POS systems account for only 0.3 percent of transactions in the United States and are used much more infrequently than checks for retail payments. However, economists Allen Berger and David Humphrey have suggested that ACH and debit POS transactions are significantly more efficient than check transactions. The processing and accounting

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costs that payees incur and the processing and transportation costs that the banking system and the Federal Reserve incur in collecting these pieces of paper account for a significant portion of the cost disadvantage of checks over electronic payment methods. Berger and Humphrey estimate that the cost of an ACH transaction is \$0.29 and that of a POS transaction is \$0.47. (The POS transaction cost figure is probably more representative of on-line than of off-line POS transactions.) A check transaction, on the other hand, uses up \$0.79 in real resources.

If checks are so inefficient and costly, then why are they so popular? According to Berger and Humphrey, the answer is that payors benefit from check "float," but don't pay enough for this benefit. Float is the interest the payor saves due to good funds not being debited from his or her bank account until some time after the good or service has been transferred. Float arises because it takes time to process, transport, and clear checks and because the check recipient, the payee, may not immediately deposit or cash the check. Berger and Humphrey explain that people who use checks don't pay enough for the benefit of float in the sense that they don't fully compensate payees for their float costs—costs that arise because payees don't receive good funds until some time after the transaction occurs (although often before the payor's account is debited). This "underpricing" of float is at least partially due to the constraints of custom, law, and logistics that make it difficult to charge a different price if payment is made by check than if it is made by some other means.

Prospects for reducing float anytime soon and thereby encouraging the use of the ACH and debit POS are dim. Float is not likely to be significantly reduced without the widespread adoption of technological innovations such as digital image processing that have the potential to speed up check processing and collection. Unfortunately, sufficiently high-speed systems are still a few years off.

Eventually, though, a significant reduction in float would likely be effective in reducing households' and businesses' check usage. Dollar amounts for business checks are large enough that the interest saved due to float is significant. For businesses, if float were substantially reduced, the relevant alternative to checks would likely be the ACH.

Consumers, on the other hand, probably benefit from float not because of the interest savings, but rather because of the liquidity benefits of the delayed debiting of their account. For example, anecdotal evidence indicates that a significant fraction of supermarket shoppers who pay for their groceries with checks are awaiting an account credit (perhaps a paycheck deposit) but in fact have insufficient funds in their accounts at the time they write the check. For consumers, the relevant alternative to checks would probably be debit POS.

## The pricing bugaboo

In both check payment systems and electronic payment systems, the pricing of the payment service itself is somewhat complicated. This complexity may also be contributing to the somewhat slow growth of debit POS; pricing arrangements are well-established for checks, but must still be worked out for debit POS.

Payment system pricing can be complex because there are at least *three* supply and demand relationships, and therefore three prices, involved. The first is the usual one—the price the buyer is willing to pay the seller for the product, say, tomatoes. The second price is the one the consumer's bank charges for debiting the consumer's account. The third price is the one the merchant's bank charges for crediting his account. All of these prices are tied to one another because, given the price of tomatoes, the more the customer has to pay for his payment service, the fewer tomatoes he'll want to buy; similarly, the more the merchant has to pay for his payment service, the fewer tomatoes he'll want to sell.

Just as institutional and other constraints may make it difficult for float to have the correct price, they may also contribute to the complexity of pricing in payment systems that involve multiple parties. This complexity is evident in the variety of types of prices and fees that can exist. For example, in certain systems, buyer's and seller's banks may pay each other. In addition, a bank may have to pay a third-party processor several different types of fees.

Because debit POS is relatively new, participants still have to work out appropriate pricing structures. Observers comment that myriad pricing schemes now are used by regional POS networks and that feasible pricing schemes for national

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POS networks are being debated. For example, there is some controversy surrounding the structure of one type of fee paid by merchants' banks. The national on-line POS network, Interlink, has reportedly instituted a 45-basis point "interchange fee," a side payment to be paid by the merchant's bank to the customer's bank. This type of interchange fee is a percentage of the dollar value of a transaction. Apparently, many merchants believe that percentage interchange rates, as opposed to flat interchange fees per transaction, will potentially lead to prohibitive costs for them, and therefore vehemently oppose the percentage rates.

The brief discussion above hints that we should not be surprised if pricing issues are a sticking point in the early stages of growth of debit POS. It will naturally take time and experience to work out pricing arrangements in these new systems. The pricing of check services in the early days of widespread check usage in the nineteenth and beginning of the twentieth centuries also was characterized by controversy.

#### **Conclusion**

For more than a century, the check has been a very popular means of retail payment. Today, electronic and computer technologies offer us the opportunity to replace checks, to a large degree, with more efficient retail payment methods such as the ACH and debit POS.

However, businesses and individuals will not take advantage of this opportunity on a widespread basis at least until check float is somewhat diminished. This may happen if technology significantly reduces the need for the physical transport of checks, but such developments are unlikely in the near future.

In addition, consumer use of debit POS will require the solution of problems entailed in working out mutually agreeable and beneficial pricing arrangements. But, as long as POS network participants recognize the complications inherent in the pricing of payments services and are not bound by custom and past practice, more and more debit POS terminals should begin showing up at merchant locations over the next several years.

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