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# Electronic Payments in the U.S. Economy: An Overview

*By Stuart E. Weiner*

**B**usiness publications are filled these days with stories about the digital or electronic economy. One routinely reads about e-commerce, e-business, and e-banking. Terms such as e-mail and e-tickets have entered the common lexicon. Some analysts have gone so far as to proclaim that the U.S. economy is being fundamentally transformed and is entering a “new age” of unparalleled growth and opportunity.

While such a view is open to debate, clearly some major, potentially far-ranging, changes are under way. The most visible and most dramatic involve e-commerce. A growing amount of economic activity is taking place on the Internet, directly or indirectly impacting households and businesses throughout the economy. Less visible, but also significant, are changes involving “e-payments.” Although the U.S. payments system continues to rely heavily on paper-based methods, cash and checks, for conducting transactions, electronic payments are steadily gaining a greater presence.

This article provides an overview of e-payments as they currently exist in the United States. It shows that the U.S. payments system is becoming more electronic, principally through traditional

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*Stuart E. Weiner is a vice president and economist and head of the Payments System Research function at the Federal Reserve Bank of Kansas City. This article is on the bank's web site at [www.kc.frb.org](http://www.kc.frb.org).*

means. While new instruments are beginning to emerge, it is the traditional e-payment types—credit cards, debit cards, and ACH transactions—that are driving the U.S. payments system forward.<sup>1</sup>

The first section of the article reviews cash and check usage in the United States, noting that even these instruments are becoming more electronic. The following sections then survey the various types of e-payments proper, including credit and debit cards, wire transfers and ACH transactions, and e-money. The article closes with a brief discussion of some of the factors that may influence the evolution of e-payments in the U.S. economy in the future.

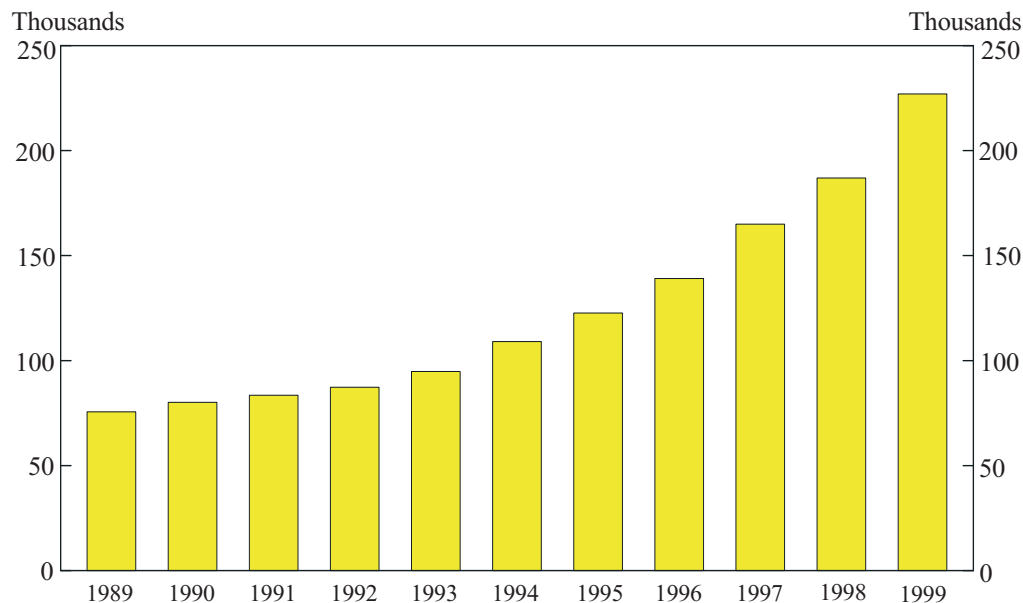
## I. CASH AND CHECKS

Cash and checks remain the dominant forms of payment in the United States. Even these paper-based instruments, however, are being affected by advancing electronic technologies.

### *Cash and ATMs*

While the use of cash (currency and coin) is extremely difficult to measure, many estimates place its share at 50 percent or more in terms of the total number of transactions in the U.S. economy.<sup>2</sup> Cash, of course, is inherently a non-electronic payments method. But its usage

Chart 1  
NUMBER OF ATM TERMINALS



Source: *Bank Network News*, "EFT Network Data Book-2000 Edition," vol. 18, no. 6, August 11, 1999.

in recent years has been bolstered, or at least supported, by a decidedly electronic dispenser, the automated teller machine (ATM). ATMs do not represent a payments type per se, but rather are an electronic means of dispensing cash. They offer a convenient alternative to more traditional dispensers, such as bank tellers, automobile drive-through facilities, and supermarket checkout lines.

An ATM card allows a customer to withdraw cash from his or her bank account by entering a PIN number and having the amount of the withdrawal immediately debited from the account. ATM transactions rely on an extensive communications system that includes both regional and national networks that can interact with one another. The four participants in an ATM transaction include the customer, the card-issuing

bank, the ATM owner, and the network or networks that the card-issuer and ATM owner join. Outwardly seamless and quick, an ATM transaction in fact involves a series of complex, underlying, interrelated processing steps.

The total number of ATM transactions has more than doubled over the last ten years and is estimated to reach near 11 billion again this year. And although there are signs that ATM volume may be peaking, ATM access continues to grow. The total number of ATM terminals has tripled over the last ten years (Chart 1). Today, more than 50 percent are located off bank premises at such locations as convenience stores, gas stations, and shopping malls (*Bank Network News*). Somewhat ironically, the growth in ATMs and their ever-widening access is contributing to the e-economy "feel" despite

Table 1  
NONCASH PAYMENT TYPES, UNITED STATES

	Number of transactions 1997 (billions)	Average annual growth in number of transactions, 1993-97 (percent)	Share of number of transactions	
			1993 (percent)	1997 (percent)
Checks	66.09	2.3	79.1	72.2
Credit cards	16.88	7.8	16.4	18.4
Debit cards	3.91	53.3	.9	4.3
ACH	4.55	15.5	3.4	5.0
Wire transfer	.15	7.3	.1	.2

Source: Derived from BIS, *Statistics on Payment Systems in the Group of Ten Countries*, December, 1998, p.110, and NACHA, "ACH Statistics Fact Sheet 1989-1998," [www.nacha.org/resources/facts/1998achstats.htm](http://www.nacha.org/resources/facts/1998achstats.htm). Shares do not sum to 100.0 due to rounding.

being intrinsically linked to a core, paper-based payments method.

### *Checks and ECP*

The other principal paper-based method, the check, also remains deeply embedded in the U.S. payments system. As shown in Table 1, 66 billion checks were written in the United States in 1997, accounting for 72 percent of the total number of noncash transactions. The United States utilizes checks more than any other industrialized country.<sup>3</sup> But while check usage remains at an extremely high level, its share is trending downward (from 79 percent in 1993) as the growth in checks trails the growth of other, electronic, payments types. As noted in the table, credit cards, debit cards, ACH transactions, and wire transfers are all experiencing faster growth than checks, the result being that the sum of their transaction shares has risen from 21 percent in 1993 to 28 percent in 1997. Thus, e-payments are on the rise in the United States, and each of these payments types will be discussed shortly.

Still, checks remain pervasive in the U.S. payments system, used by individuals, businesses, and governments alike to pay for a vast array of goods and services. And, unfortunately, the clearing and settling of a check is an expensive process, estimated to cost two to three times more than an electronic payment (Hancock and Humphrey). A check accepted by a merchant, for example, must first be deposited at the merchant's bank, sorted with other checks, and then physically transported to the payer's bank for collection. Along the way, there are numerous processing steps, and the associated personnel, equipment, and transportation costs are high.

In recognition of this, clearing house associations, the Federal Reserve, and the banking industry in general have been striving in recent years to electrify various aspects of the check collection process. This effort is called electronic check presentment (ECP), a process by which the routing and payment information on a paper check is unbundled from the check

itself and transmitted electronically to the paying bank. In the strong form of ECP—known as truncation—the paper check never follows. In the weak form of ECP, the paper check is eventually sent to the paying bank, negating some of the cost savings that would result from full truncation but still making the check collection process faster and more efficient. Over the first seven months of this year, 18 percent of the total checks processed by the Federal Reserve were presented electronically, either in truncated form or with checks to follow.

As part of the ECP effort, other programs are also under way that are designed to bring advanced technologies to check clearing and settlement. Some Federal Reserve offices, for example, are now offering pilot programs that offer digital images of truncated checks to ECP customers over the Internet. The use of digital imaging in other parts of the check process is being explored as well. Thus, as with cash and ATMs, there is a growing “electronic” aspect to checks. But in all such check electrification programs, a paper check still enters the system. The mark of a true electronic payments type—an e-payment—is no paper. E-payments are taken up next.

## II. CREDIT CARDS AND DEBIT CARDS

The first major category of electronic payments is credit cards and debit cards. Together, they account for nearly a quarter of noncash transactions in the U.S. economy.

### *Credit cards*

Credit cards are the most common and most familiar e-payment type in the United States.<sup>4</sup> As shown in Table 1, there were nearly 17 billion credit card transactions in 1997, representing 18.4 percent of all transactions. Over the 1993 to 1997 period, credit card transactions grew at a 7.8 percent annual rate.

Credit card transactions take place over large electronic networks, typically linking cardholders, merchants, card-issuing banks, merchants’ banks, and the credit card companies.<sup>5</sup> Roughly half a billion general purpose cards are in circulation, with 85 percent of those being bank-issued MasterCard or VISA cards. But nonbank general purpose cards—American Express, Discover, and Diners Club cards—also play an important role, presently accounting for over one-fourth of all general purpose dollar outlays (*Nilson Report 1999*).<sup>6</sup>

Some of the recent growth in credit card transactions no doubt reflects the increase in purchases of goods and services over the Internet, that is, e-commerce. Although definitive data are lacking, available information suggests that a large majority of Internet purchases are currently conducted via credit card.<sup>7</sup> Some card-issuing banks are aggressively seeking to grow their Internet-related business, urging customers to choose their particular credit card for online purchases. Other card-issuing banks are viewing the Internet more as a marketing tool, using online advertising to entice new customers to apply for their card. Reflecting both strategies, cobranding of bank credit cards with Internet firms is on the rise (*American Banker*).

Credit card usage for Internet sales has also spurred discussion of so-called digital wallets. One of the drawbacks of using credit cards for online purchases is that credit card information, as well as billing and shipping information, has to be reentered into a form every time a new merchant is visited. A digital wallet is software that permits the cardholder to store such information on his or her personal computer or on a server operated by the company issuing the wallet. When the customer is ready to make an online purchase, he or she can transmit these data with a single mouse click, making Internet credit card transactions easier. To date, however, digital wallets have attracted little interest from consumers.<sup>8</sup>

### Debit cards

While credit cards remain the principal type of electronic payment in the United States in terms of the number and share of transactions, the use of debit cards is growing at a much faster rate. Indeed, debit cards are the most rapidly growing payment type in the United States. As seen in Table 1, annual debit card transaction growth has averaged 53 percent in recent years, and debit cards now account for over 4 percent of total transactions. The number of debit cards in circulation has reached some 250 million (*Bank Network News*). A recent Federal Reserve Bank of Kansas City survey reflects these trends: 77 percent of responding banks now offer debit cards, and an additional 14 percent plan to do so within a year.

Debit cards are used for point-of-sale (POS) transactions; that is, a customer presents a debit card to a merchant just as he or she would present a credit card. But debit card transactions do not involve credit. Instead, as with ATM transactions, debit card transactions are linked to a customer's bank account. Online debit transactions require the customer to enter a PIN number, and the amount of the transaction is immediately debited from the customer's account. Offline debit transactions require a signature, and, while settlement is not immediate, authorization is required.

Like ATM and credit card transactions, debit card transactions are made possible through interlinked communications networks. Participants include consumers, merchants, card-issuing banks, merchants' banks, and regional and national networks. Online debit card transactions operate through the same networks as ATM transactions. Offline debit card transactions operate through credit card networks. A typical debit card will allow the holder to access one or more debit card networks as well as one or more ATM networks.

A number of factors have likely contributed to the increased use of debit cards in recent years. Growing familiarity with the debit card instrument, increased consumer and merchant acceptance, more aggressive marketing on the part of banks, and the convenience of coupling POS and ATM capabilities on a single card have probably all played a role. Another key factor has been the emergence of the VISA and MasterCard offline debit card networks, which piggyback off their respective credit card networks. Introduced in the early 1990s, these networks have opened up the entire VISA and MasterCard credit card infrastructures to debit card users.

Reflecting this, while the number of online debit card transactions has been rising sharply, the number of offline transactions has surged even more. Since 1995, offline transaction volume has grown at a 60 percent pace (*Bank Network News*). The number of offline debit cards in circulation has nearly tripled (Chart 2).

In addition to their standard uses, debit card networks and ATM networks are also being used for Electronic Benefits Transfer (EBT) programs. These programs are being used by various government agencies to deliver cash entitlement and food assistance benefits to recipients who do not have bank accounts. Recipients are issued cards that allow them to make cash withdrawals from designated ATM machines or to make food purchases at the debit card terminals of designated grocery and convenience stores. At present, the federal government and 39 states have EBT programs in place, providing benefits to over 4 million families (Federal Electronic Commerce Program Office).

### III. WIRE TRANSFER AND ACH

A second major category of electronic payments is funds transfer systems. Unlike credit and debit cards, which place a payments instru-

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