

Payment instrument choice: The case of prepaid cards

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Introduction and summary

Technological advances continue to allow more and more individuals and businesses to shift toward the electronic delivery of information instead of the exchange of paper-based documents. Examples of this migration include the use of email instead of traditional mail service, the delivery of real-time news via the Internet instead of a physical newspaper, and the payment of bills using online transfers instead of mailing checks. While electronic delivery is faster, often less costly, and often more reliable and secure, the older paper-based systems have not disappeared. Some users of the older technology prefer it to the newer technology, given the incentives they face today. In this article, we will explore the replacement of paper-based payment instruments by prepaid payment cards—an electronic alternative.

The adoption of electronic payment instruments that are able to access sophisticated and extensive networks to authorize, process, and settle payments with relative ease continues to increase. Today, the total number of electronic transactions made in the United States, which accounts for around 55 percent of non-cash transactions, has surpassed the number of check payments, which accounts for around 45 percent of non-cash transactions (Federal Reserve System, 2004). U.S. consumers used checks for 11 percent of their in-store purchases and used payment cards for 56 percent of their in-store purchases in 2005 (American Bankers Association and Dove Consulting, 2005). This shift to electronic payments suggests that payment participants generally prefer electronic payments to checks.

While cash transactions are more difficult to measure, recent survey evidence of in-store purchases reports that cash transactions have remained stable from 2001 to 2005, suggesting that providers of electronic alternatives have had difficulty in convincing consumers and merchants to decrease their cash usage

recently (American Bankers Association and Dove Consulting, 2005). However, considering a longer time horizon, Humphrey (2004) estimates that U.S. legal cash usage as a share of consumer payments fell from 31 percent in 1974 to 27 percent in 2000. He attributes the decrease in cash payments to greater usage of payment cards, mainly credit and debit cards.

Today, the usage of prepaid cards in certain payment segments is growing rapidly and generally replacing paper-based payment instruments. In this article, we will focus on prepaid products for which the purchaser of the card is different than the consumer who uses the value to pay for goods and services. We find that prepaid cards allow purchasers to transfer funds that are accessed electronically when goods and services are bought by recipients. Prepaid cards allow recipients without relationships with financial institutions to make electronic payments. In addition, prepaid cards allow purchasers to restrict the types of merchants or products that can be bought by recipients.

However, even if a payment segment is ideal for prepaid products, adoption of them will depend on the ability of providers of these products to get all transactors on board. In general, each prepaid payment participant should receive at least the same net benefit as the next best payment alternative while one participant receives a higher net benefit. In this article, we will discuss the costs and benefits to payment system participants of using various payment mechanisms. We will specifically explore the costs and benefits of

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prepaid card applications over existing payment instruments for certain payment segments.

Traditional payment instruments

Each type of payment instrument provides a distinct set of costs and benefits to consumers, businesses, and payment providers. We will focus on payments to and from consumers in this article.¹ In this section, we will discuss the costs and benefits of traditional payment instruments, such as cash and checks, along with their electronic alternatives.

Cash

Among the different types of payment instruments that we will discuss, cash is the most widely accepted. Cash is a value-based instrument. In a value-based transaction, the payor, the one making the payment, transfers value to the payee, the one receiving the payment, and the value is backed by a third party, for example, a central bank, a financial institution, or the seller.² The proportion of in-store cash purchases remained stable at around a third of all transactions from 2001 to 2005 (American Bankers Association and Dove Consulting, 2005).

Consumers use cash to buy goods and services. Upon receiving cash from customers, merchants may deposit the cash at their financial institutions or use it for subsequent transactions. Cash has several advantages over other payment instruments. First, repeated cash transactions can take place without third party intermediation. In other words, no relationship with a financial institution is required for the payor or payee to use cash, unlike other types of payment instruments. While financial institutions need not play a direct role in each cash transaction, they play a vital role in the collection and distribution of cash. Second, cash is widely accepted for payment by individuals, businesses, and government. Third, there is little settlement risk with cash, since it is a liability of a central bank.³ Fourth, some consumers and merchants may prefer to have transactions that are not easily tracked, such as those using cash.

However, despite cash's advantages as a payment instrument, it does pose some challenges for consumers and merchants. First, while cash is used commonly for low-value transactions, because of security and safekeeping concerns, consumers and merchants usually prefer other types of payment options for larger-value transactions.⁴ Unlike other instruments such as checks, if cash is lost or stolen, consumers have little recourse to recover their loss. Second, cash is generally not suitable for non-face-to-face transactions. In fact, billers generally do not accept cash payments via mail.

Third, cash transactions may be significantly slower than some other types of payments because consumers may require change or time to sift through their wallets to find the appropriate denominations of currency.

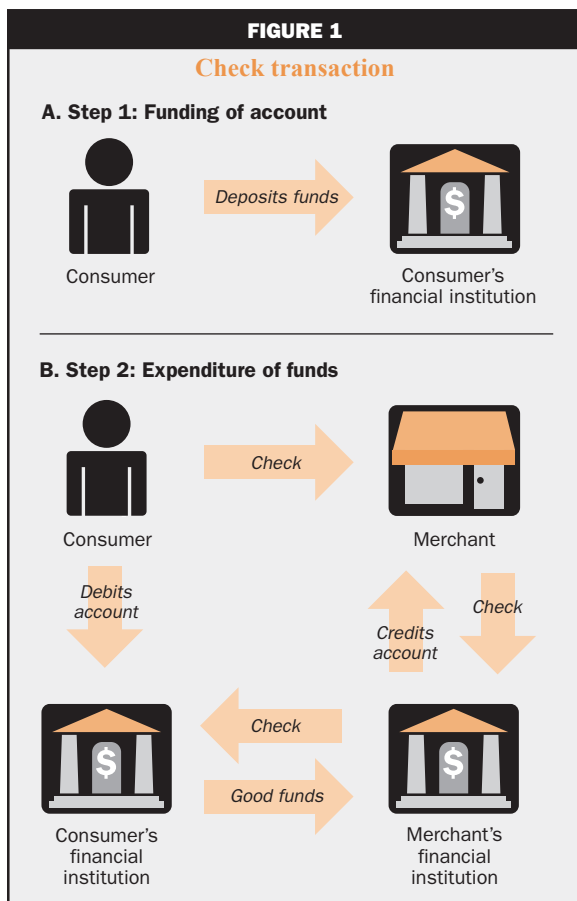
In some instances, sellers of goods and services charge more for cash transactions or eliminate cash transactions altogether. Recently, the Illinois Tollway has started to charge twice as much for passenger cars that use cash instead of an I-PASS, a radio frequency identification device used to make payment for tolls. A key factor driving the Illinois Tollway's decision was the reduction in road congestion resulting from faster processing of noncash payments.⁵ The U.S. Navy eliminated the acceptance of cash on ships that were equipped with the Navy Cash Card, a prepaid card. The U.S. Navy's decision to eliminate cash and implement a prepaid solution was primarily motivated by significant cash handling costs.⁶

Account-based transactions

Checks are account-based transactions that started to replace cash transactions after the 1870s.⁷ In an account-based transaction, the consumer's transactions account at a financial institution is debited the value of the transaction. Hence, account-based transactions require payors to have an existing relationship with a financial institution. Checks are generally more secure than cash transactions for both payors and payees. Access to a transactions account may be turned off or a stop payment can be requested on a specific check to prevent unauthorized use.

In figure 1, we diagram a check transaction. First, a consumer funds his accounts by making a deposit. Second, a consumer uses a check to pay for goods and services. Third, the merchant deposits the check with its financial institution. Fourth, the merchant's financial institution presents the check to the consumer's financial institution. If funds are available, the consumer's financial institution sends good funds to the merchant's financial institution, which then credits the merchant's account.⁸ Check payments usually need to be converted to good funds prior to being used in other transactions by payees.

Electronic account-based instruments continue to gain greater market share, while check volumes continue to decline in the United States. Checks paid declined in the United States from 41.9 billion in 2000 to 36.7 billion in 2003, while automated clearinghouse (ACH) payments increased from 6.2 billion to 9.1 billion and debit card payments increased from 8.3 billion to 15.6 billion over the same period (Federal Reserve System, 2004).⁹ However, checks still remain a popular means of payment for business-to-business and remote



bill payment, although the share of electronic alternatives continues to grow in these payment segments.

A more cost-effective and convenient option for certain check payments are ACH payments. In ACH payments, the payor's or the payee's financial institution initiates a payment via an ACH network. The flow of funds in an ACH debit transaction, for example, a recurring bill payment, is similar to a check transaction.¹⁰ While developed primarily for recurring remote payments, ACH payments have also spread to other payment segments. Some merchants are converting their check payments into ACH payments to reduce their check processing costs.

The debit card is an account-based check substitute for point-of-sale transactions and, more recently, for remote transactions.¹¹ The flow of funds for debit card transactions is similar to checks, except payees must have in place the necessary arrangements to accept debit cards. Consumers and merchants benefit from faster transaction times at the cashier. Klee (2004) reports that check transactions take up to 30 percent longer than debit card transactions at the point of sale (POS). Unlike checks, most debit card transactions

are authorized by the payor's financial institution, thereby substantially reducing or eliminating settlement risk that exists for checks and ACH debit payments.

Account-based instruments benefit consumers and merchants in several ways. Consumers benefit from being able to readily access their transactions accounts to make point-of-sale and remote payments. They may also benefit from interest income on their funds before their payments clear and settle. Merchants benefit from lower cash handling costs and potentially greater sales from selling to consumers who may not have sufficient cash in their wallets. Financial institutions benefit from interest income on idle funds in transactions accounts, possible fee income from account holders, and interchange fees if debit cards are used by account holders.¹²

Credit-based transactions

Credit and charge cards are examples of credit-based payment instruments because a third party is extending credit to the payor. These types of payments increased from 15.6 billion to 19.0 billion from 2000 to 2003 in the United States (Federal Reserve System, 2004). Credit card and charge card transactions are similar to debit card transactions, except that payors do not deposit funds with financial institutions but instead establish credit lines that are accessed when making purchases. Payors benefit from the ability to purchase today and pay tomorrow. Merchants benefit from sales to consumers who do not have sufficient funds to make purchases.¹³

Credit and charge transactions clear and settle similarly to debit card transactions, with the main difference being that the payor is extended credit by his financial institution. Today, operators of credit card networks use their existing infrastructure to process debit card and prepaid card transactions. Both of these general-purpose payment products gained greater adoption by utilizing existing payment networks already being used to clear and settle credit card and automated teller machine (ATM) transactions.

Prepaid payment products

For the most part, existing payment mechanisms, such as cash, check, and credit and debit cards, along with ACH payments, seem to be preferred by consumers and merchants over general-purpose prepaid cards. Prepaid cards are prefunded; their value either resides on the card or at a remote database.¹⁴ Initially, such instruments were introduced to compete with small-value cash transactions.¹⁵ While prepaid cards have been effective as a cash substitute in closed environments, such as mass transit systems, university

campuses, and coffee shops, general-purpose prepaid cards have not been able to gain significant market penetration as a cash substitute (Chakravorti, 2004; Van Hove, 2004a, 2005).

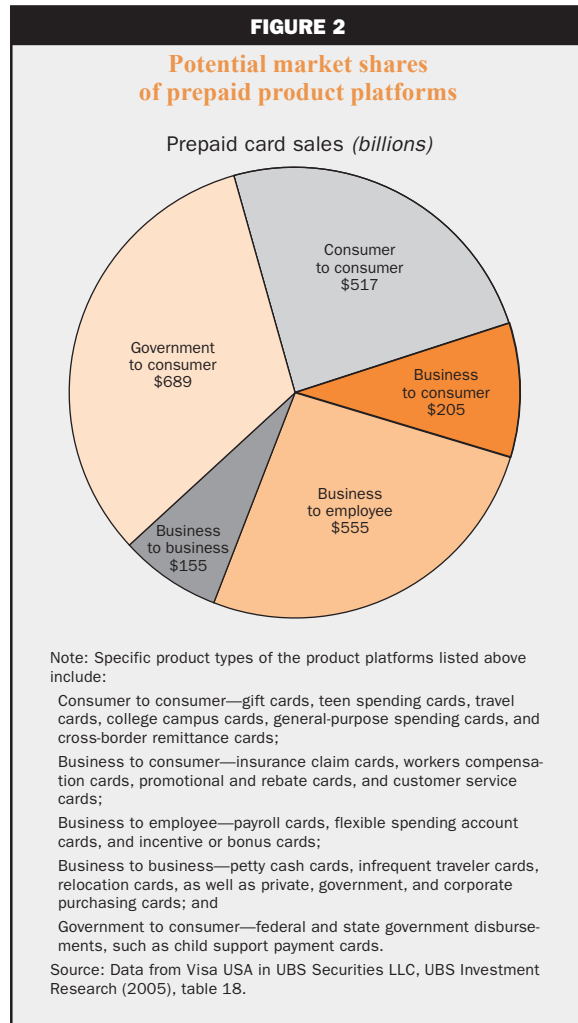
There have been several applications of retailer-specific prepaid cards that have been successful.¹⁶ Retailer-specific prepaid cards provide benefits to both consumers and merchants. Benefits to consumers include convenience, speed, and possible rewards, such as discounts on future purchases. Benefits to merchants include receiving cash in advance of the delivery of goods and services, increased loyalty, potentially faster payment processing at the point of sale, and potentially lower payment processing costs. Note that if the benefit to the retailer is greater than the cost, the retailer may “pay” customers to purchase and use its prepaid card.

While the market for prepaid cards is still emerging, certain prepaid applications are growing rapidly. Accurate data regarding the usage and volume of prepaid payments is difficult to collect primarily because of the diversity of issuers and applications, along with the lack of an established uniform definition of a prepaid payment product.¹⁷ According to HSN Consultants Inc. (1999–2005), the value of prepaid card purchases increased from \$30.31 billion in 1999 to \$115.78 billion in 2004. In 1999, HSN Consultants Inc. predicted that the 2005 dollar volume would be only \$80.69 billion, suggesting that the growth of prepaid applications has been faster than expected. The potential overall prepaid card market in 2002 was estimated to be around \$2 trillion, suggesting that the market is far from being saturated (UBS Securities LLC, UBS Investment Research, 2005). In figure 2, we break down the various prepaid market segments and their potential size.

In the United States, applications of general-purpose prepaid cards in which the purchaser or the disburser of funds is different from the ultimate consumer of goods and services are growing rapidly. Here, we focus on prepaid payment products for which there are three distinct transactors: the purchaser or disburser of funds, the consumer or recipient of funds, and the seller of goods and services. Prepaid cards allow recipients to receive funds and spend them where the prepaid value is accepted. In some cases, the prepaid value can be converted to cash. Whether purchasers, recipients, and sellers of goods and services adopt a new payment choice is dependent on costs and benefits of prepaid products versus existing payment choices.

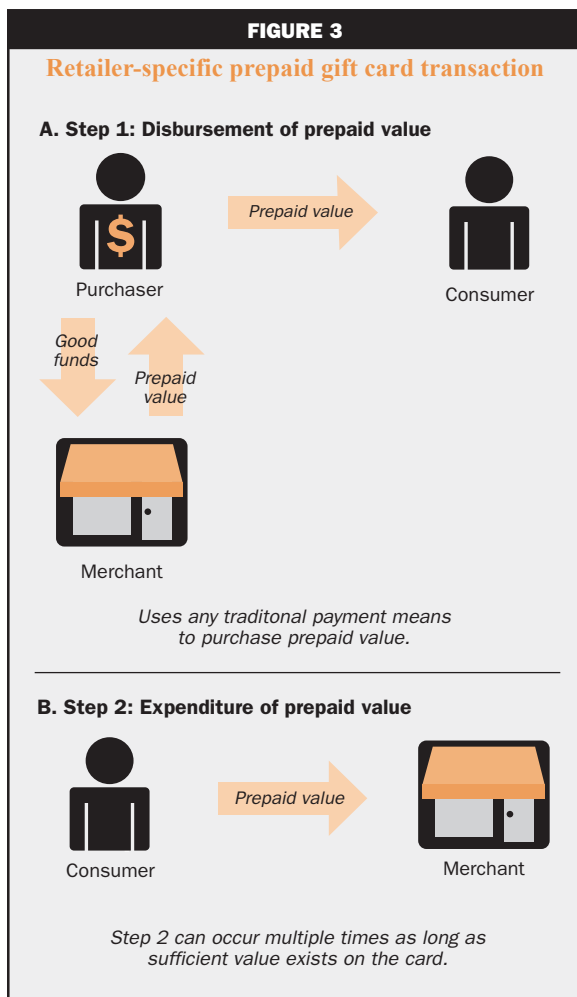
Retailer-specific gift cards

We define a retailer-specific gift card as a prepaid card that is purchased by someone other than the consumer who uses the card to buy goods and



services at a specific retailer. Reliable statistics on retailer-specific gift card usage are difficult to obtain, given the diverse set of merchants that offer them. Today, retailer-specific gift cards account for the greatest number of transactions of any prepaid card application. The National Retail Federation (NRF) estimates that there were \$48 billion in retailer-issued gift card sales in 2004 (eFunds Corporation, 2005).

By giving retailer-specific gift cards, purchasers are personalizing their gifts by restricting recipients to shop at specific merchants. Generally, neither the purchaser nor the recipient pays any fees if the underlying value is used within a certain time frame.¹⁸ Gift cards offer merchants an opportunity to sell more than the prepaid value that was given to recipients. Gift card recipients spend as much as 40 percent more than the value of the card (Alexander, 2005). In addition, gift card issuers benefit from unclaimed prepaid value. In figure 3, we diagram the two steps of a retailer-specific prepaid card transaction. In step 1, the purchaser



buys the prepaid value from the merchant and then gives the prepaid value to the consumer. In step 2, the consumer makes a purchase at the merchant, using the prepaid value.

General-purpose prepaid cards

General-purpose prepaid cards can be used in various payment segments. They are similar to cash in that they are value-based payment instruments and are also widely accepted, though not to the degree that cash is. They are similar to debit cards because they debit the value of the transaction from an account at a financial institution, although the account is not owned by the purchaser or the recipient. General-purpose prepaid cards usually utilize existing payment networks to clear and settle transactions.¹⁹ In addition, the acceptance of general-purpose prepaid cards is linked to the acceptance of debit cards—a more mature payment instrument—resulting in greater acceptance.

In figure 4, we diagram a general-purpose prepaid card transaction. In step 1, the purchaser buys prepaid value in exchange for good funds and then gives the “loaded” prepaid card to the consumer. Note that neither the purchaser nor the consumer needs to have a relationship with a financial institution. In step 2, the consumer uses the prepaid value to buy goods and services at a merchant that accepts the card. The merchant’s financial institution exchanges the prepaid value for good funds with the issuer of the prepaid value and, similar to a debit card or credit card transaction, credits the merchant the good funds less a fee.

The adoption of these products is critically dependent on the willingness of purchasers, consumers, and merchants to compensate providers and processors of these prepaid products. In figure 5, we diagram a hypothetical example to illustrate which types of transaction fees that may be involved, as well as which participants might bear the costs, when using nonreloadable general-purpose prepaid cards.²⁰ Generally, there is a fee associated with putting value on the card. In our example, the activation fee is \$5.00 regardless of the amount of prepaid value bought, with the consumer facing no fees for using the card. Assuming that the consumer makes a \$100 purchase in our example, the merchant pays \$1.25 to its financial institution. This fee is similar to what the merchant would pay for a \$100 signature-based debit card transaction. The merchant’s financial institution then pays a fee of \$1.00 to the prepaid value issuing institution. This fee is similar to the interchange fee that the merchant’s financial institution pays a card issuer for a signature-based debit card transaction.

Prepaid value issuers may impose additional fees to the ones discussed previously. Some general-purpose prepaid card issuers impose dormancy fees (\$2 to \$3 per month when the card is not used for six to 12 months), reissue fees (\$7.50 to \$15 for replacing lost, stolen, or expired cards), and ATM fees (approximately \$2.50 for cash withdrawals at ATMs). Industry sources report that issuers face significant marketing and customer support costs that need to be recouped from various types of fees. We will next explore a few payment segments in which general-purpose prepaid cards are being offered and the benefits to payment system participants.

General-purpose gift cards

General-purpose gift cards enable recipients to buy goods and services from a greater number of merchants than retailer-specific cards. The NRF estimates that general-purpose gift card sales totaled \$5 billion in 2004 (eFunds Corporation, 2005). Most payment

industry observers agree that card usage fees are critical factors driving adoption of general-purpose gift cards. Financial institutions have been generally reluctant to issue general-purpose gift cards for a variety of reasons—most notably, the lack of consumer interest and lower profit margins relative to other payment cards (SourceMedia Inc., 2005a).

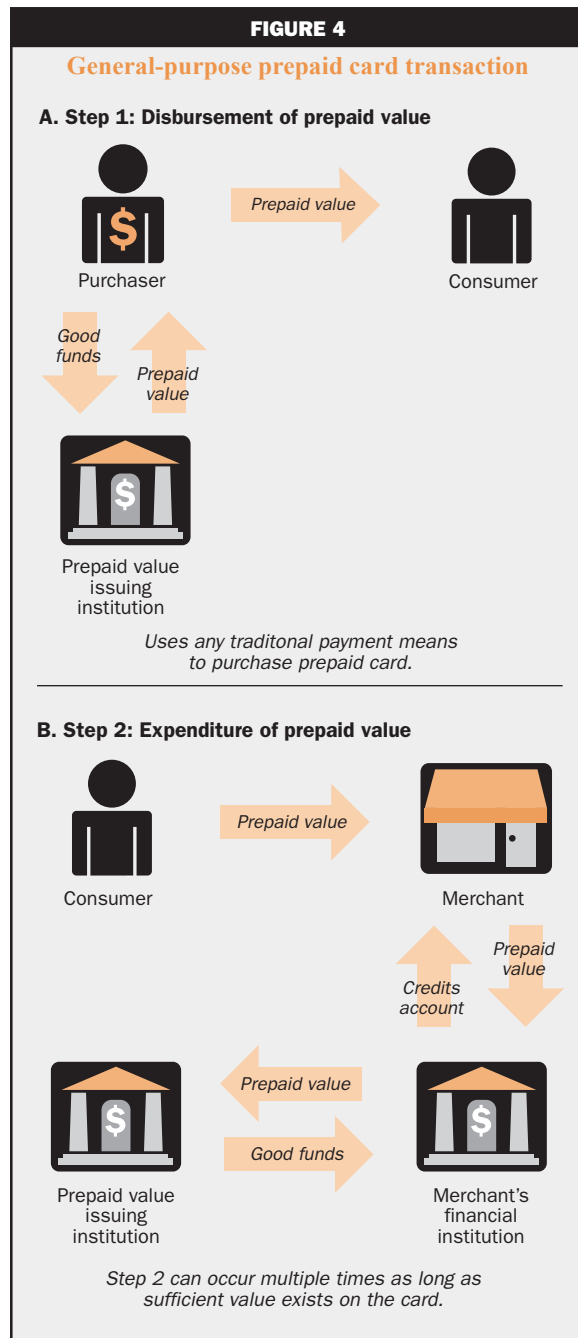
However, while general-purpose card transaction fees may be necessary for financial institutions to offer them, purchasers may be less likely to buy them if they or their gift card recipients face high transaction fees relative to other payment products. In most cases, purchasers of general-purpose gift cards are usually individuals giving gift cards to other individuals. Generally, individuals pay each other with paper-based instruments. Furthermore, individuals usually pay little or no per transaction fees when they pay by check or cash.²¹ While most gift givers prefer existing payment instruments, such as checks and cash, for unrestricted gift giving, there are some gift givers who prefer to give general-purpose prepaid cards because their benefits from giving these cards are greater than the costs of the cards.

Payroll cards

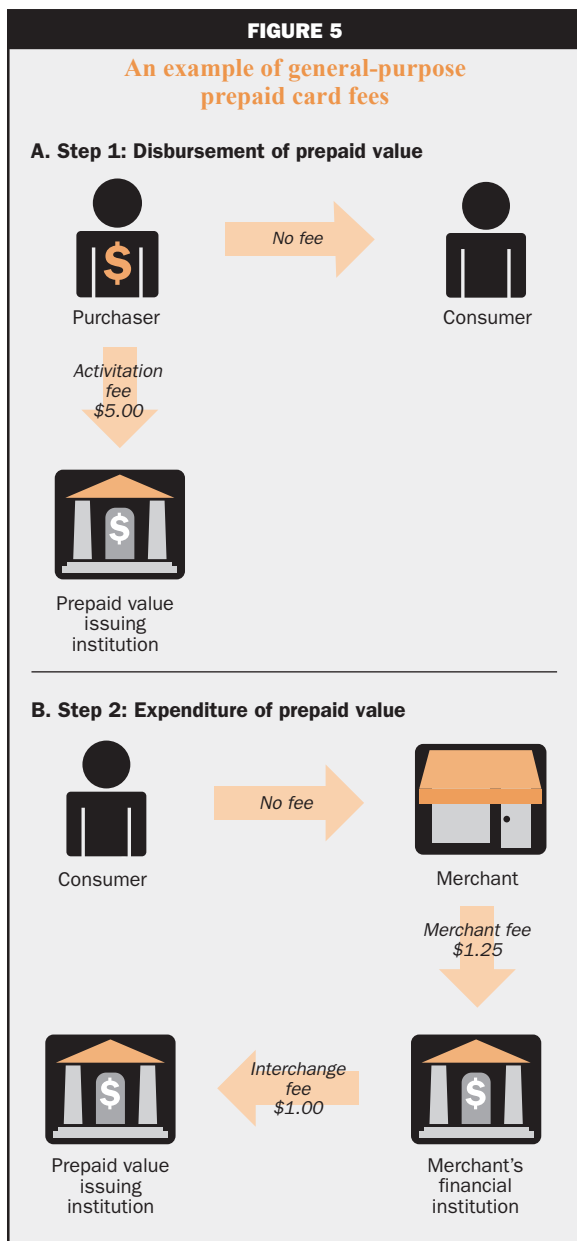
Whereas gift givers and recipients may be unwilling to pay fees imposed by general-purpose prepaid value issuers, some employers and employees may be more willing to bear the costs of payroll cards, a type of general-purpose prepaid card, because of the relatively higher cost of using alternative payment instruments. Payroll cards, also known as paycards, have emerged as an electronic substitute for payroll checks. In 2004, there were approximately 2.2 million payroll cards in circulation and approximately \$29 billion worth of transactions were performed (Lucas, 2005; Cheney, 2005).

Traditionally, employers have disbursed wages in two ways: with ACH direct deposits of funds into employees' bank accounts or with paper-based payroll checks. Approximately 70 percent of U.S. private sector employees and nearly all U.S. federal government employees receive their salaries or wages electronically via an ACH credit payment (National Automated Clearing House Association, 2005). In panel A of figure 6, we diagram an ACH credit payment made by the employer to an employee. The employer instructs its financial institution to make an ACH credit payment to the employee's financial institution. Upon receiving good funds, the employee's financial institution credits the employee's account.

Most employers favor ACH payments because the cost of paying employees electronically is significantly less than the cost of paying them by check. In fact,



some employers only pay their employees via ACH payments. On each payday, employees are able to access their funds to pay for goods and services or to acquire cash. While employees may pay fixed costs to maintain transactions accounts or pay implicitly in terms of forgone interest on their transactions account balances, employees do not generally pay explicit fees to receive ACH credit payments. Once the funds are deposited to the employee's account, purchases



In panel B of figure 6, we diagram a check transaction where an employee uses an alternative financial service provider, such as a check cashing institution, to convert the paycheck into cash.²³ Note that unlike an ACH payment, the employer must deliver the check to its employee.²⁴ The employee then cashes the check, usually for a fee. Once the employee receives cash, the employee may pay for money orders to make bill payments. The Office of the Comptroller of the Currency (OCC) estimates that an employee who cashes two \$400 checks at a check casher per month and purchases three money orders for bill payments will spend \$246 per year, or \$20.50 per month (Frumkin, Reeves, and Wides, 2005).

Payroll cards are linked to accounts that are owned by prepaid value issuing institutions, which are funded by employers each pay period.²⁵ In panel C of figure 6, we diagram a payroll card transaction. After the payroll cards are distributed, the funds can be accessed by the employee either at the point of sale to buy products or services or at an ATM to withdraw cash. New cards are issued only when employees enroll in payroll card programs or when cards are lost or stolen.

Payroll cards may offer significant cost savings for employers and employees versus other payment alternatives, and they may offer revenue possibilities for financial institutions. Employers benefit from offering payroll cards by reducing their payroll administration costs. The employer's cost to load a paycard is, on average, less than \$0.25 (Davidson, 2004). Employees benefit from using payroll cards because the cost of accessing good funds is significantly lower than the cost of cashing checks. Some payroll card holders are charged monthly maintenance fees of \$1.50 to \$4, ATM transaction fees up to \$2.50, and POS fees of \$0.25 to \$0.50 per transaction (Mayer, 2004). Industry estimates of the annual cost of payroll card ownership is around \$79 (Cheney, 2005).²⁶ In addition, employees who use payroll cards receive access to good funds sooner than those who receive payroll checks. Prepaid value issuing institutions are also able to earn fee income from payroll cards—for example, from ATM and POS fees.

The underlying economics of general-purpose prepaid cards is compelling for some employers and employees because the cost of processing, distributing, and cashing payroll checks is greater than the cost of using paycards. Payroll cards are similar to an account-based payment instrument in terms of the employee's ability to buy goods and services using a relatively secure payment instrument. In addition, paycards are generally issued once and reloaded each pay period, resulting in a steady flow of revenue for financial institutions from the same customer base without new

can be made with account-based instruments, such as checks or debit cards.

Industry sources estimate that 60 million U.S. residents receive their pay via paper checks (Cheney, 2005). There are several reasons why employees receive checks instead of ACH payments. First, employees without transactions accounts are unable to receive their wages via ACH credit payments.²² Second, even employees with transactions accounts may prefer to receive their wages via checks and deposit them at their financial institutions or cash them at check cashers. Third, some employers do not offer disbursements of wages via ACH credit payments.

setup costs that may be present in other prepaid applications, such as general-purpose prepaid gift cards.

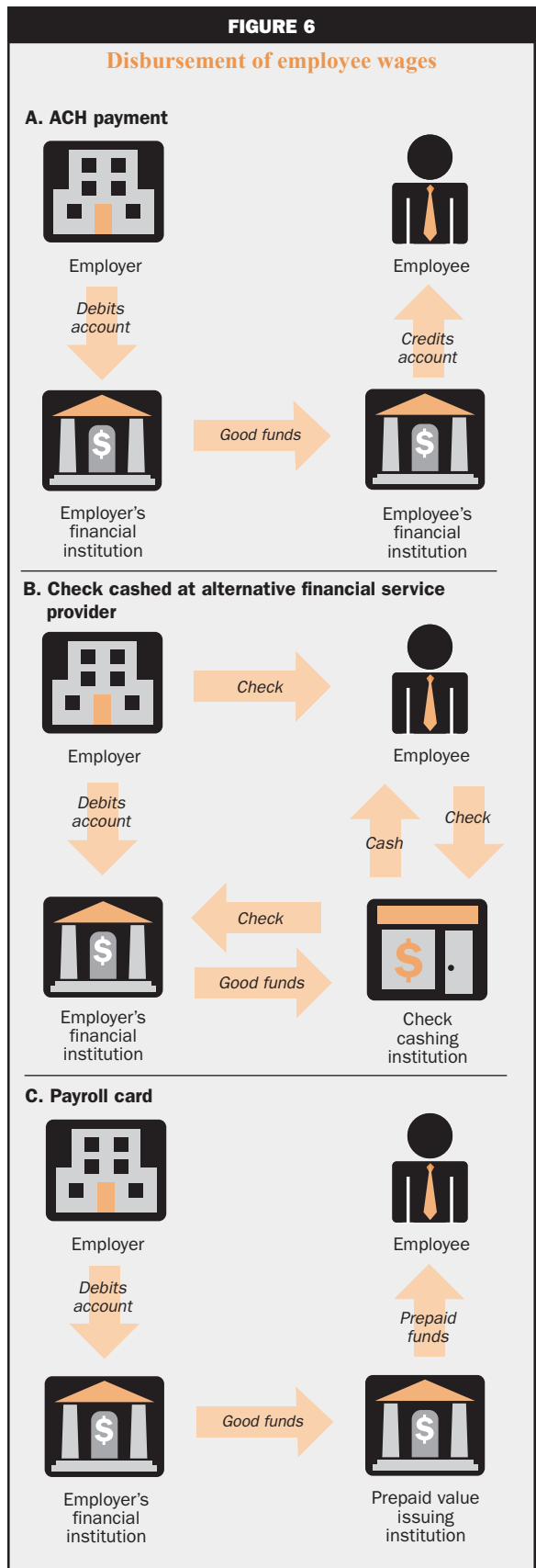
Employer-initiated benefit cards

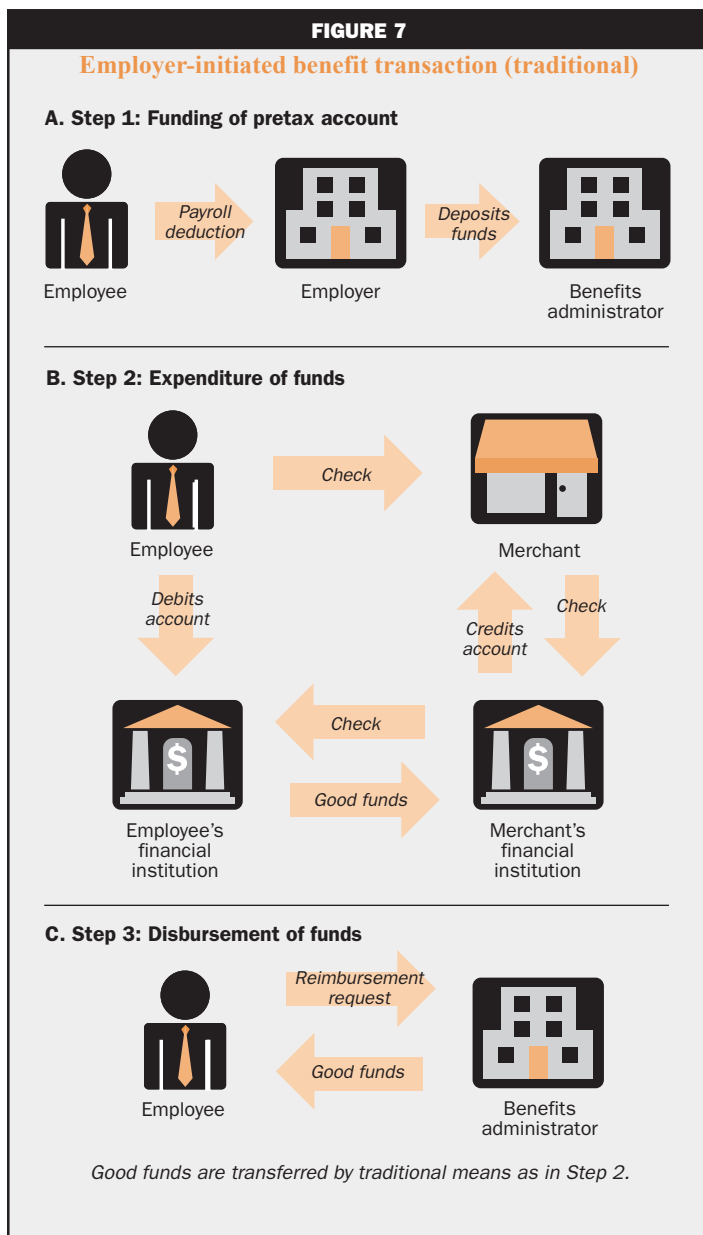
Some prepaid card applications are gaining traction because they enable disburers of funds to restrict recipients' purchases more efficiently than paper-based alternatives. Most employer-initiated benefit cards are examples of a restricted-use prepaid card application. These cards offer benefit administrators better control over cardholders' spending and significantly reduce or eliminate costly paper-based verification while offering employees more streamlined access to their pretax spending accounts.

In 2003, the U.S. Internal Revenue Service (IRS) approved linking payment cards to pretax employee benefit accounts, such as flexible spending accounts (FSAs). FSAs enable employees to pay for qualified health care expenses that are not covered by insurance, for example, deductibles and co-payments. Employees contribute funds to FSAs through pretax salary deductions. In general, employees must determine their contributions before the beginning of the year and forfeit any unused funds at the end of the year. According to industry estimates, there are 18 million FSAs with approximately 2.7 million of them linked to FSA general-purpose prepaid cards (SourceMedia Inc., 2005b). These cards are linked to approximately \$2 billion worth of value (Nipple, 2004).

Before FSA prepaid cards, the processing of FSA reimbursements was generally paper intensive. In figure 7, we diagram the three steps that employees must follow to use their pretax dollars for qualifying expenses. In step 1, the employer deducts funds from the employee's pay and deposits the funds with the plan administrator. In step 2, the employee buys qualifying goods and services, using traditional payment means, such as cash, check, or debit card. In step 3, the employee requests reimbursement from the benefits administrator. Upon verifying that the purchases qualify, the administrator reimburses the employee. This process is less convenient for employees because they may wait for as long as a month to receive reimbursement checks.²⁷ Furthermore, consumers pay twice before receiving reimbursement—first, when funds are deducted from their paychecks and, second, when they pay for medical products and services at the point of sale.

Alternatively, employers may offer FSA prepaid cards through their benefit administrators.²⁸ In figure 8, we diagram an FSA prepaid card transaction. In step 1, the employer deducts funds from the employee's pay and deposits the funds with the benefits administrator. Unlike in figure 7, the benefits administrator





then deposits the funds at a prepaid value issuing institution that issues the employee's prepaid card. In step 2, the employee is able to make qualifying purchases. The retailer or health service provider is able to receive good funds through its financial institution for the prepaid value submitted by the employee. These providers pay merchant discounts similar to those that are paid for signature-based debit card transactions. The time-consuming paper-based verification step is eliminated.²⁹

FSA cards offer benefit administrators various advantages, such as lower processing, distribution,

and administration costs. These programs are generally favorable for employers because when employees contribute pretax funds to health care benefit accounts they reduce their taxable incomes, which lowers their employers' salary tax liabilities. Providing a more streamlined reimbursement process may encourage more employees to utilize FSAs. Employees benefit from greater convenience and direct access to their FSAs. In addition, employees save time because they do not submit paper claim forms to plan administrators.³⁰

Government benefit transfers

In 1996, the U.S. Congress passed the Debt Collection Improvement Act that required electronic disbursement of most federal payments beginning January 2, 1999. In 2003, the U.S. government disbursed \$1.3 trillion, and approximately 78 percent of this sum was paid electronically (U.S. Census Bureau, 2006). Most government electronic benefits transfers (EBT) are performed through ACH credit payments. Currently, prepaid cards are being used to disburse benefits to those without transactions accounts, as well as for benefits that restrict the types of purchases that can be made with those funds. Prepaid cards allow the federal government to meet its mandate to disburse funds electronically.

Prepaid government benefit cards address the cost and security challenges associated with paper-based transfers. The cards enable disbursements to deliver benefits more efficiently, thereby reducing the cost of delivering program benefits.

In 1994, a federal EBT task force estimated the annual savings to the federal government would be close to \$195 million from the issuance of EBT cards, a form of prepaid cards (Humphrey, 1996). Benefit cards are more effective in reducing fraud than paper-based alternatives. Recipients are able to redeem their benefits within a day of electronic disbursement. Also, recipients face lower prepaid card usage fees (in some cases, none) than check cashing fees.

Examples of prepaid applications

In this section, we discuss three specific applications of prepaid products and how each application benefits the payment participants. We consider a

retailer-specific gift card, a payroll card, and the card-based food stamp program administered jointly by the federal and state governments.

Starbucks Coffee Company

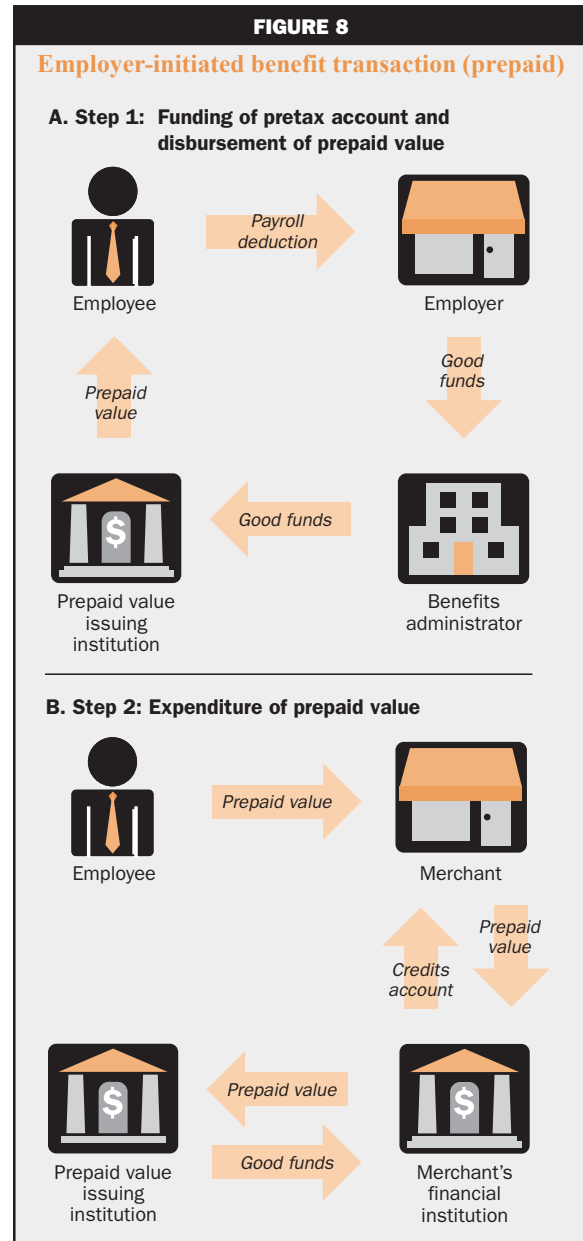
Starbucks Coffee Company, the worldwide chain of coffee houses, introduced a prepaid card in November 2001, primarily to reduce the processing costs of previously issued paper gift certificates.³¹ Approximately 35 million Starbucks gift cards have been sold, with \$1 billion of value loaded on them, from 2001 to 2004 (Starbucks Coffee Company, 2005). Starbucks cards account for around 12 percent of sales. Gift giving has been a critical factor to the success of the card. Between 60 percent to 80 percent of the activity on these cards results from users receiving the cards as gifts.

As consumers migrate from cash payments to electronic alternatives, Starbucks has been able to lower some of its payment processing costs. Transaction costs are important to Starbucks because the company receives millions of payments monthly and most are valued at less than \$5 each. Consumers use signature-based debit cards or credit cards for up to 25 percent of their purchases (Chakravorti and Jankowski, 2005). While Starbucks' cost of accepting cash payments is nearly one-third of accepting credit cards or signature-based debit cards, the cost of its prepaid card is less than cash.

Starbucks prepaid cards have enabled the coffee house chain to increase revenue by attracting new customers and enhancing the loyalty of existing customers. Unlike most consumers who discard their gift cards after their initial use, one out of three Starbucks card holders reloads value on the cards, suggesting these cards are more convenient for some Starbucks' customers than other payment options. The average value loaded when a card is activated is \$14, and approximately \$25 is reloaded on each card.³² The company reports that electronic payments, including prepaid cards, provide some speed of service benefits. The coffee house chain is able to accept prepaid card payments faster than cash, thereby reducing customers' wait times.

U-Haul International

As we discussed previously, payroll cards may offer an effective alternative to paper-based checks for employers of individuals who do not have transactions accounts or individuals unwilling to give access to their accounts. U-Haul International—a self-service moving business that rents trucks and trailers and sells moving supplies and services—employs 18,000 people across 16 states, and many of



them are unbanked. The company began offering payroll cards to its employees in November 2001 and reported savings of up to \$500,000 from reduced payroll check volumes by the following year.³³ Today, U-Haul no longer issues payroll checks, and approximately 17 percent of its employees use payroll cards.

Electronic payments have enabled U-Haul to reduce its payroll administration costs. Five months before U-Haul first offered payroll cards, 57 percent of U-Haul employees received payroll checks. U-Haul paid its bank a per item fee of \$0.25 to process each payroll check (Hielscher, 2004). Furthermore, the

company incurred costs to reissue checks when they were lost. Industry estimates for reissuing checks, including express deliveries to employees, range from \$10 to \$12 per check (Adams, 2005).

After implementing its payroll card program, U-Haul reduced its bank fees for payroll disbursements to approximately \$0.07 to \$0.10 per payroll transaction. The company saved \$60,000 by eliminating overnight delivery of reissued payroll checks. As a result of a less labor-intensive payroll process, U-Haul was able to reduce its payroll administration staff from 15 to 11 (Stewart, 2004).

U-Haul employees who switched from payroll checks to prepaid cards also benefited because they experienced quicker and less costly access to funds. Previously, some employees waited up to four days after payday to receive their paychecks (Mayer, 2004). If employees cashed their checks at check cashing outlets, they likely paid an average surcharge of 3 percent of the check's value (Kiviat, 2003). When U-Haul employees switched to payroll cards, they had quicker access to their funds on payday. Although employees may be charged payroll card maintenance and transaction fees, access to funds is less costly because aggregate fees are lower than check cashing fees. U-Haul payroll card holders receive one free ATM cash withdrawal per week and incur \$1.50 per transaction fee if more withdrawals are made that same week. Furthermore, POS debit transactions are free (Institute of Management and Administration, 2004). Therefore, U-Haul employees who used to cash two \$400 paychecks and purchased three money orders for bill payments per month for \$20.50 would pay significantly less if they switched to payroll cards—assuming that they only make one free ATM withdrawal per week, make free POS debit transactions, and pay an average payroll card monthly maintenance fee within industry norms.

The financial institution that issues U-Haul payroll cards also benefits from the company's migration to electronic payments. The financial institution earns income from explicit payroll card and funding fees and may earn additional revenue from cross-selling other payment products to U-Haul employees and U-Haul itself.

The Food Stamp Program

The Food Stamp Program is an example of the federal and state governments providing benefits to qualifying individuals to make certain types of food purchases.³⁴ Food stamp benefits were disbursed to close to 24 million people, totaling approximately \$24.6 billion in 2004 (U.S. Department of Agriculture,

Food and Nutrition Service, 2006). For over 30 years, food stamp benefits were distributed via paper-based coupons, redeemable primarily at grocery stores. Prepaid electronic benefits transfer (EBT) cards were introduced in Pennsylvania in 1984 as an electronic substitute for paper-based food coupons and were adopted by all states in 2004.

Prior to the introduction of EBT cards, the process for distributing food stamps and redeeming their value was more cumbersome for participants. Food stamps were distributed by mail to the recipients or collected by them at local benefit offices. The redeemed food stamps were processed by banks and physically presented to the issuing agency or paying agent, often a Federal Reserve Bank. Funds were transferred from the disbursers to the banks, and they were then transferred from the banks to the merchants that accepted the payments from the consumers.³⁵

It is difficult to determine cost savings resulting from the shift to prepaid cards, given that many food stamp programs converted to EBT recently. While industry experts report that larger states had a net cost savings from the substitution of EBT cards for paper coupons, the evidence for smaller states is not as clear. The implementation of new technologies is often associated with relatively high fixed costs that may require years to recoup. Most industry experts agree that the substitution of paper-based food stamps with EBT cards has significantly reduced fraud, a significant cost component for the previous paper-based coupon system.

Recipients also benefit from electronic disbursement of food benefits. They redeem the value of their benefits faster with EBT cards than they did with paper-based food stamps with no additional cost. Benefit recipients receive access to food benefits within a day of electronic disbursement. Previously, recipients waited for a few days to receive their food stamps. Federal and state governments continue to bear all food stamp costs.

Merchants of food products that permit purchases with EBT cards are better off by accepting EBT cards than paper-based food stamps. Previously, merchants waited for few days after accepting food stamps before receiving good funds. The introduction of EBT cards and subsequent elimination of food stamps reduced the time required to receive good funds.

The successful migration from paper to electronic delivery of food stamp benefits has spurred government agencies to utilize existing payment card networks to disburse benefit payments. Prepaid cards are now being used, along with checks, to deliver benefits to

those in the TANF (Temporary Assistance to Needy Families) Program and the WIC (Women, Infant, and Children) Program, as well as other child-care assistance and child support payments programs.

Conclusion

While general-purpose prepaid cards may have been initially introduced as substitutes for cash transactions, today, they are also substituting for checks. Although prepaid cards are able to serve some key niche payment segments, such as gift, payroll, and employer-initiated and government benefit programs, it is unlikely that they will be able to significantly substitute for electronic account-based or credit-based payment products. Prepaid applications potentially provide a more cost-effective means to transfer funds when:

1) recipients of funds do not have transactions accounts; 2) disbursers of funds do not have access to the recipient's transactions accounts; or 3) the disbursers of funds need to restrict where and on what the underlying funds can be spent. As with other payment instruments, all payment system participants need to be on board to spur adoption.

Payment innovations are generally more successful when they utilize existing infrastructure and initially target profitable niche markets. General-purpose prepaid cards usually utilize existing payment networks to clear and settle transactions. In addition, in most cases, linking the merchants' acceptance of general-purpose prepaid products with other more familiar payment products offered by the same payment network allows issuers of prepaid value to provide greater value to consumers. Also, in some cases, general-purpose prepaid cardholders are able to access ATMs to withdraw cash, allowing consumers to convert prepaid value into an almost universally accepted payment instrument.

Profitable niche markets are those in which the cost of existing payment options to some participants is sufficiently high to justify the introduction of a new payment instrument. The growth of general-purpose prepaid cards is dependent on transactors' benefits and their willingness to pay for the provision of services. Adoption of prepaid cards in niche markets may result in increased familiarity and confidence among payment system participants to spur even wider adoption of such products for other payment segments.

NOTES

¹For a discussion about business-to-business payments, see Chakravorti and Davis (2004) and Lubasi (2005b).

²During the Free Banking Era (1837–63) in the United States, private sector banks issued paper currency. For more details, see Rolnick and Weber (1988) and Schreft (1997).

³There is counterfeit risk, but this is generally small. The level of counterfeit U.S. notes worldwide is between 0.01 percent to 0.02 percent (U.S. Department of State, Bureau of International Information Programs, 2003).

⁴Whitesell (1992) builds a theoretical model describing the usage of various payment instruments based on the dollar value of different types of transactions.

⁵For more details about I-PASS, see Amromin, Jankowski, and Porter (2006).

⁶For more details about the Navy Cash Card, see Van Hove (2005).

⁷Humphrey (2004) reports that in addition to replacing cash transactions for consumer payments, employee disbursements, and smaller-value business purchases, checks were used until 1915 for large-value business transactions and interbank transfers. After 1915, these transactions were and continue to be settled today via Fedwire, the large-value payment system operated by the Federal Reserve System.

⁸Merchants accepting checks face the risk that the funds may not be available when the check is presented to the consumer's financial institution. The risk that a payment cannot be converted to good funds is called settlement risk. Merchants can utilize various

resources to reduce this risk—for example, check guarantee services, nonsufficient funds fees, and databases identifying accounts that are not in good standing.

⁹Note that checks paid differs from checks written because some checks are converted to ACH payments at the point of sale or at retail lock boxes.

¹⁰In an ACH debit transaction, the payee's financial institution initiates the funds transfer from the payor's institution. Similar to checks, ACH debit payments may be denied because payors do not have sufficient funds in their accounts. In an ACH credit transaction, the payor's financial institution initiates the funds transfer to the payee's financial institution. Unlike ACH debit payments, ACH credit payments are only initiated when payors have sufficient funds in their accounts or have access to overdraft facilities.

¹¹There are two types of debit card transactions—ones authorized by PIN (personal identification number) and ones authorized by signature. For more details, see Lubasi (2005a).

¹²Interchange fees are fees paid by merchants' financial institutions to payors' financial institutions. These fees exist on credit card and debit card transactions. For more details, see Chakravorti (2003), Chakravorti and Shah (2003), and Lubasi (2005a).

¹³For a theoretical model highlighting the benefits of credit for both consumers and merchants, see Chakravorti and To (1999).

¹⁴For the purposes of its Payment System Development Committee industry roundtable, the Federal Reserve defined prepaid cards as those for which the value resides in a remote database. When the value is recorded on the cards, then they are called

stored-value cards (Board of Governors of the Federal Reserve System, 2005). In this article, we abstract from this difference and refer to both types of cards as prepaid cards.

¹⁵Most of the theoretical economic analysis suggested that prepaid cards would substitute for small-value cash transactions (Santomero and Seater, 1996; Shy and Tarkka, 2002). However, we argue that prepaid cards also substitute for account-based payment instruments.

¹⁶For more details on retailer-specific prepaid cards, see Van Hove (2005).

¹⁷Some industry participants strongly caution against interpreting estimates of the size and potential growth of the prepaid card market. For example, Tescher (2006) states: “An incredible number of consultants and analysts have churned out research on [the prepaid card market’s] size, growth, and potential, yet no one in the industry believes the numbers are right.”

¹⁸Based on discussions with industry participants, many retailers no longer impose expiration dates on their gift cards. When retailers do impose expiration dates, consumers are generally given up to two years to use the value without penalty.

¹⁹Chakravorti and Kobor (2005) argue that payment innovations are generally more successful when they utilize existing payment infrastructure.

²⁰There are also reloadable cards that allow prepaid value to be loaded in the future.

²¹There are checking accounts that impose per check fees. In most cases, financial institutions impose monthly fees or minimum balance requirements instead of per check fees. Furthermore, financial institutions generally charge for ATM withdrawals for individuals that are not their customers but do not usually charge their own customers. Some economists have advocated cost-based pricing, under which consumers would pay fees to induce them to use more cost effective instruments including prepaid cards (Van Hove, 2004b).

²²Bucks, Kennickell, and Moore (2006) report that slightly over 10 percent of U.S. households do not have checking accounts. The top three reasons given by these households for not having checking accounts are: They do not write enough checks; they do not like to deal with banks; and they do not have enough money.

²³For the purposes of this example, we assume that the check cashing institution is not the employee’s or employer’s financial institution.

²⁴In cases where the employee works remotely, the physical delivery of checks can be time-consuming and costly.

²⁵There are also payroll cards that use the ATM infrastructure. These cards are not as widely accepted as those that use payment networks that clear and settle signature-based debit cards.

²⁶This cost estimate assumes weekly payroll, four ATM withdrawals per month, and four purchases per month.

²⁷Alternatively, the benefits administrator may make an ACH payment resulting in substantially less time for an employee to receive the funds.

²⁸Employers may choose to pay all or part of the cost of prepaid FSA cards.

²⁹Some health insurance companies are sending documentation for qualifying purchases to FSA administrators, who then pay employees if funds are available in their FSAs.

³⁰However, sometimes plan administrators may request supplemental documentation, such as itemized product invoices, to verify the eligibility of purchases.

³¹Richard Lautch, vice president and treasurer at Starbucks Coffee Company, described the Starbucks prepaid card experience at the 2005 Chicago Fed payments conference, titled “Innovations, Incentives, and Regulation: Forces Shaping the Payments Environment.” A summary of his comments can be found in Van Hove (2005).

³²In 2003, Starbucks introduced the Duetto card, a dual purpose card that functions as a prepaid card at Starbucks stores and as a credit card elsewhere. Duetto cardholders load approximately 40 percent more value on their cards than ordinary Starbucks gift cardholders (Simpson, 2004).

³³See Institute of Management and Administration (2004). A portion of the \$500,000 savings is attributed to reducing W-2 paper statements.

³⁴Although food stamps no longer exist, the name of the federal and state government programs is the Food Stamp Program. There are discussions to change the name.

³⁵For more information about federal and state government benefit disbursements before the introduction of EBT cards, see Humphrey (1996).

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