

perspective on payments

Electronic payments networks benefit banks, businesses, and consumers. Why do so few use them?

By Joanna Stavins

Twenty years ago, depositing a paycheck at a bank was an exercise in patience. Long lines snaked through bank lobbies as hundreds of customers per day waited to deposit their money. This routine was a fact of life for every worker, every government check recipient—indeed, everyone who received checks regularly. Today this is no longer a Sisyphean task, and one major reason is the automated clearinghouse (ACH).

ACH systems are meant to facilitate small, repeated financial transactions between businesses and consumers. Using ACH, employers can electronically submit paycheck deposits directly into their workers' bank accounts rather than writing paper checks. Likewise, mortgage lenders, utilities, and other businesses that bill the same customers repeatedly can receive payments automatically.

Clearinghouse transactions are becoming increasingly popular in the United States.



PAPER CHECKS are more expensive to process than electronic payments, but getting users to switch takes coordination



More than 5 billion payments (including both debits and credits) were made by ACH in 2000, comprising 8 percent of all noncash transactions and 12 percent of the total dollar value of transactions that year. Over half of American households have the option of direct deposit available for either salaries or federal benefits payments, and this proportion has been growing at 15 to 20 percent annually over the last several years. Eighty percent of Americans eligible for Social Security receive their benefits electronically, largely due to federal legislation mandating direct deposit for most payments made by the U.S. Treasury. Direct payment of bills is still relatively less common, but electronic transactions have been making inroads here, too; nearly 30 percent of insurance payments and over 20 percent of loan payments are made electronically.

Despite this progress, ACH usage is nowhere near as high as in Europe, where in some countries as many as two-thirds of payments are completed electronically. Why are American banks, businesses, and consumers so slow to adopt ACH?

THE ELECTRONIC PAYMENTS DECISION

One reason Americans might use electronic payments less frequently could be that at current prices, we simply prefer checks to electronic transactions. While check transactions are significantly more costly for banks to process than electronic payments on a per-item basis, the prices consumers pay for bank services typically do not reflect this. Thus, the cost of using a check, from a consumer's perspective, does not include the full transaction costs as the check winds its way through the payments system. For consumers, even a free electronic transaction is only slightly cheaper than a check, and checks are more familiar and perceived as more reliable and trustworthy. And banks fear losing customers by forcing them to abandon the comfortable check and move toward electronic payments. As a result, nearly 60 percent of payments are made by check.

But my recent research with Gautram Gowrisankaran shows that low electronic payment usage may be due to more than just preference. It may also result from the difficulty individual users face in calculating the full costs and benefits of implementing a payments network, particularly in the decentralized banking structure in the U.S. Market incentives may not be sufficient to encourage users to adopt ACH, even though ACH is cheaper than paper checks for the system as a whole.

The problem starts because joining an electronic payments network is costly. About three-quarters of electronic payments are made through FedLine (the Federal Reserve System's electronic network, which among other things facilitates ACH transactions). To participate in FedLine, financial institutions

must invest in a dedicated PC, modem, printer, a special security card for encryption, and special ACH processing software. After the installation, banks must invest significant resources in training their employees to use the system, and they must pay a substantial monthly user fee. Furthermore, banks cannot simply abandon the old check clearing infrastructure when they adopt ACH, since not all transactions will occur electronical-

and constantly changing, it is impossible for banks to know how much they will gain if they put an electronic payments network in place. They might invest in one anyway if the cost of implementing the decision were low or if they could be certain that all of their competitors will also be joining. But the existence of a network externality means the market provides little incentive for banks to join the network by themselves, since oth-

Electronic payments systems are risky investments because the initial costs are known, but the payoff depends on user participation

ly. So investing in ACH results in additional expense, not a replacement for current expenditures.

Nonetheless, one might expect this to be a relatively simple business investment decision: invest in an ACH network if its benefits exceeds its costs, don't invest if the costs outweigh the benefits. But in this case, the costs are relatively easy to calculate, whereas the benefits are not. An electronic payments network increases in value as the number of other users increases. (Economists call this a network externality.)

In this situation, if a bank decides to adopt a particular electronic payment technology, this benefits other banks that already use it because they can then directly exchange payments with another institution. Likewise, network customers benefit when more patrons sign on, since this increases the acceptance and availability of the system and helps new customers to learn about its benefits.

Because the benefits of electronic payments are both indirect

ers' behavior affects the full return on their investment. Thus, banks tend to delay implementing electronic payments until they are compelled to by competition or by regulation.

MEASURING NETWORK EXTERNALITIES

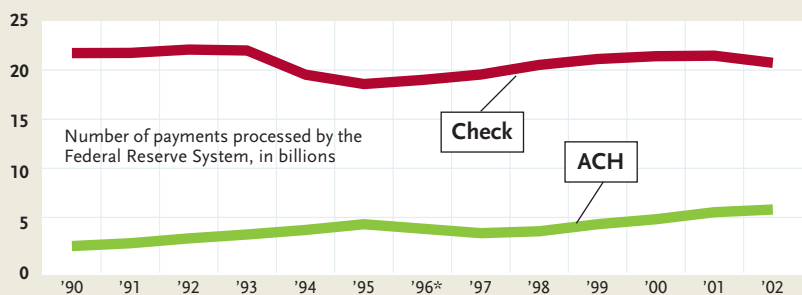
Network externalities are common for technical products and services that improve communication. Imagine, for instance, how useless Alexander Graham Bell's telephone would have been without Thomas Watson to answer it. More recently, the expansion of the fax machine and email were both slowed by the fact that both technologies were not very useful until they were sufficiently widespread. Coordinating technology adoption is especially difficult across businesses, particularly when the institutions to be networked are decentralized. The decision to lay phone lines, for instance, was easier when AT&T was the sole provider of telephone service. As a monopolist, AT&T could much more easily calculate the benefit of extending service than if it also had to consider the potential effects of the infrastructure investment decisions of its competitors.

While the existence of network externalities is clear in theory, measuring their impact has been difficult in practice. For one thing, with high technology goods, price and costs generally decrease over time. It is hard to identify whether increasing demand for the product is due to the network benefit from having more users or simply due to the lower prices. The ACH system, however, provides an opportunity to separate these effects because the Federal Reserve's prices are set in advance once or twice a year and thus are less directly affected by changes in demand.

But measuring the benefits of ACH still requires solving the problem of the proverbial chicken and egg. The probability that Bank A adopts ACH is affected by how many of its competitors also use it,

Still writing checks

Increased direct depositing of paychecks and a federal mandate to disburse many payments electronically have fueled growth in the ACH market. But ACH still lags far behind checks in transaction volume.



*ACH volume accounting method changed.
SOURCE: Board of Governors, Federal Reserve System

Did Blockbuster kill Betamax?

but the probability that a competitor adopts ACH depends on Bank A's choice. Gowrisankaran and I dealt with this problem by asking ourselves three questions. Are banks more likely to invest in ACH technology if other banks geographically near it also have ACH? Are larger banks or banks with few local competitors more likely to invest in ACH, since they are not waiting for others to adopt ACH before they adopt it themselves? And are small independent banks more likely to adopt ACH if a larger bank with a branch in its geographic area has already done so?

We found evidence of network externalities in all three scenarios. A 10-percentage-point increase in the number of banks with ACH capability in a local area increases the probability of adopting ACH by an estimated 4 to 9 percentage points for a bank that otherwise would have had a 50/50 chance of investing in electronic payments technology. These results hold even after controlling for other factors that might influence adoption rates, like changes in prices, differences in technology, or trends in electronic payment usage over time.

POLICY IMPLICATIONS

If network externalities are significant—as our evidence suggests they are—then everyone would be better off if more banks used electronic payment networks. But while banks react to the costs and benefits they face individually, they do not have the information or incentive they need to also account for the increasing value of the payment network as more institutions join it. As a result, they underinvest in networking technology.

Network externalities can also explain the difference between European and American ACH usage. Europe's relatively centralized banking structure makes it much easier for banks to coordinate on an electronic payment system. They do not need to worry as much that they will invest in a system that later loses value due to lack of participants.

Greater adoption of ACH technology would have several other important benefits for the U.S. It would reduce the cost of payment transactions, since electronic payments are cheaper to process than checks even after considering the cost of maintaining the old check clearing system. It would foster economies of scale in the ACH system, further reducing the marginal cost of electronic transactions. And if more institu-

When ACH was initially developed, the Federal Reserve System stepped in to implement a single communications standard for all transactions. But for other industries, arriving at a common standard in the face of network externalities is more challenging. The legendary battle between Betamax and VHS is a case in point.

The first home video recording system, Betamax, was introduced by Sony in 1976; rival Matsushita Electric came out with the Video Home System (VHS) a year and a half later. The two product designs, though based on a common ancestor, were just different enough that the videotapes on which material was recorded were incompatible. This set the stage for a showdown over the home video market.

Technological improvements like increased playing time, enhanced picture quality, and additional features came so quickly that neither product was able to establish a definitive edge over the other in that regard. But Sony was less effective in getting other VCR manufacturers to license its technology, and Matsushita's simpler design and willingness to incorporate licensees' suggestions facilitated mass production. As a result, the VHS standard began to develop a small advantage in licensing its technology to leading color TV manufacturers—who were key to expanding the VCR market because of the complementary nature of the products and their brand-name cachet.

Yet even in 1980, nearly 40 percent of VCRs were still Beta models. But that was before the rise of the video rental store. Before then, most people used their VCRs to play back television shows they had recorded themselves. For the most part, people did not share tapes, so there was less need to have one standard tape format.

The growth of the video rental industry, however, depended on choosing a single standard to avoid duplication and save costs. VHS's slight market advantage led many stores to invest in the VHS format, believing that it would ultimately become the industry standard. Sony couldn't compete in the new environment. As a result, what started as a small edge for VHS spiraled into market dominance. After years of declining sales, Sony finally bowed out of the Beta market in 1988.

tions joined the ACH network, its value to its current participants would increase.

In a decentralized banking market like the U.S., network externalities mean that the process of ACH adoption will likely proceed more slowly than it would in a more centralized environment. It could, however, be hastened by initiatives to improve awareness of the benefits. For instance, in May 2003 the Federal Reserve System will be rolling out a campaign highlighting the benefits of ACH for consumers and companies as part of National Direct Deposit and Direct Payment Month. The Fed could also foster greater coordination among banking institutions in its supervisory and regulatory role to help overcome the problems of a decentralized market. With these types of efforts in place, the benefits of an electronic payment system can be fully realized. *

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