

The Evolution of Shared ATM Networks

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Ever since Philadelphia National Bank installed the nation's first automated teller machine in 1969, the number of consumers accessing their bank accounts through ATMs has increased dramatically. One reason for ATMs' frequent use is that most are part of a shared network—that is, a network that links together a number of banks and their customers.

Only a few shared networks existed in the

1970s, but the number grew quickly right up until the late 1980s, when consolidation eliminated nearly half of them. This consolidation has allowed the remaining networks to expand both geographically and in terms of number of machines, significantly improving the quality of services provided.

The increasing concentration of ATM transactions in the largest networks has raised the issue of anticompetitive behavior. So far, however, competition among ATM networks continues. Nevertheless, both state and federal antitrust authorities continually monitor the practices of ATM networks for evidence of anticompetitive actions.

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GLOSSARY

Automated Teller Machine (ATM) - A machine used for banking services, including withdrawals or deposits, balance inquiries, transfers, and other services. Customers access an ATM by using their debit cards, and the transactions are processed electronically with the aid of computer information systems.

Consumer Fees - The fees customers pay to use ATMs. Consumer fees for ATM use are not uniform; they are determined by the customer's bank, not by the ATM network. Many banks offer certain checking accounts, often with high minimum balances, that include ATM use at no charge. Many accounts, however, do charge the customer a fee for each ATM transaction.

Debit Cards - Also known as access cards, debit cards are plastic cards encoded with electromagnetic identification. The banks issue them to customers upon approval of their applications. Customers can insert the card in an affiliated network ATM to obtain account information and cash.

Duality - The name given to the interchange agreement between the two national networks, Plus and Cirrus. Under this agreement, a member of one can accept cardholders from the other at no additional fee.

Foreign Fees - A transaction fee charged the customer for using another institution's ATM. Typically, foreign fees are higher than the transaction fee customers pay to use their own bank's ATMs.

Gateway - An electronic channel between two networks.

Interchange Fee - Also known as terminal income, an interchange fee is a fee paid to the owner of an ATM by a network member whenever that member's cardholders use an ATM. The fee is typically set by the network and currently ranges from 40 cents to \$1.

ATM NETWORKS ENHANCE CONSUMERS' CONVENIENCE

A *network* is a common way of delivering a product or service that increases the product's value by linking many customers together. For example, the value of a telephone network to customers increases with the number of customers that can be reached via the network. Similarly, ATM networks link together banks in various locations, giving the customers of each institution greater access to their bank accounts.

ATM networks started as proprietary networks of single banks, accessible only by a single bank's customers. Often located within branches of banks, ATMs served as substitutes for human tellers. They were intended to

improve service quality in branches, and in this they were successful. Lines for tellers shrank, and, in some cases, customers were provided access to their accounts 24 hours a day.

Soon, banks realized that, by sharing ATMs, they could spread the costs of the machines and network facilities over many more customers and transactions while giving customers enhanced access to their accounts. As a result, banks created shared ATM networks (see *Glossary*), usually as joint ventures of banks within various regions of the country.¹ The national

¹See Paul Calem, "Joint Ventures: Meeting the Competition in Banking," this *Business Review* (May 1988). Of the 20 largest regional shared ATM networks today, 13 are jointly owned by a group of banks and seven are owned by a single

Interchange Transaction - A transaction in a shared ATM network in which a cardholder of one member bank uses another bank's ATM.

Point-of-Sale (POS) Network - A network of banks, point-of-sale cardholders, and merchants that permits an immediate electronic funds transfer from the bank account of the cardholder to the account of the merchant.

Network Switch - The electronic equipment that receives and transmits transactions between the bank that operates the ATM and the bank that holds the customer's account and issues the card used in the transaction.

Proprietary ATM Network - An ATM network owned and operated by one depository institution and accessible only to that institution's customers.

Reciprocal Sharing Agreement - An interconnection agreement between regional ATM networks that allows the networks to conduct interregional transactions directly rather than route them through a national network.

Shared ATM Network - An ATM network accessible to multiple depository institutions' customers.

Surcharge - A direct charge to ATM users assessed by the owner of the ATM. Surcharges, which are charged only rarely, range from 15 cents to \$1.

Switch Fee - A fee charged by the network for the use of its switch. Typically, it is paid by the bank that holds the customer's account. The fee ranges between 2 cents and 25 cents per transaction, depending on the network and the volume of transactions originated by the member bank.

networks came later, in the early 1980s, and were designed for "long-distance" ATM transactions.

Sharing Provides an Expanded Service. Before shared ATM networks, banks had to build

firm. ATM networks serve either a particular region of the country—such as the MAC network, which serves the Mid-Atlantic and Northeast regions—or the entire nation. There are only three national networks: the two largest networks, Plus and Cirrus, and one smaller network, the Exchange. Currently, the vast majority of ATM transactions are carried out within regional networks. For earlier discussions of shared ATM networks, see Steven D. Felgran, "Shared ATM Networks: Market Structure and Public Policy," in *New England Economic Review* (January 1984), and Felgran and R.E. Ferguson, "The Evolution of Retail EFT Networks," *New England Economic Review* (July 1986).

branches in order to enhance their customers' geographical access to bank accounts. However, branching had only limited success in expanding customer service. Banks were prohibited from branching across state lines, and many states imposed limits on branching within their boundaries.² The advent of shared ATM networks, however, meant that one bank's customers could use another bank's ATMs, even if they were located across state lines. (See *Typical ATM Network Transactions*, p. 6.)

²In 1987, for example, eight states restricted banks to having a single office, and 18 other states allowed only limited branching.

Typical ATM Network Transactions

Illustrated here are the possible links between two shared regional networks, "Eastnet" and "Frontier"; a shared national network, "Union National"; and member banks. Besides transactions fees, networks charge membership fees on an annual basis, as well as fees based on the number of cards the member bank issues. The fees used in these examples are actual fees of shared ATM networks.*

A typical shared regional ATM network transaction:

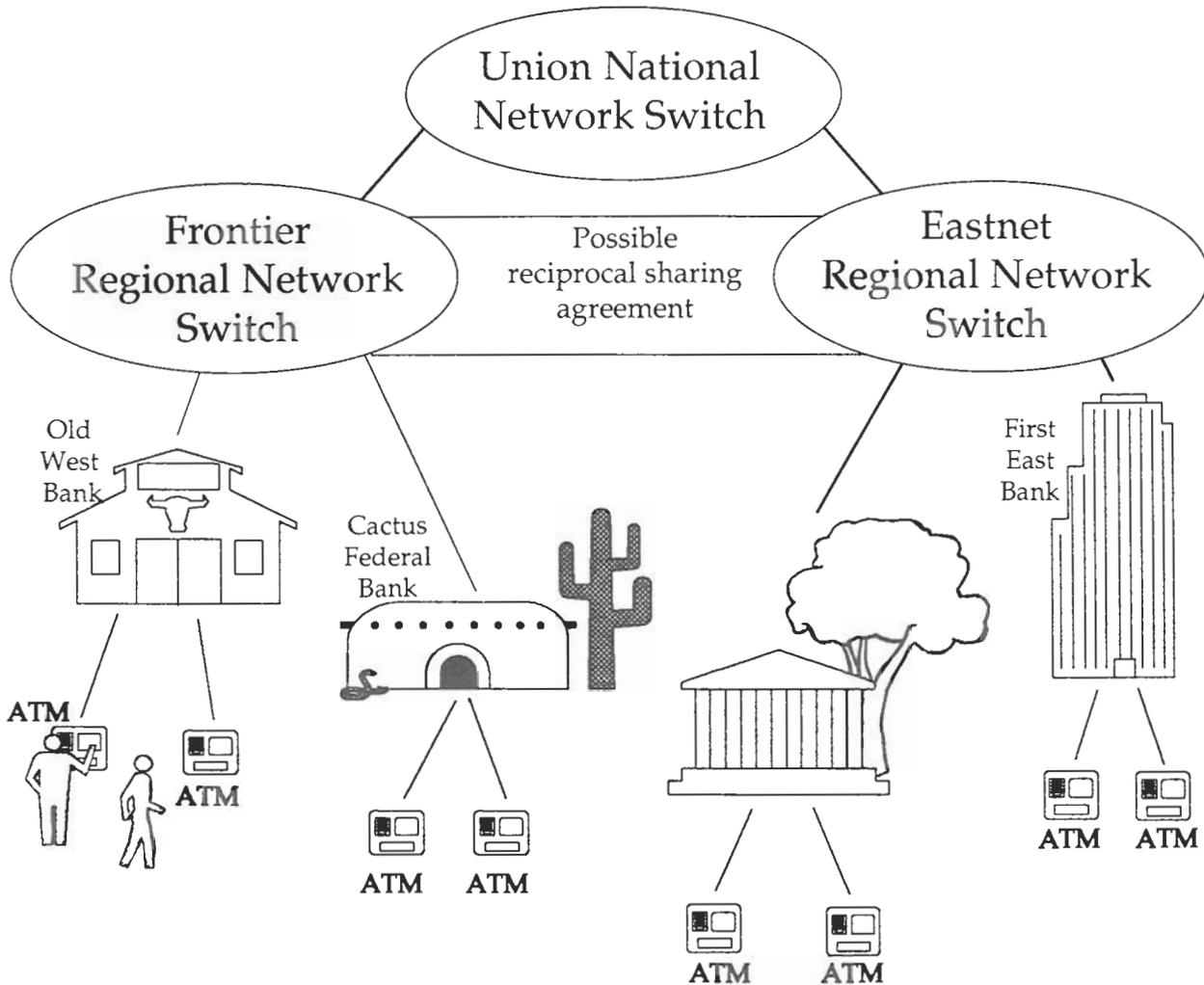
Penelope O'Malley, a customer of First East Bank, wants to withdraw some cash from her account. She uses the nearest ATM, which happens to be owned by Yankee Bank, and her debit card, issued by First East, to initiate the transaction. Both First East and Yankee Bank are members of the Eastnet regional network. The Eastnet regional switch relays the necessary account information and approval to First East and back to Yankee Bank. The transaction is approved, and Penelope gets her cash.

First East must pay the Eastnet network a switch fee of anywhere between 2 and 10 cents for processing the transaction. In addition, First East must pay Yankee Bank a 40-cent fee, called the interchange fee or terminal income, set by the Eastnet network, to compensate Yankee Bank for having deployed the machine and the cash that Penelope received. First East Bank itself may charge Penelope a transaction fee, of 25 cents, just for using an ATM. (Some banks do not charge transactions fees to customers who meet special requirements—for instance, customers who maintain high minimum balances in their accounts.) If First East charges Penelope a higher fee—say 50 cents—it's because she used a network ATM not owned by First East; this higher fee is typically called a foreign fee. And, finally, Penelope may, in rare circumstances, be charged directly by Yankee Bank for using its ATM. Yankee Bank charges from Penelope's account at First East a fee, called a surcharge, which may be as high as \$1. Banks set the consumer fees independently of the network and other network members; the network sets the switch fee and the interchange fee.

A typical national ATM network transaction:

Since her bank is a member of the Union National ATM network, Penelope can obtain cash from any ATM displaying the Union National logo. Suppose she is traveling on the West Coast and wants to withdraw cash from an ATM owned by Cactus Federal, a member of both the Frontier and Union National networks. Once again, the necessary account information and approval are relayed between her bank, First East Bank, and the bank owning the ATM, Cactus Federal. Because these banks have only the national network in common, the national switch relays messages back and forth through gateways provided by the regional switches, Eastnet and Frontier. In this case, First East Bank pays a national switch fee of 5 cents to the national network—plus regional switch fees, which may amount to about 20 cents, both to its regional network, Eastnet, for providing the gateway to the national switch, and to the receiving regional network, Frontier. First East also pays Cactus Federal an interchange fee, set by the Union National network, of 50 cents. In effect, then, First East had to pay three switch fees to carry out Penelope's national network transaction.

*The fees depend on the transactions volume of a bank's customers. The fees presented here are not meant to reflect the average cost of an ATM transaction, but to give the reader an idea of the approximate size of the ATM network fee.



An interregional transaction if there is a reciprocal sharing agreement:

If Eastnet and Frontier have a considerable amount of traffic between their networks, it may pay them to establish a reciprocal sharing agreement that allows them to create a channel between themselves and bypass the national switch in interregional transactions like Penelope's. In this case, First East Bank would pay a total of only 70 cents (as opposed to 75 cents when using the national network), of which 40 cents would go to Cactus Federal as the interchange fee and the remaining 30 cents would be shared by Eastnet and Frontier, to compensate them for the switching and for the channel they had to create in order to carry out the shared transactions.

A key legal decision ratifying this practice was the Marine Midland decision of 1984, in which a Federal Appeals Court held that an ATM is not a branch of a bank. By deciding that network ATMs were not branches of national banks, the court allowed banks to expand access to their customers through network ATMs without being bound by the restrictive prohibitions on branching.

A shared ATM network can expand access to a customer's account in at least two ways. First, geographically diverse member banks, having deployed ATMs for their own depositors, offer use of their machines to other banks' depositors. Second, and perhaps more important, sharing encourages deployment of ATMs at new locations.

For example, consider the deployment of an ATM at a commuter train station. Suppose that the customers of 10 banks pass through the station and that any one bank's customers will generate 1000 transactions per month. Suppose further that it requires 3000 transactions a month for the ATM machine to break even. Without sharing, no machine will be put in place. But with a shared network of all 10 banks, there is a strong incentive to place a machine at such a busy public place because, in addition to serving its own depositors, the ATM owner can earn interchange revenue when other banks' customers use the ATM.

The Expanded Service Represents a Network Externality. A network externality is a boost in the value customers place on a product or service as its network of users expands. For example, a new bank and its customers, by joining a shared ATM network, create a network externality for all the existing ATM network members by allowing them to access their accounts at more locations. The larger cardholder base in the expanded network makes deployment of new ATMs more profitable, which further enhances the accessibility of existing members' accounts. The larger the network, the more convenient are the ATM loca-

tions, and the more the customer values membership in the network.

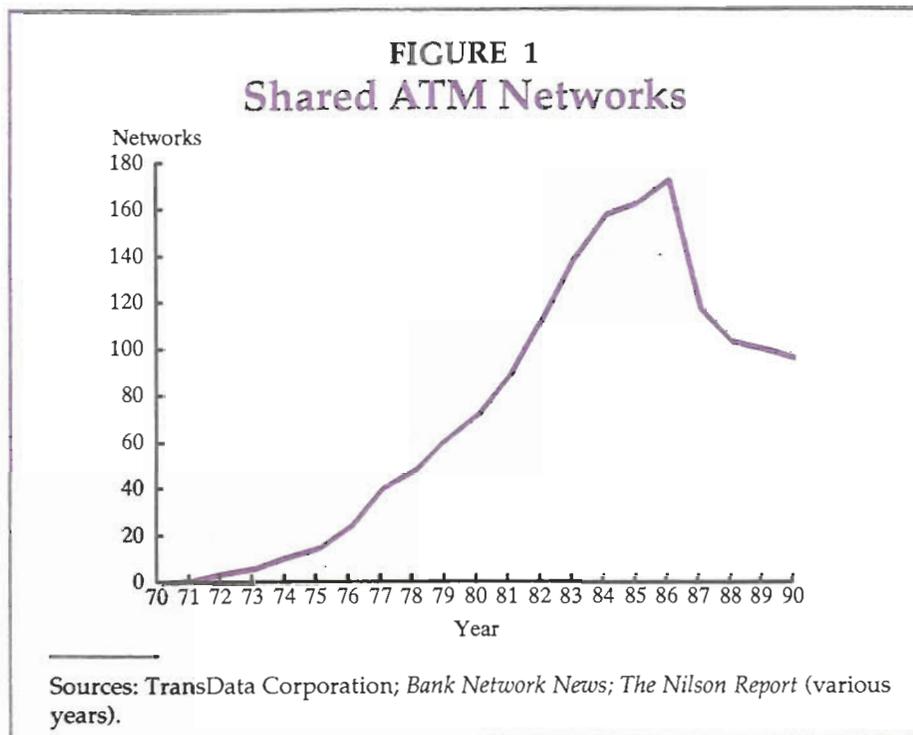
Network externalities occur in the provision of many goods and services. Besides the telephone industry, other beneficiaries of network externalities include credit cards and other payment systems, fax machine networks, train systems, and computer software. Each product increases in value as the network of users becomes larger.

Because an expanded network increases the value of the product, its customers are willing to pay more for it. This greater willingness to pay for the good or service—combined with lower per-unit costs that economies of scale generate for larger networks—creates a surplus that will be shared between the producers and the consumers. Since a growing network can generate a surplus, producers of goods and services that create network externalities have an incentive to expand their network, up to the point when either the network externality or the economies of scale disappear and no additional surplus is generated by expansion.

THE GROWTH AND CONSOLIDATION OF SHARED ATM NETWORKS

As more and more financial institutions recognized the benefits of sharing, the number of shared regional ATM networks increased rapidly, peaking in 1986 at almost 200. Since then, consolidation—mergers and outright purchases of one network by another—has nearly halved the number of regional networks, to about 100 (Figure 1).

Meanwhile, the number of ATMs has continually increased, rising from less than 10,000 machines in 1978 to approximately 80,000 in 1990, one for every 3000 people. The steady increase in the number of transactions and ATM debit cards in recent years reveals that the ATM transaction has become a common way for people to access their bank accounts. It is estimated that half of all U.S. households use ATMs at least once a month.³ Furthermore,



although the number of shared ATM networks has declined in the past several years, the activity of existing networks has increased steadily.

Plus and Cirrus, the largest national networks, began as joint ventures in 1982, some 10 years after the regional networks. Banks around the country recognized that travelers would benefit from being able to access their bank accounts even when away from home. Accordingly, the number of transactions in national networks has grown rapidly in recent years.⁴ (See *ATM Transactions and Card Growth*, p. 10.)

Increasing Concentration. The concentra-

tion of network activity has risen even more than we would expect based on the consolidation of networks. Indeed, the largest networks are transacting an increasing share of ATM activity. While in 1982 the top 20 regional shared networks accounted for about 15 percent of all regional shared network transactions, today they account for over 90 percent, and the top six account for 60 percent.

The drop in the number of networks stems from two factors: 1) the formation of new

shared networks has slowed; and 2) mergers and acquisitions have reduced the number of existing networks.

Reduced Entry. In the early 1980s, all the ATM networks were small, and the many new entrants to the market did not face the prospect of formidable competition—in other words, the presence of very large, well-known networks. As these large networks evolved, they reduced the incentive for others to form new networks. Consequently, while about 20 new networks entered the market per year in the first half of the 1980s, this rate of entry slowed to about five per year in the last half of the 1980s.

Mergers Concentrate Network Activity. Some of the increase in the largest networks' relative size is due to internal expansion, but much of it owes to mergers and acquisitions. In 1989 and 1990, at least 18 shared networks were either acquired by other networks or merged into a new network. An example is the recent merger of the Honor, Relay, and Avail networks into the Southeast Switch network. Among regional networks, Honor, Relay, and

³"Teaching ATMs New Tricks," *American Banker*, December 3, 1990.

⁴Other national networks that link ATMs, but do not provide access to customers' bank accounts (in other words, they are not used with bank access cards), include the Visa network, which links 17,897 machines, and Express Cash, which links 16,100 machines. And finally there is the Exchange, a third national network, though it is much smaller than either Plus or Cirrus.

ATM Transactions and Card Growth

Year	Monthly Regional ATM Transactions (millions)	Monthly ATM Volume in Cirrus, Plus, and Exchange (millions)	Debit Cards (millions)
1978	41.0	0	NA
1979	63.5	0	NA
1980	100.0	0	NA
1981	135.0	0	NA
1982	167.0	0	60.0
1983	200.0	0.1	74.6
1984	261.0	0.5	100.0
1985	296.0	1.4	130.0
1986	301.0	2.6	140.0
1987	335.3	3.6	152.0
1988	375.3	7.1	170.9
1989	422.2	12.2	183.9
1990	474.9	19.6	191.4

Sources: Bank Administration Institute; *Bank Network News*; Cirrus System, Inc.; Plus System, Inc.; *The Nilson Report*; TransData Corporation (various years).

people will be willing to pay for it—networks have an incentive to expand. In doing so, they can hope to capture at least some of the surplus created through higher revenue, generated in part because more transactions are routed through the network switch. Facing competition for depositors, banks wish to offer their customers membership in the best network available. If one network in the region has many member banks and many ATM locations while another network has few members and locations, then the bank that has decided to offer its customers debit cards would prefer membership in the first network, other things equal.

There is a tendency for a network, if it gains some small advantage over a rival network, to benefit from a “bandwagon effect” that increases its size and further enhances its initial advantages.⁵ As these large networks evolve, they create barriers to market entry. By offering their members the benefits of lower switch fees due to economies of scale,

Avail ranked eighth, ninth, and fourteenth, respectively, in transactions volume in 1990. The merged network would have ranked fourth.

WHY CONSOLIDATION HAS OCCURRED

Consolidation has occurred mainly for three reasons: 1) the presence of network externalities; 2) economies of scale; and 3) relaxed barriers to interstate banking.

Network Externalities Create Incentives for Larger Networks. Because of network externalities—the wider the network, the more

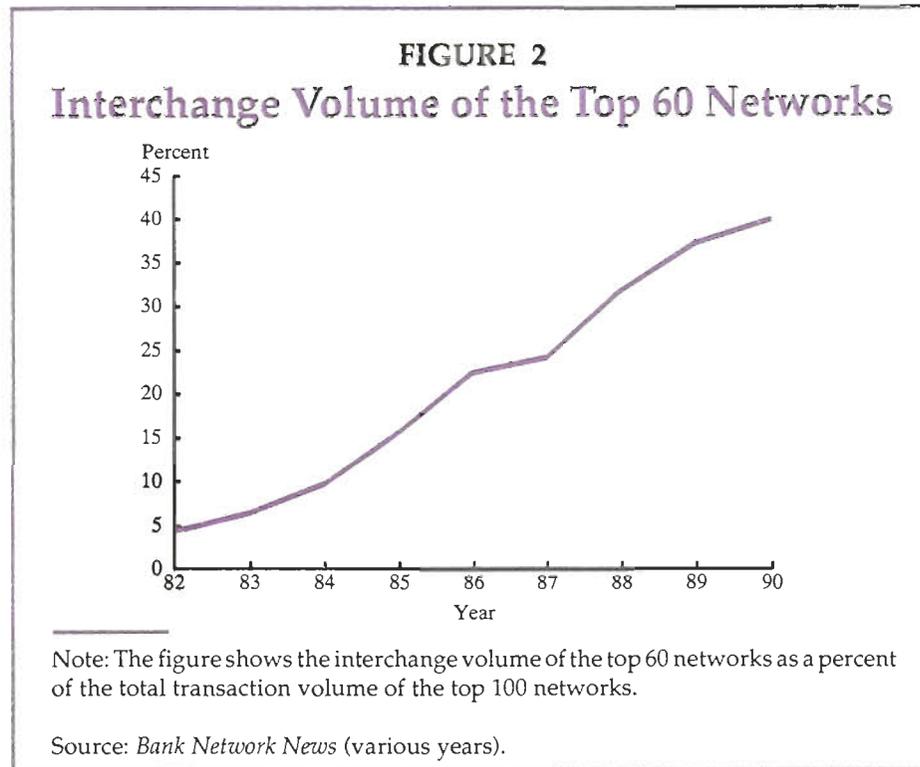
⁵See Joseph Farrell and Garth Saloner, “Standardization, Compatibility, and Innovation,” *Rand Journal of Economics* 16 (1985) for a model and discussion of the bandwagon effect.

increased interchange due to greater network externalities, and name recognition among consumers, they can stifle other networks' attempts to enter the market.

The importance of this incentive to expand an ATM network can be measured by the number of "interchange" transactions, which occur when the customers of one bank access their accounts through another bank's ATM. As the number of interchange transactions increases, the revenues from the network

"switch fee" rise. The percentage of ATM network transactions that are interchange transactions has increased dramatically as ATM activity has become more concentrated in the largest networks (Figure 2). The reason is that the larger networks are able to provide a more convenient service that yields more network activity.

Large Networks Can Take Advantage of Economies of Scale. Every network must have computer equipment and standards by which a transaction is "switched," or processed. These resources are subject to economies of scale—as more banks join the network and more transactions are routed through the switch, the cost per transaction drops. In fact, the switch fees of networks have declined as the networks have grown larger, which provides evidence of this effect.⁶ A clear example of reduced switch fees



due to economies of scale has been the Plus network. Having charged a 10-cent switch fee since its inception, this national network eventually lowered the fee to 5 cents per transaction in 1989 after its transaction volume had grown sufficiently large.

Interstate Banking Has Spurred Network Consolidation. Today, many states offer some form of interstate banking, and bank holding companies have been quick to cross state lines by purchasing or organizing a new subsidiary bank.⁷ But as banking organizations entered a new state, they frequently found that a different network was prominent. The result was that banks often had to join both networks, resulting in duplicate membership fees and different formats for transactions—a strong incentive for consolidation. The merger of the

⁶See "The Switch Fee Elevator: 'Going Down,'" *Bank Network News*, February 10, 1990.

⁷For a review of interstate banking legislation, see Paul Calem, "Interstate Bank Mergers and Competition in Banking," this *Business Review* (January 1987).

southeastern networks Honor, Relay, and Avail into the Southeast Switch is a prime example of this incentive's effects. The southeastern states have allowed regional bank holding companies to cross state lines for many years. By merging the networks, the multistate banking member can use a standard format and avoid competing with itself.

WILL NETWORK CONSOLIDATION CONTINUE?

It is difficult to judge how extensive network externalities and economies of scale are for shared ATM networks. In some network industries, such as the telephone industry, consolidation led to a single monopoly firm. In others, such as the credit-card industry, multiple firms compete.

National Network Duality. The Plus and Cirrus networks concluded an agreement of interconnection, popularly known as "duality," in 1990. Under this agreement, an ATM owner, by belonging to only one of the two networks, can service the cardholders of either network without having to pay additional membership fees. As a result, "long-distance" ATM service may soon be available through a single network, since not all ATM owners have yet taken advantage of duality. This network now represents a more credible competitive threat to regional networks, since a bank could drop membership in, say, a high-fee regional network and be a member only of the national network. Since most ATMs in the country are owned by banks that are members of either Plus or Cirrus, the bank would still be able to offer its customers convenient service. As a result, depending on the costs of providing quick and efficient service, the national network could ultimately displace regional networks.

Regional Networks Continue to Merge. The merger of regional networks is a continuing trend. Increasingly, single networks are coming to dominate the ATM market in a city or region. A good example is the MAC net-

work, the only regional network in the Philadelphia area.

In addition to consolidation, many regional networks have made bilateral interconnection agreements. These agreements allow one network's customers to use another network's machines without the customer's bank incurring both a national and a regional switch fee. A recent survey estimates that the number of transactions conducted under such agreements grew by 50 percent between 1989 and 1990.⁸

By expanding the size of their effective network, the interconnected regionals can more successfully rebuff competition from another network. In particular, through either consolidation or bilateral interconnection, the regional networks can give the national network increased competition, since the interchange traffic between the regional networks can effectively bypass the national switch. These agreements are limited to networks that have a sufficiently large volume of transactions flowing between them to support developing both a channel between the networks and the methods to process the transactions.

PUBLIC POLICY CONCERNS

Weighed against the obvious benefits of shared ATM networks are concerns about non-competitive behavior by network industries. While joint ventures among competing firms often result in superior service to the public, they always raise questions of collusion in pricing and of attempts to exclude other competition from entering the business. A dominant network can extract a large share of the benefits of network externalities through monopolistic pricing and restrictions on membership.

Discriminatory and Exclusive Membership Practices. One practice considered anticom-

⁸"Network-to-Network Links Build Transactions," *Bank Network News*, October 11, 1989.

petitive is discriminatory access to the network, such as allowing a small bank to join only if it pays an exorbitant membership fee unrelated to the cost of membership; the small bank, in order to offer its customers the convenience that other banks offer theirs, would probably be willing to pay a high fee. Also considered discriminatory is the fact that most ATM networks restrict membership to depository financial institutions, even though money-market mutual funds and brokerage firms could offer many of the same services through ATMs. These other types of firms could conceivably start their own ATM networks; however, if an ATM network of depository institutions becomes the dominant network, then entry would be difficult owing to the bandwagon effect, and the other institutions may be denied access to an important method of delivering services.

Another practice that can be anticompetitive is exclusionary membership: forbidding a network member from simultaneously joining another network. Before duality, for example, the Plus network forbade its members from belonging to Cirrus. Regional ATM networks, however, allow their members to also join a national network, which reduces the concern about this particular anticompetitive practice.

In October 1990, the Plus network proposed a rule that some regional networks believe may be anticompetitive.⁹ It requires that any transaction carried out between two regional networks whose only logo in common is Plus (on both access card and machine) be routed through the Plus switch. The routing requirement reduces the regional network's ability to engage in reciprocal interconnection, discouraging this type of competition. The rule on transactions routing is a type of exclusionary

clause in that Plus is requiring the transaction to be routed through the national switch even if the two regional networks involved can more efficiently route the transactions directly. Because of the regional networks' criticism of the rule, its implementation has been postponed pending further discussions with the regional networks.¹⁰

Anticompetitive Pricing Practices. If one network charges an extremely low fee for its services in the short run, it may—thanks to the bandwagon effect—be able to establish a dominant, or even monopolistic, position by attracting a large base of members from other networks. Once it establishes its monopoly by engaging in predatory pricing, it could then raise prices to a high, noncompetitive level. Compared to a competitive network, a monopoly network can set prices to extract a larger share of its service's benefits. But entry into the industry would be deterred nonetheless, since no entrant could offer a prospective member a large base of other members.

Public Policy in Action. U.S. antitrust laws provide penalties for networks found to be engaging in anticompetitive practices. In 1985, a Justice Department official, in outlining Justice's views on shared ATM networks, stated that the agency would not attempt "to apply limitations to the structural evolution of the industry."¹¹ However, the official pointed out that anticompetitive practices by networks *would* be cause for limitations on their behavior. The Justice Department and the Conference of State Attorneys General monitor shared ATM networks to determine if a particular practice warrants an antitrust action. To date, there

⁹See "Plus Establishes a Routing Rule," *Bank Network News*, October 26, 1990, and "Plus's Routing Rule Faces An EFT Baptism By Fire," *Bank Network News*, November 10, 1990.

¹⁰See "Plus Takes a Routing Rule Time-Out," *Bank Network News*, January 26, 1991.

¹¹See "Remarks of Charles F. Rule, Acting Assistant Attorney General, Antitrust Division, Before the Federal Bar Association and the American Bar Association," May 23, 1985.

have been few instances of regulatory action against ATM networks. (See *The Bandwagon Effect: Plus, Cirrus, and Entree* for a case in which several states brought suit alleging violations of the antitrust laws in an allied electronic funds transfer network.)

Because of the interconnection of the Plus and Cirrus systems, the Conference of State Attorneys General has stated it will be closely monitoring the behavior of these two national networks for anticompetitive practices.¹² The Attorneys General expressed concern that duality would stifle technological developments, reduce ATM deployment, and result in higher prices. They have decided, however, not to obstruct the duality agreement on antitrust grounds.

Meanwhile, the same group is concerned about national networks engaging in predatory pricing that encourages banks to bypass regional networks. In 1988, an assistant attorney general of New York State expressed concern that Visa was engaging in predatory pricing when it offered to process the transactions of several southeastern ATM networks for 2 cents per transaction—a level far lower than the transactions fees charged at that time.¹³ (The offer was not accepted.) Significantly, however, a great deal of information is required to judge whether a particular pricing practice is anticompetitive.

Additional laws at the state level—called mandatory-sharing laws—assist in preventing anticompetitive practices.¹⁴ By the mid-1980s,

more than 20 states had enacted laws requiring a shared ATM network to allow membership, at a reasonable fee, of any financial institution seeking to join. The mandatory-sharing laws reduce the network's ability to engage in discriminatory membership practices and to charge excessive fees. Although the laws do not define a "reasonable" fee, a financial institution could take the network to court if it had evidence that the network's fees were unreasonable. The network, then, must stand ready to justify its prices in court.

If a monopoly ATM network *were* to develop, we may expect policymakers to create a regulatory agency that oversees the system's prices, much like state public utility boards regulate prices charged by gas and electric utilities. To date, however, no direct regulation of prices has been implemented.

CONCLUSION

The billions of transactions carried out each year by shared ATM networks are indisputable evidence that these networks have greatly enhanced the convenience of basic banking services. The ability of shared networks to offer a new service—geographically convenient access to bank accounts at a substantially lower cost—has spurred the creation and growth of networks at both the regional and national levels.

National network duality has led to the possibility of an interconnected national network, although that has not happened to date; in many regions of the country, a single network transacts most ATM activity. Network consolidation will likely continue at the regional level through mergers and interconnection with other networks.

The consolidation overall has been due to the incentive producers have to expand the networks. The wider the network, the more customers will be willing to pay for it, which in turn creates a surplus to be shared by network and consumer alike.

¹²From a letter by Kenneth O. Eikenberry, Attorney General of Washington, to Plus and Cirrus, August 13, 1990.

¹³See "Trustbusters Spear Entree and More," *Bank Network News*, August 11, 1989.

¹⁴To learn more about the effects of mandatory-sharing laws, see Elizabeth S. Laderman, "The Public Policy Implications of State Laws Pertaining to Automated Teller Machines," *Federal Reserve Bank of San Francisco Economic Review* (Winter 1990).

The Bandwagon Effect: Plus, Cirrus, and Entree

Plus began in the 1970s as the proprietary network of Colorado National Bank. Originally, it positioned itself as a processor of ATM transactions for other banks in the region. Then, in the mid-1970s, Colorado National decided to include shared ATMs, creating the Rocky Mountain BankCard system. By 1979, more than 15 percent of the banks in Colorado, New Mexico, and Wyoming had joined the network. In 1982, the network saw the need for a national network, and 26 banks from around the nation incorporated the Plus System, Inc.

Cirrus, too, was formed in 1982, when a group of 12 large banks around the nation also saw a need for a national ATM network. Both Cirrus and Plus were quickly organized, and both were in operation by 1983.

In February 1987, Visa acquired an ownership interest in Plus, and in January 1988 MasterCard acquired Cirrus. In June 1987, Visa and MasterCard, with the assistance of Plus and Cirrus, agreed to jointly develop a point-of-sale (POS) system called Entree. A POS system is an on-line method for merchants to receive payment from their customers. A shared POS system, like a shared ATM system, allows many banks' customers to use the POS machine at the merchant's site. The system directly debits the customer's bank account and provides payment to the merchant.

By February 1989, more than 170 banks had joined the planned network, representing a potential card base of 17.8 million. However, few merchants had been introduced to the program.

With the creation of Entree, several states in July 1989 filed suit against Visa and MasterCard, alleging intent to monopolize the POS market in violation of the Clayton and Sherman antitrust acts. The State Attorneys General contended that "defendants have obtained dominant control of the manner, pace and circumstances for introduction of a national EFT-POS system.... This dominant control also suppresses competition because potential entrants into the national EFT-POS market confront what is essentially a joint venture of the two bankcard associations, the two largest shared national ATM networks ... and potentially all of the major banks in the United States."^a

The allegation that the Entree plan deterred entry into the POS market is supported by studies of network industry competition. Researchers have shown that a product preannouncement in an industry with strong network externalities, such as Entree, can deter entry by preventing an alternative network from gaining a large enough base of members to make it an attractive alternative.^b Such an announcement can work in this way if it succeeds in convincing enough participants to delay joining any network other than the preannounced one. In other words, if enough participants anticipate the bandwagon effect in the preannounced product, they can reduce the possible bandwagon for competing products.

The suit sought a divestiture of Plus and Cirrus, as well as prohibitions on Visa and MasterCard from jointly operating Entree or any other POS system. In an out-of-court settlement in May 1990, Visa and MasterCard agreed not to develop Entree. However, they admitted no wrongdoing and were not required to divest themselves of Plus and Cirrus.

^a"The States of New York, Arizona, California, Connecticut, Louisiana, Maryland, Massachusetts, Minnesota, Tennessee, Texas, Utah, Washington, West Virginia, and Wisconsin against Visa U.S.A., Inc., and MasterCard International, Inc.," First Amended Complaint, CV-89-5043 (PNL), United States District Court, Southern District of New York.

^bSee Joseph Farrell and Garth Saloner, "Installed Base and Compatibility: Innovation, Product Preannouncements, and Predation," *American Economic Review* 76 (1986).

Large networks, however, pose risks of anticompetitive practices, such as discriminatory membership rules and monopolistic pricing. Federal antitrust laws and the mandatory-sharing laws in many states are designed to

prevent these practices. So far, however, spirited competition continues between the national systems and the regionals (due to the regionals' reciprocal sharing agreements) and among regional networks.