Community Bank Access to Payment Card Networks:

Has It Become More Expensive?

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Abstract

The payment industry is undergoing significant change. Consolidations among payment networks and processors have been seen in every payment service area and technological advances provide incentives for even larger financial institutions to outsource their transaction processing. As a result, a smaller number of networks or processors are competing more vigorously for larger financial institutions. In doing so, volume-based pricing or volume discounts are commonly practiced in the industry. This paper examines whether the change in fee structure of networks and processors make community banks' access to the payment card networks more expensive. Although community banks pay relatively higher fees per transaction to the networks than their larger counterparts, their fees per transaction have not increased for most of the payment services. Processing fees that community banks pay to their processors have likely decreased. In addition, new processing arrangements have evolved so that community banks can take advantage of the change in processors fee structure.

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1. Introduction

The payment system in the United States has been changing rapidly. Steady growth of electronic forms of payment has been seen in the last decade, with more expected in the future. Paper-based payments, on the other hand, are predicted to continue declining. The payment card industry is in the midst of such changes.[2]

One of the most noticeable changes in the payment card industry is the heavy consolidation among ATM and online debit networks. Although the overall number of networks has declined and the resulting smaller number of networks have gained larger market shares, most of the payment markets are still competitive. Networks are competing more vigorously for larger financial institutions that send larger transaction volume to them. In doing so, volume-based pricing or volume discounts are now commonly used in the industry.

Advances in technology make transaction processing more sophisticated. Outsourcing transaction processing is indispensable for smaller financial institutions when they access the payment networks. Even larger financial institutions benefit from outsourcing some of their activities to third-party service providers. Consolidation has been progressing among the processors, and nonbank processors have become prominent in every type of processing business.[3] In most of the processing markets, both larger processors and smaller processors coexist. Larger processors tend to compete for larger financial institutions and smaller processors tend to serve the smaller financial institutions. Despite the market segmentation, almost all processors are practicing volume-based pricing, preferred pricing, and/or group pricing.

This paper examines how changes in the industry, such as changes in fee structure and outsourcing transaction processing, have affected community banks' access to the payment card

[2] See Hayashi, Sullivan, and Weiner (2003) for the changes in the ATM and debit card industry.

networks. More specifically, it examines whether community bank access to the payment card networks has become more expensive.[4] This paper takes an approach of defining community banks solely in terms of their size.[5] In this paper, a community bank is defined as a bank owned by an organization with less than $500 million in total assets. Community bank access to the payment networks is important from a policy perspective because it directly influences the access by end-users, such as consumers and businesses, who have bank accounts with community banks. Providing payment services is one of the most important businesses for financial institutions, not only because it generates revenues but also because it is necessary in keeping customer bases.[6] If access to the payment networks becomes too expensive for community banks to provide their customers such payment services, some of the customers may move their accounts to other financial institutions.

Because of a lack of detailed pricing information, this study cannot do rigorous quantitative analysis. This paper, however, can make the following observations. Although community banks pay relatively higher fees per transaction to the payment card networks than their larger counterparts, for most of the payment services the actual fees per transaction that community banks pay to the networks have not increased. Since most of the community banks are outsourcing their transaction processing, they need to pay service fees to their processors. Because of the processors' fee structure, financial institutions with smaller transaction volume need to pay relatively higher prices than financial institutions with larger volume; nevertheless, processing fees seem to have declined for all sizes of financial institutions. In addition, outsourcing gives more flexibility to community banks and even new processing arrangements

[3] See Bradford, Davies, and Weiner (2002).
[4] This question is addressed in earlier work by Hayashi, Sullivan, and Weiner (2003).
[5] The same approach is taken by other studies. See, for example, Kahn, Schroeder, and Weiner (2003).
[6] See Redecki (1999) and Rice and Stanton (2003).

have evolved. Community banks collectively act and try to accumulate their volume as much as possible so that they can receive lower prices from processors. Organizations, such as bankers' banks and ICBA Bancard, a subsidiary of the Independent Community Bankers of America (ICBA), help such efforts on the part of community banks by providing payment card programs.

The rest of the paper is organized as follows: Section 2 details statistics on the usage of payment card networks and processors by community banks. Community banks' costs and activities that are necessary to provide payment services to their customers are described in section 3, and the question of whether community banks' access has become more expensive is examined in section 4. Section 5 provides a conclusion.

2. Connection to the ATM and Online Debit Networks—ICBA 1999 Survey

Statistics on bank connections to payment card networks, such as ATM, debit card, and credit card networks, are hard to obtain. However, a general idea of what percentage of the community banks use national and regional ATM networks, online debit networks, and processors can be obtained from a recent ICBA survey of community banks on ATM/EFT network usage.

The ICBA conducted a survey of community banks on ATM/EFT network and processor use in 1999. The association distributed a total of 5,586 surveys nationwide and received 877 completed surveys.[7] The results shown below, however, eliminated 40 observations due to incomplete information on ATM network and processor usage, and 4 observations due to lack of asset information. Compared with the 1999 third quarter Consolidated Reports of Condition and Income (Call Reports), the distribution of the ICBA survey respondents was relatively concentrated in the groups whose total assets ranged from $25 million to $100 million (See Chart 1).

Chart 1: Distribution of Survey Respondents and Call Reports by Asset Size

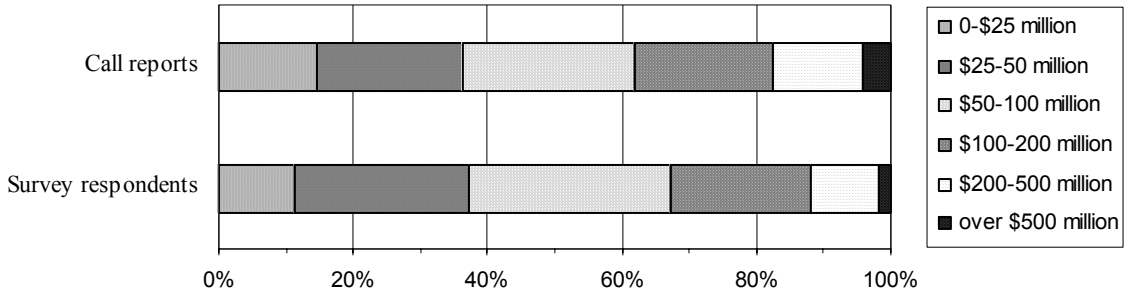

Table 1 shows the membership of national and regional ATM networks, and regional online debit networks by bank asset size. The number represents the percentage of banks that joined at least one national ATM network (the first column), that joined at least one regional ATM network (the second column), and that joined at least one regional online debit network (the third column), respectively. Several interesting observations can be pointed out from this table.

First, banks are more likely to join national ATM networks than regional ATM networks. While about 92 percent of the respondents were members of at least one of the two major national ATM networks, which are Cirrus and Plus, about 74 percent of the respondents were members of at least one regional ATM network. This tendency is true for all asset size groups.

Second, there is a difference between the percentage of regional ATM network membership and that of regional online debit network membership. More banks joined ATM networks than online debit networks, although the largest and the second largest asset-size group have the same percentage for ATM and online debit network membership. The difference results from the fact that some regional EFT networks provide both ATM and online debit transactions at the point of sale and others provide just ATM transactions. Smaller banks are more likely to

[7] The survey respondents included not only commercial banks but also saving and loan banks.

join networks that provide only ATM transaction switching, while larger banks are more likely to join networks that provide both ATM and POS transaction switching.

Third, while the percentage for the national ATM network membership does not vary according to the asset size of the bank, the percentage for the regional ATM/debit card network membership varies according to the bank asset size: 91 percent of the banks in the lowest asset-size group (total assets are less than $25 million) and 87 percent of the banks in the highest asset-size group (total assets are $500 million or more) were members of either Cirrus or Plus. On the other hand, the greater the bank asset size, the more likely the bank will join regional networks. Only one out of two banks in the smallest asset-size group were members of any regional networks, while more than nine out of 10 banks in the largest or the second largest asset-size group were members of the regional networks.

Table 1: Percentage of the ATM/Online Debit Network Membership

(%)

		National ATM Networks	Regional ATM Networks	Regional Online Debit Networks
Total		92.4	73.7	69.4
Asset size	$0-$25 million	91.1	53.3	51.1
	$25-$50 million	92.2	71.4	65.0
	$50-$100 million	89.7	74.6	68.3
	$100-$200 million	96.0	74.3	72.0
	$200-$500 million	96.4	94.0	94.0
	>=$500 million	86.7	93.3	93.3

Table 2: Detailed ATM Network Membership

(%)

	Combination of national and regional networks	1N & 0R	0N&1R	2N&0R	1N &1R	0N&2R	At most 2
Total		18.4	7.2	7.9	43.1	0.4	77.0
Asset size	$0-$25 million	36.7	8.9	10.0	28.9	0.0	84.4
	$25-$50 million	18.9	7.4	9.7	47.5	0.5	83.9
	$50-$100 million	19.0	9.9	6.3	41.7	0.4	77.4
	$100-$200 million	16.0	4.0	9.7	44.0	0.0	73.7
	$200-$500 million	3.6	3.6	2.4	50.0	0.0	59.5
	>=$500 million	0.0	6.7	6.7	40.0	6.7	60.0

Note: 1N & 0R implies the banks join one national network and zero regional network and 0N & 1R implies the banks join zero national and one regional network, and so on.

Table 2 presents more detailed statistics on the national and regional ATM network membership by bank asset size. We observe that the smaller banks tend to join fewer networks. For example, 46 percent of the smallest asset-size group joined one network only, 37 of that 46 percent went to a national network only, and 9 percent went to a regional network. In contrast to the smallest banks, only 7 percent of the banks in the largest and second largest asset groups joined one network only. Except for the banks that were categorized as the smallest asset-size group, banks typically joined two networks: one national and one regional network.

Tables 1 and 2 suggest that bank asset size may determine the number of networks the banks will join. If a bank's asset size is not big enough to join more than one network, the bank is likely to join a national network. If a bank's asset size is big enough to join two networks, the bank tends to join one national and one regional network. There are several possible reasons why small banks are more likely to choose a national network over a regional network.

First, the coverage of a national network is broader than that of any regional networks. About 70 to 90 percent of ATMs in the United States were connected to at least one of the two national networks in 1999. This allows a small bank to issue ATM cards that can initiate transactions at almost any of the ATMs in the country. This also allows the bank to acquire almost any transactions initiated by other banks' cardholders at its ATMs. In this way, the bank connecting to one national network can provide its cardholders universal ATM access and can have an income stream as an acquirer of ATM transactions.

Second, the national network membership is sponsored by organizations, such as ICBA Bancard and bankers' banks, while the regional network membership is not usually sponsored by those organizations. This enables small banks to have relatively inexpensive access to national networks.

Third, one of the most important recent developments is that most processors provide gateway services; this allows financial institutions to directly connect to networks they want. It used to be difficult for banks to connect to a national network directly because connections to national networks had been through regional networks.

Statistics on the bank usage of processors are presented in Table 3. The first column shows the percentage of banks that process the transactions by themselves (In-house processing). Only 10 percent of the survey respondents processed transactions in-house; this implies the other 90 percent have outsourced transaction processing to third-party service providers. Although a relatively higher percentage of banks with larger assets processed transactions in-house, the overall percentage of banks that processed transactions in-house is small. In-house processing would be more costly than outsourcing, especially for smaller banks.

The second column shows the percentage of the banks that used the same organization as their processor and network. About one-fourth of the survey respondents used the same organization for transaction processing and for network switching. Some networks had a processing company (e.g., Shazam and ITS), and some processors started owning networks from the late 1990s. (e.g., MAC, NYCE, and Exchange). The percentage of banks that use the same processor and network today may be even bigger. There may be some advantages for financial institutions to use the same organization, such as simplified fee statement, same help desk services, and possibly pricing, even though financial institutions typically make separate contracts with the organization's processing and network switching business.

The last column shows the percentage of banks that used the major processors (ranked in the top 10 as of 1999). This statistic may imply that smaller banks tend to use smaller processors or that smaller processors specialize in smaller banks.

Table 3: Bank Usage of Processors

(%)

		In-house	Regional Network =Processor	Major Processors
Total		10.1	25.8	61.9
Asset size	$0-$25 million	6.4	16.0	48.9
	$25-$50 million	10.3	27.7	59.6
	$50-$100 million	10.7	25.8	62.3
	$100-$200 million	8.2	23.4	64.3
	$200-$500 million	14.1	35.3	74.1
	>=$500 million	20.0	33.3	73.3

Although there are no definitive statistics available yet, more and more community banks appear to be using services from organizations, such as ICBA Bancard and bankers' banks, to provide their customers credit card, debit card, and ATM card services. For example, the number of ICBA Bancard's bank clients has increased in the last several years: It experienced double-digit annual growth rates in terms of the number of bank clients in debit card and ATM/EFT processing services. For merchant acquiring services, on the other hand, the number of community banks that use services from ICBA Bancard and bankers' banks seems to have declined.

3. Community Banks' Costs and Activities to Access Payment Card Networks

Before considering whether community banks' access to payment card networks has become more expensive, one needs to know necessary costs and activities that community banks must engage in to provide card payment services to their customers. There are two types of activities that banks have to be involved in: one is as card issuers and the other is as merchant acquirers. Financial institutions provide payment cards to their retail customers so that the customers can use cards as payment instruments. They also provide services to their commercial customers so that the customers can accept the card transactions. Below describes costs and activities as card issuers and as merchant acquirers, respectively. Since ATM/debit card issuers' activities and

credit card issuers' are slightly different, we will discuss ATM/debit card issuer first and then credit card issuer.

3.1 As a card issuer

ATM/Debit card

In order for financial institutions to provide their retail customers ATM/debit card payment services, the financial institutions should first establish access to the networks and then engage in ongoing transaction processing.

To establish access to regional networks, financial institutions need to become members of those networks. To access national ATM/online debit networks, the financial institution should either become a member or be sponsored by an organization. Sponsors are bankers' banks, bank associations, such as ICBA Bancard and state-level bank associations, and some regional networks. Only bankcard association members can issue offline debit cards. Since no networks have discretionary rules, any financial institutions can join whichever networks they want.[8] When community banks decide which networks to join, there are various factors they take into consideration. Network fees that banks should pay and receive (as card issuers or ATM owners) are one of the key determinants.

Network fees vary by network. Many of the ATM/debit card networks charge an initiation fee or a one-time access setup fee, which is charged at the time when a financial institution joins the network. A flat initiation fee is the norm for regional networks, but some networks charge the fee based on the bank's asset size. Initiation fees of national ATM/online networks vary depending on how the bank issues the cards. If a bank issues national ATM or online debit network cards through sponsorship, it pays a flat initiation fee. If, instead, a bank

[8] Some networks specialize their services to credit unions.

issues those cards as a bankcard member, it pays a fee based on the bank's asset size when it joins the bankcard association. Since only bankcard association members can issue offline debit cards, the initiation fee is paid when banks join the association.

Networks charge ongoing periodic fees, such as monthly or annual fees. The fee structure of offline debit card networks is quite similar to that of credit card networks: Fees depend on the number of cards issued and the volume and value of transactions. The national ATM/online debit networks' periodic fees are basically card fees: Members pay an annual fee on every card that they issue. The regional networks' monthly/annual fees vary greatly by network. Some networks do not charge any monthly/annual fees, some charge a flat fee, and some charge a fee based on the asset size and/or the number of cards the bank issues.

There are two kinds of fees that network members need to pay per transaction: switch fees and interchange fees. Switch fees are paid by financial institutions to the network for the use of its switch. Interchange fees are set by the network but they are paid either to card issuers (for POS debit transactions) or to transaction acquirers (for ATM transactions).

Although there is some variation, ATM switch fees are usually paid by card issuers only and POS debit switch fees are paid by both card issuers and merchant acquirers.[9] While some ATM networks charge flat switch fees, other ATM networks use a tiered structure, based on volume. That is, the ATM switch fee is lower for financial institutions that send a large volume of ATM transactions to the network. In 2003, the highest ATM switch fee in a network is two to four times as high as the lowest ATM switch fee in the same network.[10] Compared with switch fees for ATM transactions, volume-based switch fees are less common for debit transactions at the point of sale.

[9] See Hayashi, Sullivan, and Weiner (2003) p. 52.
[10] *EFT Data Book* (2003).

For ATM transactions where card issuers pay interchange fees to ATM owners, flat interchange fees are commonly practiced, but some networks use volume-based interchange fees. For POS transactions where merchant acquirers pay fees to card issuers, a two-tier fee structure with a cap is becoming popular. The first tier is a flat fee and the second tier is a certain percentage of the transaction value. Some of the networks that adopted two-tier interchange fees also adopted volume discounts to the merchants (not merchant acquirers) that send large transaction volume or value to the network. Card issuers, however, receive the same interchange revenue regardless of whether the transaction occurs at a merchant who receives discounts.

Once financial institutions establish access to the networks, they need to engage in ongoing daily activities that enable their cardholders to use ATM/debit card products. As ATM/debit card issuers, financial institutions should be involved in activities such as account management, transaction authorization and transaction processing (as an ATM owner), and clearing and settlement. Each of the three activities in turn, along with possible outsourcing arrangements, is described below.

First, ATM/debit card issuers need to do account management. Since a financial institution issues ATM/debit cards to its customers who have demand deposit accounts (DDAs) at the financial institution, the ATM/debit account maintenance, such as updating current balance of accounts, is part of the account maintenance of DDAs. Since DDA maintenance is indispensable, even if the financial institution does not provide ATM/debit card services to its customers, the costs of maintaining accounts due to ATM/debit transactions might be negligible. Risk management also is part of the account management. Although debit card characteristics, such as entering a personal identification number (PIN) and checking against DDAs at the point

of transaction, are effective in preventing the occurrences of fraudulent transactions, risk management against fraud losses is critical for ATM/debit card issuers.

According to a recent survey, two-thirds of community banks do core-data processing in-house.[11] The rest outsource it to third-party service providers or banks that offer correspondent banking services. Financial institutions may outsource risk management of their debit card portfolio or may purchase software for the risk management and do it either in-house or by core-data processors.

The second activity as a card issuer is transaction authorization. When the issuer's cardholder initiates a transaction, the network forwards a transaction authorization request to either the card issuer or its processors. Since typical ATM/debit cards carry multiple network logos, authorization requests are sent from each of these networks. There are three types of arrangements for transaction authorization. The first case is that the card issuer or its core-data processor does all of the processing. The issuer (or its core-data processor) maintains the connection with each of the networks and authorizes transactions. The second case is that the issuer does not maintain the connection but uses gateway services provided by processors. The processor receives authorization requests from each of the networks to which the issuer belongs and forwards them to the issuer or its core-data processor. The issuer decides whether to authorize the transaction. The third case is that the processor provides transaction authorization: each transaction authorization request does not come to the issuer or its core-data processor. The processor has a copy of the card issuer's DDA information and decides authorization based on it. At end of day, the processor transmits the card issuer's cardholder transaction information to the issuer. After receiving the information, the issuer or its core-data processor updates DDAs, posts

[11] 2003 Community Bank Technology Survey conducted by ICBA and InFinet Resources.

debits to cardholders' accounts according to it, and sends a copy of updated DDAs. The next day, the processor decides authorization based on the updated DDAs.

Community banks typically use the second or third arrangement. Smaller banks may choose the third arrangement because the second arrangement requires that telecommunication be connected at all times, and the third arrangement does not. By opting for batch processing, cardholder's transactions cannot be checked against the current account balance. This may increase the issuer's credit risk, but the issuer can save telecommunication costs. Larger banks, on the other hand, may prefer the first arrangement because large card issuers are usually larger ATM owners. ATM owners may prefer to have a control on their transaction routes since some processors have priority routing to particular networks.

Most ATM card issuers deploy ATMs so their cardholders can access their DDAs via ATMs. An ATM owner (or its processor) needs to process transactions occurring at its ATMs. To do so, the ATM owner or its processor should drive terminals and route transactions to the appropriate networks.[12] Since most ATMs accept many different networks' transactions, terminals should be connected with these networks either directly, through its ATM owner's host computer, or through its processor. Basically, there are two types of outsourcing arrangements. The first is that the ATM owner drives the terminals and its processor provides gateways to route transactions to the networks. The second type is that the ATM owner uses a service provider that drives terminals and either the terminal driver or a processor other than the terminal driver routes transactions. The latter arrangement is common if financial institutions use ATM independent sales organization (ISO) services. Typically, an ATM ISO drives ATMs and contracts a third-party processor for transaction routing. Most large processors offer both terminal driving and transaction routing services, but financial institutions may use either one of the two services or

both from the same processor. Smaller banks may outsource both terminal driving and transaction routing. Larger banks, however, may process in-house, so that they can control to which networks they will route the transactions.

Lastly, clearing and settlement also are important activities for ATM/debit card issuers. At end of day, an ATM owner or its processor sorts transactions by networks and reports it to each of the networks. Each network calculates its ATM owners' and card issuers' net positions and provides that information to the network's clearing bank. Settlement among network participants (card issuers, ATM owners, or merchant acquirers) occurs either by positing to the accounts at the network's clearing bank or by originating ACH entries to participants. Many processors provide single-point settlement services. The processor provides a settlement point for its customer financial institutions: The processor or its clearing bank receives ACH items initiated by each network's clearing bank. After that, settlement between financial institutions and the processor takes place. In this way, a financial institution does not have to receive an ACH item from each of the networks it joins, but receives just one ACH item from the processor. In addition, many networks adopt processor-level settlement: The network settles with processors instead of settling with each individual member financial institution. All member banks that use the processor then receive ACH from the processor. This arrangement reduces the number of ACH items for settlement of ATM/debit network transactions. Since commercial ACH items charge fees to both the sender and receiver, this helps to save processing costs.

Settlement between issuer and cardholders is not necessary for most of the PIN-based transactions because for those it occurs at the time of transaction. Settlement between issuers and cardholders occurs after the settlement among network participants for signature-based

[12] See Hayashi, Sullivan, and Weiner (2003) p. 9.

transactions and for PIN-based transactions that are processed in a batch mode by positing debits at the cardholders' DDAs.

As the ICBA survey results suggest, most ATM/debit card issuers may outsource all or some of these activities. If card issuers do all of these activities in-house, they would need significant start-up capital investment and ongoing processing costs. Usually, a considerable amount of the costs for card issuers is the fixed costs that do not vary according to the volume of transactions or the number of accounts in the debit card portfolio.[13] Equipment, such as the telecommunication lines that connect the card issuer to the network, computers that store account information and that run software, and software programs that are used for account management, processing, and settlement, is necessary no matter how small the number of accounts or the transaction volume. The size of the staff who manages the operation may grow as the transaction volume increases, but staffing also may exhibit scale economy. By outsourcing, card issuers can save some of the capital investment and ongoing processing costs required for in-house processing. Third-party service providers can take advantage of economies of scale by accumulating the transaction volume of all their customers. Smaller card issuers tend to outsource most of the activities, while larger issuers may do some activities in-house and outsource other activities. They also outsource different activities to different service providers. For example, the same financial institution's core data processing and ATM terminal driving can be done by different service providers.

Besides saving costs, the third-party processor's services give financial institutions more flexibility. The processor's infrastructure typically includes telecommunication connections with most of the networks, which enables financial institutions to choose any network. Traditionally, gateways to national networks are provided by regional networks, and therefore financial

institutions needed to join at least one regional network to connect to a national network. Now, however, gateway services provided by processors allow banks to join national networks without joining any regional networks.

The processor's fee structure is somewhat similar to the network fee structure. They charge a one-time setup fee, ongoing periodic fees, and per transaction fees. Most major processors provide a volume-base fee structure, volume arrangement, or preferred pricing.[14] Although smaller financial institutions can save costs by outsourcing some of their activities, they still need to pay relatively higher prices to processors for the use of their services than their larger counterparts.

To reduce some of these fees that community banks need to pay, organizations, such as bankers' banks, ICBA, and bank associations, provide services to community banks. For example, ICBA Bankcard provides an EFT service program to ATM owners and a debit service program to debit card issuers. ICBA Bancard contracts with two processors for its program participants' processing of EFT transactions. Since all program participants outsource transaction authorization or processing to either one of the two processors, the processors are guaranteed a certain transaction volume. ICBA Bancard receives a group pricing from the processors so that each participant can save costs by paying lower fees to the processor. If each participant contracts with either one of the two processors individually, it has to pay higher fees. Some bankers' banks offer similar programs to ICBA Bancard by contracting with a third-party processor for their members' transaction processing. Other bankers' banks do not have such programs but endorse a third-party processor. If their members choose to use the processor endorsed by the bankers' bank, the processor may give preferred pricing to the members.

[13] See Manfred (2002).

Whether community banks use these services or not may greatly affect their processing costs. According to a report by First Annapolis, for smaller institutions the processing price range (between high and low price points) was over 100 percent.[15] Banks that use the services provided by organizations, such as ICBA Bancard and bankers' banks, may pay lower processing prices than the banks that do not use such services.

Credit card

In order for a financial institution to issue credit cards, it needs to join a bankcard association.[16] There are two ways for community banks to join the network. One is to become a principal member and one is to become an agent bank of a principal member.[17] A principal member is a direct card issuer, which is licensed for each of the card products it issues from the bankcard association. An agent bank, on the other hand, can provide its retail customers' credit cards that bear the bank name and logo in exchange for marketing the sponsoring bank's card program.

Regardless of the membership type, a member needs to pay fees to the bankcard associations. When a financial institution joins the association, it pays an initiation fee to the association. This fee is based on the financial institution's asset size. In addition, a licensed member should pay a flat fee, depending on which products it is licensed for. A member's ongoing periodic fee is based on various factors. The fee depends on the number of cards it issues, the number of bank identification numbers (BINs) it carries, its cardholders' total transaction volume, and its cardholders' total sales value in a certain period of time.[18] There are

[14] The author conducted an e-mail survey of payment card networks and processors on their fee structure. According to the survey, all processors practice volume-base pricing, volume arrangement, or preferred pricing.
[15] The same study showed that the price range for larger institutions is about 70 percent.
[16] Here, we will consider only Visa and MasterCard networks (exclude American Express and Discover).
[17] Larger financial institutions are not qualified as agent banks, since Visa and MasterCard set a maximum transaction volume that a financial institution can be qualified as an agent bank.
[18] If sales value did not meet a certain threshold level, a direct member is assessed a quarterly minimum fee.

no per transaction fees that card issuers pay; rather, they receive interchanges from merchant acquirers, which are passed on to merchants, for their cardholders' transactions.

A card issuer owns a credit card portfolio and has full control over the program by determining its product pricing, fee structure, application approvals, underwriting and collection procedure, and marketing strategies. An agent bank, on the other hand, does not own a credit card portfolio and thus has little control over its sponsor's program. There are several activities that credit card issuers should be involved in. Those activities include account management, transaction authorization, and clearing and settlement. While credit card transaction authorization is quite similar to debit card transaction authorization, the other two activities are slightly different for credit card issuers and for ATM/debit card issuers.

Credit card account management differs from ATM/debit card account management on two points. First, credit card accounts are not tied with DDAs. A financial institution can issue credit cards to those who do not have DDAs at the financial institution. Therefore, an application process is necessary to determine to whom they will issue credit cards. Second, credit card account management is not just updating customer details, such as credit limits, credit balances, addresses, and other vital details. Rather, its importance is in risk management. Since credit cards have a credit function—cardholders can make loans if they do not pay the full amount in the balance—credit losses, due to contractual delinquency and bankruptcy, are significant risks for card issuers.[19] To prevent these losses as much as possible, card issuers screen applications and monitor an entire credit card portfolio. Fraud losses, including unauthorized use of lost or stolen cards, fraudulent applications, and fraudulent use of a cardholder's credit number, also are

[19] In 2002, a sum of Visa and MasterCard's charge-offs were $24.7 billion, which was about 5.2 percent of the total Visa and MasterCard's receivables at 2000 year-end.

significant risks for card issuers.[20] Because of the consumer protection for fraudulent credit card transactions, the credit card issuers or merchants are responsible for any fraud involving credit cards. To minimize fraud, card issuers need to monitor cardholders' transactions. Presently, many card issuers utilize technology or software that measures each cardholder's credit-worthiness and/or predicts the likelihood of fraud at the point of transaction.

Settlement of credit card transactions also is slightly different from settlement of ATM/debit card transactions. Similar to the ATM/debit transactions, settlement among the bankcard association members occurs each day. In contrast with ATM/debit transactions, where settlement between the issuer and cardholders takes place each day, settlement between credit cardholders and card issuers usually occurs once a month. Since cardholders do not necessarily have DDAs at the card issuer, the card issuer needs to send a statement to its cardholders each month. Then cardholders pay bills either by checks or electronically (ACH direct debit or online bill payment). Cardholders do not have to pay the full balance, but they must pay at least the minimum amount due. After receiving the payments, card issuers update the cardholder's account to reflect the payments.

Similar to the ATM/debit card issuer's activities, the activities that credit card issuers need to engage in exhibit economies of scale. Therefore, credit card issuers also reduce the costs by outsourcing all or some of the activities to third-party service providers. Community banks, especially smaller ones, used to be unable to justify the cost of issuing credit cards even though they used third-party provider's services. Therefore, in the past, they typically chose to be an agent bank of a larger card issuer. Today, however, efforts by organizations, such as ICBA Bancard and some bankers' banks, enable community banks to be direct card issuers. The

[20] In 2002, the total fraud losses were $670 million, which is about 0.07 percent of the total Visa and MasterCard transaction value.

organizations not only provide sponsorships to community banks but also contract with third-party service providers as their affiliated partners for their members. They can take advantage of a large aggregated transaction volume or a large number of accounts from the member participants to get fee discounts from the third-party providers. Thus, each member bank can save fee payments to the providers. If the bank contracts with the same third-party providers individually, it would pay higher fees. Other organizations, such as some of the state-level bank associations, endorse third-party providers. Each member bank needs to contract with the endorsed providers individually, but in most cases, it can receive preferred prices from the providers. These efforts allow even smaller banks to become credit card issuers. It is reported that, on average, a bank needs 400 credit card accounts to break even.[21]

Agent bank programs also have changed recently. In a traditional agent bank program, an agent bank assumes no liability on its customer's credit card portfolio and since cardholders' accounts belong to the sponsoring bank, the activities, such as account maintenance, transaction authorization, and settlement are not included in agent banks' activities. Recently, some credit card programs have started offering an opportunity for agent banks to increase their income stream by sharing liability for their cardholders' portfolio with the sponsoring bank.[22] A sponsoring bank and its agent bank share the risks associated with the agent bank customers' credit card portfolio in exchange for sharing the income accrued from the portfolio.

3.2 As a merchant acquirer

In order for a bank to become a merchant acquirer, the bank needs to be a member of the networks: Either a direct card issuer or an agent bank of a direct card issuer can be an acquirer.[23] In some networks, members are assessed additional member dues as merchant acquirers. The fee

[21] "Winning the Card Game" by Laurie Solheim in *Community Banker*, April 2001.
[22] ICBA Bancard and some bankers' banks offer such agent bank credit card programs.

is typically based on the sales volume of their merchants. Acquirers need to pay a POS switch fee to the network for each transaction that occurs at their merchants. Some networks charge a switch fee, the level of which varies based on the volume of transactions that the acquirer sends to the networks. Other networks charge a flat switch fee. Acquirers also have to pay interchange fees to card issuers. In most networks, interchange fees vary according to merchant characteristics and/or transaction characteristics. Credit card networks have been using a two-tiered interchange fee structure: a flat portion plus a percentage of the transaction value. Debit card networks used to charge a flat interchange fee, but recently some of them adopted a two-tiered fee structure. Some of the networks also offer volume discounts to larger merchants (not to merchant acquirers) who send a certain transaction value or more in a certain period of time.

Activities as a merchant acquirer include recruiting and authorizing new merchants to the network, managing a merchant portfolio, processing transactions at their merchants, and providing clearing and settlement services.

Although recruiting merchants is one of the acquirer's activities, in most cases it is outsourced to independent service organizations (ISOs) and/or agent banks of acquirers (if the acquirer has an agent program). In many cases, ISOs not only recruit merchants but also administer merchant services. Agent banks can utilize the relationship with their commercial customers to sign up merchants for their sponsoring banks.

Risk management is an important activity for the acquirer, since a merchant acquirer carries merchant's liability. The most significant risk for acquirers is credit risks due to chargebacks: If the merchant is unable to pay its chargebacks because of bankruptcy or fraud, the acquiring financial institutions must cover the chargebacks and pay the issuing bank. To mitigate such risks, acquirers must carefully manage the merchant portfolio and employ appropriate

[23] As discussed above, typical membership for a regional network is a direct membership.

underwriting, chargeback processing, and fraud monitoring. The acquirer also is responsible for screening potential merchant clients when it is recruiting and authorizing new merchants for card networks.

To process the transaction at merchants, a merchant acquirer or its processor must capture transaction information and transmit the information to appropriate networks. The acquirer or its processor provides its merchants with devices that capture information in the cards and helps drive those devices. Since merchants typically accept many different networks' cards, merchant acquirers need to have physical connections with all of these networks. Usually, telecommunication lines are used for the connection between merchants and the network. Some acquirers do all of the activities necessary for processing transactions in-house. However, most acquirers outsource all or some of the processes to third-party processors.

At end of day, a merchant acquirer or its processor reports all of its merchants' transactions to each of the networks. Then the network calculates its participants' (merchant acquirers and card issuers) net positions and initiates settlement. After settlement among the network members is over, merchant acquirers credit their merchants' accounts.[24] If the acquirer uses agent banks and if the agent banks keep the merchant's accounts, settlement between the acquirer and each agent bank takes place first, and settlement between the agent bank and its merchants occurs thereafter. Similar to processors for card issuers, many merchant acquirers' processors provide single-point settlement services.

As described above, many of the merchant acquirer's activities are outsourced. One of the reasons for outsourcing these activities is because third-party processors can take advantage of economies of scale by accumulating transaction volume. Besides economies of scale, there may be another reason why acquirers outsource most of the activities. It is said that staying in the

acquiring business is getting more difficult for financial institutions because transaction processing requires more sophisticated technologies.[25] Larger nonbank processors have become prominent in the business because they can realize economies of scale in a larger degree and they typically invest in more advanced technologies. In order for nonbank processors to process transactions, however, they need to be sponsored by financial institutions. In many cases, acquiring banks only retain settlement obligations and processors do the rest of the activities. This is the so-called "rent a BIN" arrangement. In some cases, a nonbank processor owns its bank as a subsidiary and the subsidiary bank owes settlement obligations.

In contrast with the fee structure of ATM owners' processors, fixed fees charged by merchant acquirers' processors are not so common. While most major processors charge monthly or annual fees and one-time setup fees for processing ATM transactions, some of them do not charge such fees for processing POS transactions.[26] Some processors use a bundled fee structure for all or some of their customers; however, service fees that are charged for each individual service are the norm in the industry.[27] Merchant acquirers' processors also practice volume discounts or volume purchase agreements.

Although many organizations, such as bankers' banks and ICBA Bancard, provide merchant acquiring services to their members, the services may not help smaller banks or even midsize banks to stay in the merchant acquiring markets. For instance, the number of participants of the merchant service program offered by ICBA Bancard has declined. This does not necessarily imply that merchant acquirers turned to process transactions in-house or that the

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[24] Settlement arrangement varies when the acquirers have agent banks and agent banks hold merchants' accounts.
[25] See Evans and Schmalensee (1999).
[26] According to the author's survey, all of the survey respondents charge annual/monthly fees for ATM transaction processing. However, a couple of processors among them do not charge annual/monthly fees for POS transaction processing.
[27] Some processors use bundled fee structure only for smaller merchant acquirers.

acquirers changed service providers from ICBA Bancard. Rather, this may imply that these banks exited from the merchant acquiring market and became agent banks of larger acquirers. Although larger banks still remain in the market, nonbank processors have increased their share in terms of transaction volume. In 2002, the share of the top 10 merchant acquirers was over 80 percent. Among them, eight acquirers are primarily nonbank organizations.

4. Has Community Banks' Access to Payment Card Networks Become More Expensive?

Finally, this section considers whether community banks' access to payment card networks has become more expensive. One of the important developments in the payment card networks in the past several years may be the prevalence of the switch fee volume discounts. Many of the major payment card networks practice ATM and/or POS switch fee volume discounts, and a few networks do not.[28] The card issuers and/or acquirers that send a larger volume of transactions to the network receive discounted switch prices. Larger financial institutions likely send a large transaction volume to the networks, while smaller financial institutions likely send a small transaction volume.

Since financial institutions' costs for network fee payments are not only limited to switch fees but also include fixed monthly or annual fees, whether smaller financial institutions pay higher per transaction costs than their larger counterparts needs to be considered by taking fixed fees into account. There are several different types of fee structures used for monthly/annual fees. The first type is a flat fixed fee. In this case, it is obvious that the difference of per transaction costs between larger and smaller financial institutions gets even bigger. The second type is that a fixed fee depends on the number of cards the financial institution issues. If the

average number of transactions per card is the same for larger financial institutions and for smaller financial institutions, the fixed fee does not affect the difference of per transaction costs between them. If cardholders of large issuers are relatively more active in using cards than cardholders of small issuers, then the difference of per transaction costs gets larger and vice versa. The third type is that a fixed fee depends on the transaction/sales value. It is likely that the transaction/sales value and the transaction volume are proportional. The difference of switch prices is unlikely affected by the fixed fee. The fourth type is that a fixed fee depends on the financial institutions' total assets. The total assets are not necessarily proportional to the number of transactions the financial institution sends to the network. If the assets-transaction volume ratio is relatively higher for larger financial institutions than for smaller financial institutions, the difference of per transaction costs is narrower than the difference of the switch fee levels.

Table 5: Cost Differences

Assumptions						
	Large Bank			Small Bank		
Total assets	$5 billion			$200 million		
# of ATM cards	50,000			2,000		
# of transactions per month	150,000			6,000		
Switch fee	2 cents			8 cents		
Case 1						
A flat monthly fee	$20	$100	$200	$20	$100	$200
Total monthly fee payment	$3,020	$3,100	$3,200	$500	$580	$680
Per transaction costs (cents)	2.01	2.07	2.13	8.33	9.67	11.33
Case 2, 3, and 4						
Fixed fee portion	$50	$200	$500	$2	$8	$20
Total monthly fee payment	$3,050	$3,200	$3,500	$482	$488	$500
Per transaction costs (cents)	2.03	2.13	2.33	8.03	8.13	8.33

[28] According to the author's survey and *EFT Data Book* (various years).

In what degree the four different fixed fee structures affect the difference of per transaction costs between larger issuers and smaller issuers depends on the switch fee differences and the level of the fixed fee. Table 5 describes the fee difference for two hypothetical banks, Large Bank and Small Bank. Small Bank is assumed to have $200 million dollars in total assets, and to have 2,000 cardholders.[29] Large Bank is assumed to be 25 times as big as Small Bank in both assets and cardholder bases: its total assets are $5 billion and it has 50,000 cardholders. Assume that each cardholder generates three ATM transactions per month, so that Large Bank sends 150,000 transactions and Small Bank sends 6,000 transactions to the network per month.[30] Assume also that Large Bank pays a 2-cent switch fee per transaction and Small Bank pays an 8-cent switch fee per transaction because of the transaction volume differences.[31] Switch fee payments in a month are $3,000 and $480, respectively.

According to the *ATM & Debit News*, ATM/online debit card network's monthly/annual fees range from zero to $416.67 per month. The table shows three different levels of the fixed fee, $20, $100, and $200, in the case that the network uses a flat monthly fee structure. It is not surprising that the fixed fee significantly affects per transaction costs of Small Bank. Even a $20 monthly fee contributes 1/3 cent to the per transaction cost. A $200 monthly fee, which is not uncommon, adds more than 3 cents to the switch fee. In contrast to Small Bank, Large Bank's per transaction cost is barely affected by the fixed fee: A $200 monthly fee differs per transaction cost from its switch fee by 0.13 cents.

The table also shows the case where the fixed fee is proportional to the number of cards, the volume/value of transactions, or bank asset size. Since Large Bank is 25 times as big as

[29] According to the 1999 ICBA Survey, the average number of ATM cards issued by a community bank is about 2,000 and average asset size is $200 million.
[30] The average number of ATM transactions per card a month was 3.1 in 2001 and 2.9 in 2002.

Small Bank in asset size, the number of cards, and the transaction volume/value, Large Bank will pay a fixed fee 25 times as much as Small Bank will pay. A monthly fixed fee of $50 for Large Bank and that of $2 for Small Bank are equivalent to a 1.2-cents card fee, or 12-cents per $1 million in assets annually. In this case, as discussed above, the difference of per transaction costs between Large Bank and Small Bank is the same as the difference of switch fees between them. Fixed costs have little impact on the per transaction costs: It adds 0.03 cent to per transaction costs for either bank.

As the example indicates, both switch fee volume discounts and monthly fee structures differentiate per transaction costs for larger banks and those for smaller banks. However, this does not necessarily imply that a community bank's network fee payment has become more expensive.

Chart 2 shows the trends in the highest-end (top) and lowest-end (bottom) ATM switch fees for selected national and regional networks. In contrast to the lowest-end switch fees, which have declined in all networks shown in the chart, the highest-end switch fees have remained stable. However, no networks have increased the highest-end switch fee level, which is likely paid by smaller financial institutions.

Table 6 presents the change in monthly fixed fees for selected networks. No networks changed their fixed fee between 1995 and 1999, and two networks changed their fixed fees since then. Star increased the highest annual fee level, which is likely paid by the largest financial institutions. NYCE raised monthly fees from zero to $175 for all member financial institutions. Although fixed fees have risen in a couple of networks, one can conclude that generally a community bank's costs of paying network fees have not increased in the last several years.

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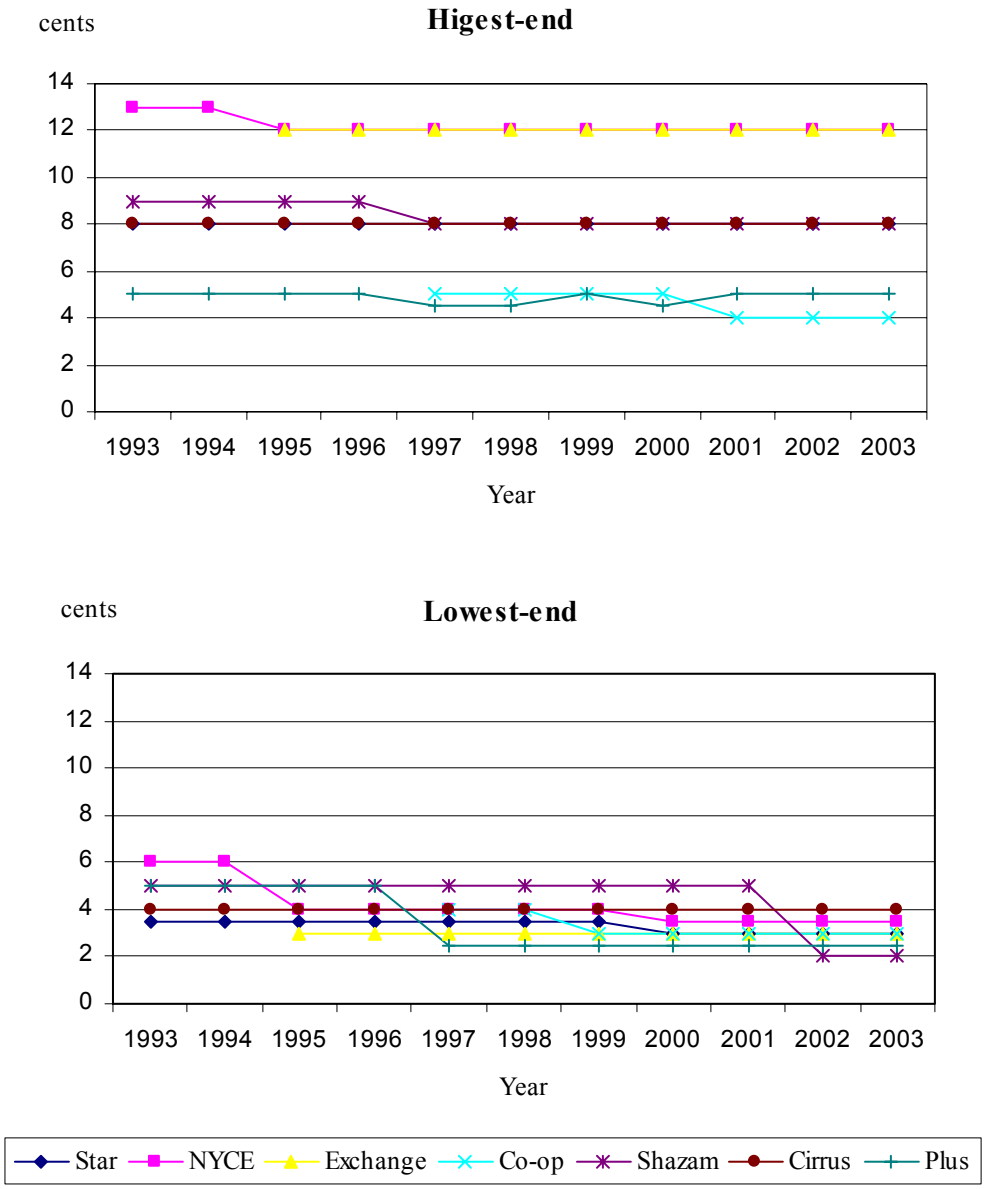
[31] This is a reasonable assumption. According to *ATM & Debit News*, the switch fee range in a network is as low as 1 cent, and as high as 9 cents. In the industry, the minimum ATM switch fee is 2 cents and the maximum is 12 cents.

Chart 2: Trends in ATM Switch Fees—Selected Networks



Sources: *Debit Card Directory*; *EFT Data Book* (various years)

Table 6: Monthly Fixed Fees

	1995	1999	2003
Star	$1,000-$2,250 (a)	$1,000-$2,250 (a)	$1,000-$4,000 (a)
NYCE	$0	$0	$175
Pulse	$0	$0	$0
Exchange	$250	$250	$250
Co-op*	$3,000 (a)	$3,000 (a)	$3,000 (a)
Shazam	$0	$0	$0
Cirrus	$50-$500	$50-$500	$50-$500
Plus	$50-$500	$50-$500	$50-$500

Notes: (a)-annual. * Non-shareholders only.
Sources: *EFT Data Book* (2003, 2000) and *Debit Card Directory* (1996)

Network members also need to pay interchange fees to each other. For ATM transactions, the card issuers pay interchange fees to the ATM owners. Typically, larger card issuers are owners of a larger number of ATMs and smaller card issuers own a smaller number of ATMs. Therefore, it is hard to tell whether smaller banks are net interchange fee payers or not. For POS transactions, on the other hand, the card issuers receive interchange revenue from the merchant acquirers. Since many smaller banks are not merchant acquirers, even if they are agent banks of an acquirer, they are net interchange fee receivers. The higher the POS interchange fee, the more interchange revenues the smaller banks receive. Even larger banks, which are typically larger merchant acquirers, may benefit from higher interchange fees since merchant acquirers usually pass the interchange fees onto their merchants' discount fees.

Recently, many online debit networks have increased their POS interchange rates.[32] The rate hikes may have benefited community banks. As discussed, it is unlikely that community banks' costs of paying fees to networks have increased. Even if the costs have actually risen for some of the community banks, those banks' revenue increase, as a result of the interchange fee hike, may likely offset the increased costs. The interchange rates for offline debit transactions, on the other hand, were reduced in August 2003 as a result of the recent settlement of the Wal-Mart

[32] See Hayashi, Sullivan, and Weiner (2003) p. 55.

"honor-all-cards" lawsuit against Visa and MasterCard. This reduced a bank's interchange revenue from offline debit transactions. Despite the reduction of offline debit interchange rates, they are still relatively higher than most of the online debit interchange rates. Thus, card issuers may still gain higher profits from offline debit than from online debit transactions.

As previously discussed, which processor(s) a community bank chooses greatly influences its access to payment card networks. Financial incentives seem to be an important determinant for financial institutions to choose processors. Similar to networks, most processors practice volume discounts. Therefore, banks with small transaction volume need to pay higher per transaction fees than those with large transaction volume. Processors' fixed fees may also increase community banks per transaction costs. It is reported that fixed fees make up 10 to 30 percent of total processing costs of financial institutions and these fixed fees are a higher percentage for small institutions.[33] Although there are no statistics on processors' fee levels, it has been reported that processors' fees have declined in the last several years.[34] It may be true that processing prices for larger institutions have been decreasing rather dramatically, whether those prices for smaller institutions have been decreasing at the same rate is another question.

The issuer-side processing market seems to have segmented into two parts. Processors, particularly larger processors, are vigorously competing for larger financial institutions' transaction processing. The scale economies that larger processors can enjoy and their vigorous competition for more profitable customers drive down the processing prices for larger financial institutions.[35] For smaller financial institutions, however, one cannot observe such vigorous competition by larger processors. Rather, small- and mid-size processors seem to specialize in smaller financial institutions' transaction processing.

[33] Manfred (2002).
[34] See for example *ATM & Debit News* (July 25, 2002).

Processors that some bankers' banks and ICBA Bancard contract with are categorized as small- to mid-size processors in their shares in terms of transaction volume. Those processors benefit from such contracts even if they need to discount prices since the processors are guaranteed a certain volume of transactions that may be necessary to realize economies of scale. Bankers' banks and ICBA Bancard may choose those processors rather than large processors, not only because their members can receive services that specifically meet the needs of small financial institutions from those smaller processors, but also because they are likely to take advantage of their purchasing powers over those smaller processors than over larger processors. These days, smaller financial institutions may have more options for processing their transactions. Even if it is the case that smaller processors' pricing has not declined, smaller financial institutions may receive lower prices by using their services through the programs offered by bankers' banks, ICBA Bancard, and other bank associations.

The discussion above, however, may not be applicable to the acquiring-side processing market. Even though organizations, such as ICBA Bancard and bankers' banks, provide merchant acquiring services to their member financial institutions, few of them use such programs. There are several potential reasons why smaller banks do not participate in or have even exited from the merchant acquiring business. As discussed earlier, technological advances may make some financial institutions steer away from being merchant acquirers. Another possible reason would be that both smaller banks and smaller processors may have fallen into the following cycle. Because only few financial institutions use services from smaller processors, those processors cannot accumulate enough transaction volume to realize economies of scale, which may make their fees per transaction higher. Because the processors' fees are high, many financial institutions may not be able to justify staying in the merchant acquiring business.

[35] See DeGraba (2003).

In summary, it is unlikely that costs per transaction that a community bank needs to pay as a card issuer have increased, while it is inconclusive whether the costs per transaction that a community bank needs to pay as a merchant acquirer have become more expensive.

5. Conclusion

The payment industry is undergoing significant change. Consolidations have been seen in every payment service area. Technological advances provide incentives for even larger financial institutions to outsource some of their activities to third-party processors. As a result, a smaller number of networks or processors are competing more vigorously for larger customers. In doing so, volume-based pricing or volume discounts are commonly practiced in the industry.

These fee structure changes likely have affected community banks costs of accessing payment services. Although community banks pay relatively higher fees per transaction to the payment card networks than their larger counterparts, the actual fee levels likely have not increased. At least as card issuers, even when the fees to networks have increased, community banks' processing fees, which are paid to processors for the use of their services, likely have declined. Thus, any increase in a community bank's overall costs of accessing payment card networks likely has been limited.

Furthermore, new processing arrangements that help community banks reduce their fees to processors have evolved. Payment card networks typically charge fees by contract bases. Since each financial institution contracts with the network individually, it may be hard for community banks to send transaction volume large enough to receive volume discounts from the networks. However, community banks can receive volume discounts or group pricing from processors by using programs offered by organizations, such as bankers' banks and ICBA

Bancard. These organizations make a contract with processors so that their program participants can receive prices based on the total volume accumulated by all participants.

So far, community banks have been finding ways to take advantage of the changes in fee structures of networks and processors in most of the payment service areas. In some payment service areas, however, community banks have fewer and fewer roles to play. The lessening of participation in the merchant acquiring business would be one such example. Further research is required to investigate why community banks do not participate in or have exited from the merchant acquiring market.

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