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THE IMPACT OF REGULATION ON THE TECHNOLOGY OF FINANCIAL INSTITUTIONS IN THE UNITED STATES AND CANADA

Christopher M. Tozzo

It is far easier for a Greek to cash a personal euro-cheque in Spain than it is for a New Yorker to cash a check in California.

Dimitri Vittas

Introduction

In her novella *Anthem*, Ayn Rand posits a primitive society that is the last remnant of a global war. The hero of the story rediscovers the electric light while exploring the ruins of the past. He brings his discovery to the community's leadership so society may benefit from his discovery. He is arrested for his actions, because knowledge of electric light would cost the candlestick makers their jobs.

The technological progress vs. employment argument is among the oldest in economics. Technological development is often feared and heavily regulated in the United States. From Henry Ford to Federal Express, innovation, advancement, and improvement have been fought by those who are comfortable with the status quo. Government regulatory agencies are historically part of this group.

The American banking industry has not been immune from this recurring theme. Despite massive government deregulation, culminating in the Depository Institutions Deregulation and Monetary Control Act of 1980, technological advance in the banking industry was slowed and diverted by the Federal Reserve Board's Regulation E and other laws. Regulation E does not ban anything; it just specifies, in excruciating detail, how financial technology is to be implemented. It covers banks' use of automated teller machines (ATMs), electronic funds transfer (EFT), and point-of-sale transactions (POS).

Has such regulation had a favorable or detrimental effect on the banks' ability to take advantage of technology? Have the regulations stifled the ability of banks to offer new and improved services to their customers, or have they prevented banks from engaging in an orgy of advancement as new inventions appear in rapid succession?

The intent of this paper is to compare the application of technological innovation in the
American and Canadian banking industries from a regulatory point of view. Such a comparison provides insight into determining whether strict regulation has helped or hurt the American consumer in terms of cost as well as range and quality of services. Canada, with its widespread application of self-regulation (Doyle, p. 2), provides an opportunity to evaluate the effects of regulation in the United States. Although the amount of Canadian government regulation has been increasing over the past few years, the degree of regulation of the Canadian banking industry has been and remains lower than that in the U.S. This has resulted in an industry which, despite its oligopolistic structure (there are thirteen Canadian-owned banks, as opposed to over fourteen thousand American-owned banks), engages in some of the fiercest competition in any economy (Bradford, p. 60).

**Setting the Stage**

Before proceeding to compare the effects of technology on the American and Canadian banking industries, it is first necessary to compare the industries themselves. The American banking industry consists of four different types of institutions: commercial banks, mutual savings banks, savings & loan associations, and credit unions. There are over 33,000 such institutions, with combined assets of over three trillion dollars (Census, p. 492). Although differences exist between the four types of financial institutions, they are alike in that each accepts demand deposits (e.g., checking accounts) and makes loans of one form or another, and they may therefore be combined for the purposes of this study. Because of varying size among banks, as well as different state branching laws, the number of branches each bank has varies widely, from Bank of America's 1069 branches to Texas' one-branch banks.

The Canadian banking industry is distinctly different from the American in two ways. First, unlike the almost purely competitive structure of the American banking industry, its Canadian counterpart is clearly oligopolistic. We disregard "Schedule 'B' banks" (approximately 60 foreign banks with offices in Canada) because of their minor role in Canadian banking ($12 billion, or 2% of total industry assets). There are thirteen Canadian-chartered (Schedule 'A') banks. Of these thirteen, five (Royal Bank, Canadian Imperial Bank, Bank of Montreal, Bank of Nova Scotia, and Toronto-Dominion Bank) far outdistance the other eight in asset size. Like the U.S., however, Canada has a number of "near banks," or institutions that perform some bank functions. These include trust & mortgage companies, credit unions and *caisses populaires* (credit unions in Quebec), and savings banks. In all, the Canadian banking industry has assets of about $600 billion.

The second way that the Canadian banking industry differs from that of the U.S. is that Canada has a national check-clearing system. Since all Canadian banks operate throughout the provinces, a check need only travel to the nearest regional settling point before the depositor's account is credited. In the U.S., a check must travel to the drawn-upon bank (usually via one or two Federal Reserve banks) before the depositor's account is credited. The superiority of the Canadian system is clear: a Canadian who deposits a check can almost always draw upon it within twenty-four hours; an American may have to wait as long as four days.

**Applications of Financial Institution Technology**

**Automated Teller Machines**

Automated teller machines (ATMs) are specialized computer terminals connected by telephone lines to the bank's central deposits computer. ATMs allow account holders to perform the four basic banking transactions (withdrawal, transfer, deposit, and payment to loan, mortgage, credit card, etc.). The account holder may access the terminal in one of two ways: either through a specialized card issued by the bank, such as a Cirrus card, or through a standard Visa or Mastercard credit card issued by the bank.

The first ATMs appeared in the United States in the early 1970s. By today's standards,
these first machines were primitive. They only allowed cash withdrawals, were off-line, and were limited to the bank which operated it. These “neanderthal ATMs,” though simplistic, served their purpose well. The first ATMs were installed by major banks at their central locations in order to reduce queue time during peak traffic and to extend banking hours. A limited number of ATMs were placed off-premises in only the most advantageous locations.

During the past decade, ATMs have grown in number, sophistication, and breadth of service. The first major improvement was the development of on-line terminals, eliminating the need for daily manual update of the ATM's record of deposits and withdrawals. By this time consumer acceptance of ATMs had grown, and so did consumer demand for ATM services. However, because of the high cost for purchase and maintenance of ATMs (an ATM currently costs around $20,000), even the largest banks found it difficult to significantly expand their private ATM systems. This led to the creation of shared ATM systems.

There are four ways that ATM systems may be shared. First, a multibank holding company may provide an ATM network for its member banks. Second, a bank may sell the use of its ATM network to its correspondent banks. Third (and most popular), similar institutions may unite to create a network, such as the NYCE system of twenty-one New York City banks. Finally, different types of financial institutions (for example, commercial banks and credit unions) may unite to form their own network. The development of shared ATM systems has led to the installation of over ten thousand ATMs in the U.S. Today, ATMs are not a luxury of large banks; they are a necessary service for the bank to remain competitive.

**Electronic Funds Transfer**

Electronic funds transfer (EFT) systems are those that allow either banks or customers the ability to execute transactions without the use of cash, checks, or written documentation. It can be argued that ATM systems are an application of EFT, but since most ATM transactions involve the withdrawal or deposit of cash or checks, ATMs should not be included in EFT discussions.

The major components of EFT are home banking, telephone bill payment systems, and automated clearing houses. With the advent of the microcomputer revolution, banks have begun to offer customers the ultimate ATM location: their own homes. An individual with a microcomputer, the proper software, and a participating bank can now perform the basic ATM transactions from his home. Home banking has much to offer both customers and the participating banks. For the customer, home banking means the elimination of travel and waiting, better cash management, and more timely payments through the elimination of post office delays. For the banks, home banking offers the reduction of paperwork and handling costs, improved float management, and, ironically, fewer ATMs (as well as tellers and support staff).

Despite the potential revolutionary impact of home banking, it does not pose any significant legal questions, nor has there been any significant regulation of it. Therefore, home banking will not be treated at great length in this paper.

A close cousin of home banking is the telephone bill payment system. Through these systems, a customer calls the financial institution's bill payment telephone number, is connected with the computer, and authorizes bill payment through the touch-tone signals. No significant regulations regarding telephone bill payment systems exist; and, since there are few or no services which these systems can provide that home banking cannot, it is likely that telephone bill payment systems will never become a major component of financial institution technology.

The one facet of EFT that has fallen under federal and state regulation is the automated clearing house (ACH). ACHs accommodate pre-authorized deposits and payments without the use of paper checks. Common applications include batch payments by businesses for such things as payroll, dividends, and pensions, and payment of government direct deposits such as Social Security, military payroll, and revenue sharing payments. ACHs are private organiza-
tions working in cooperation with the Federal Reserve (all ACH facilities are housed in Federal Reserve banks, except the New York ACH) (Goldberg, p. 721). As of 1985, there were 38 operating ACHs; all were regional.

ACHs are a benefit to banks through the elimination of large quantities of regularly occurring checks. However, studies indicate that check volume has continued to grow despite ACHs, from 29 billion checks written in 1977 to 40 billion written in 1980 (Rose, p. 20). The one technological advance which theoretically could eliminate most check-writing is the point-of-sale transaction terminal.

Point-of-Sale

Under a point-of-sale (POS) system, whenever a customer purchases a good or service, he pays by simply presenting a POS card (or "debit card"). The card is run through a POS terminal, which is on-line to either the financial institution directly or to a central facility of which the bank is a participant. The cost of the good or service is then immediately transferred from the customer's account to the merchant's. The first full-service POS system was set up in the U.S. in 1974.

EFT experts claim that POS is currently cost-effective in such businesses as gas stations, convenience stores, supermarkets and large retail chain stores (Hogers, p.97). Transactions that do not require clerks or cashiers, such as hotel check in and check out, self-service airline ticket dispensers and lottery ticket machines, could also benefit from POS. The only significant benefits to banks are reductions in paperwork and float; but these, experts say, are enough to motivate banks to participate in POS systems (Hogers, p. 97). The benefit of POS to customers is significant but difficult to quantify. Customers will certainly spend less time waiting in lines, and the need for pocket cash (what economists call the transaction demand for money) will decrease. In fact, in most existing POS systems already set up, it is cash transactions, not checks, that POS has replaced (Hogers, p. 99).

Although POS clearly has advantages to offer all involved, it is the opinion of some that the claims that POS will totally eliminate the need for both cash and checks are unwarranted. There are at least five reasons why POS will not become all-encompassing: the underground economy (cash-based); the mail-order economy (check-based); the account holder's demand for float (eliminated by POS); the desire for command over an account, including the ability to stop payment (the transaction is instantaneous; there is no time lag in which to stop the process); and finally the cost ineffectiveness of POS if used throughout the economy (POS in Sears is likely, but POS for the paperboy?). The impact of regulation on POS will be treated in this paper, but POS must first be placed in its proper context.

Regulation—The American Alternative

It is ironic that the greatest benefit that the new technology has to offer financial institutions, the reduction of paperwork, is exactly what regulation of the technology has destroyed. The sweeping law covering the technology, the Federal Reserve Board's Regulation E of 1980, deals primarily with what paper records banks must generate, for the safety of account holders. The paperwork requirements of Regulation E are so overwhelming that Congress initially requested the Fed to perform a cost-benefit analysis to determine whether Regulation E was too demanding on smaller financial institutions (Brandel, p. 1221).

Regulation E

The Electronic Fund Transfer Act of 1978 authorized the Federal Reserve Board to issue its own regulations regarding EFT use. The Board used this authorization in 1980 by issuing Regulation E.

Regulation E covers all electronic funds transfers. However, it is not always clear what transactions are "electronic." For example, if an account holder writes a check to meet his mortgage payment and delivers the check to an ATM rather than a bank teller, then officially the transaction is initiated by a check and is not an "electronic funds transfer," despite the fact that the payment is handled electronically. On the other hand, an account holder who deposits his paycheck in an ATM has initiated
his deposit electronically; the deposit is therefore an "electronic funds transfer": the fact that a check is being deposited is irrelevant. This fine line is often difficult to understand and apply; but in general, most ATM, ACH, and POS transactions are considered "electronic" and fall under Regulation E's restrictions. The exemption of "paper-initiated" transactions does, however, apply to composite checks and regular debits of an account to a third party, which together constitute a major component of financial institutions' EFT transactions (Brandel, p. 1222). Currently, it is not cost-effective for banks to alter their systems to avoid compliance with Regulation E's requirements (Brandel, p. 1223).

Regulation E's main purpose is to protect customers who use EFT services. Regulation E sets the standards for disclosures of rules and regulations regarding EFT use as well as for the documentation which the financial institution must provide to its customers who make EFT transactions. The first set of disclosures came in the spring of 1980 when financial institutions distributed the mandatory information to existing EFT customers; all new EFT customers receive similar disclosures (the disclosures are similar to those received by credit card users as a result of the Truth in Lending Act).

From the banks' point of view, the worst aspect of Regulation E's requirements is documentation, i.e., receipts and periodic statements. Regulation E requires that all EFT terminals issue the user a receipt. This almost meant disaster to the innovative banks which first used ATMs which were not designed to issue receipts and were too new to be scrapped. Fortunately, an amendment to Regulation E "grandfathered" these older machines (Regulation E now requires that such machines only issue cash withdrawals and that the bank mail a receipt on the next business day). The amendment also exempts POS terminals from the receipt requirement if the terminal or card can access only one customer account.

The most costly aspect of Regulation E's documentation requirements is the issuance of monthly statements of EFT transactions (Brandel, p. 1226). The original Regulation E requirements have been altered to accommodate previously existing systems of reporting transactions. Currently, periodic statements must show the date that the transaction is debited or credited and the location of the transactions for withdrawals only.

Regulation E further requires that banks provide customers who request, either in person or by phone, information on demand concerning their accounts. Regulation E also gives the customer the right to stop preauthorized debits to his account, either across-the-board or item-by-item. This is difficult enough in a paper economy; in an EFT environment it is almost impossible since the stopped item may be resubmitted, and there is currently no system for identifying resubmitted items (Brandel, p. 1227).

Regulation E also establishes the procedures for error resolution and unauthorized EFT liability. These regulations do not add costs to the financial institution directly, but they are broad, vague, and often contradictory to other laws. For example, many financial institutions issue plastic cards which can be used either as credit cards or ATM access cards. Does the use of such cards fall under Regulation E or the Truth in Lending Act? Congress has yet to resolve this issue. Finally, Regulation E establishes guidelines for EFT card issuance, as well as for the enforcement of the guidelines and the relationship of the guidelines to state laws.

**Antitrust Law**

As mentioned earlier, factors such as capital investment costs, economies of scale, and consumer demand have made it desirable for financial institutions to share EFT systems, especially ATM networks and ACHs. The growth of these networks has been slowed, however, by the antitrust laws. The main concerns of antitrust relative to EFT are entry, access, and anticompetitive practices.

Regarding entry, the central question is: when two competing banks undergo a joint venture to establish an EFT system, could each one have developed such a system independently? If they could, then antitrust laws have been broken, according to the Justice Depart-
ment. The Board of Governors of the Federal Reserve came out with a set of guidelines for banks to follow when establishing joint EFT ventures. In brief, the guidelines say that two or more banks may develop a joint EFT venture if mutual participation is necessary to achieve economies of scale and meet capital requirements (Goldberg, p. 728). To date, no challenges to existing ATM networks have been levied.

Regarding the issue of access to EFT systems, a shared EFT system is apparently legal if and only if any financial institution in the area may participate, either by buying into the venture or paying a “reasonable” fee after its implementation. The access issue is particularly significant to ACHs. If there is only one ACH in a region (this is usually the case), denial of access to it would put the denied institution at a serious competitive disadvantage. This issue was brought to the courts twice by the Justice Department in 1977, when it claimed that two different ACHs (the Rocky Mountain and California ACHs) had violated Section 1 of the Sherman Act (conspiracy in unreasonable restraint of trade) by denying access to credit unions and S&Ls. The Justice Department won both cases, and today all ACHs allow full access to all financial institutions in the area.

History has shown that joint ventures in business often lead to anti-competitive practices (Goldberg, p. 731), such as price fixing, tying agreements, and market allocation. There is no reason to believe that shared EFT systems are not susceptible to such practices; and the creators of such systems must be very careful in the way they operate, or they will surely face prosecution for anti-trust violations.

Federal Bank Branching Law

When a law passed in 1927 and amended in 1933 is applied to the technology of the 1970s and 1980s, there is bound to be trouble. So it is with the McFadden Act and ATMs. Is an ATM considered a “branch” under the McFadden act and therefore subject to branching law? The first decision on this issue came in 1974 when the Comptroller of the Currency decided that for nationally-chartered S&Ls, ATMs were not branches and therefore not subject to branching law. This controversial ruling was overturned in 1976 when the District of Columbia District Court, in Independent Bankers Association of America v. Smith, ruled that ATMs are branches (the Court of Appeals upheld the decision; the Supreme Court refused to hear the case). However, the Smith ruling only applies to ATMs which are directly owned or leased by the bank for use by its customers only. Financial institutions that participate in networks such as Cirrus or MAC are not limited (yet) in number of machines allowed. To date there has been no legislation or court cases concerning shared EFT systems.

State Branching Law

The McFadden Act only applies to nationally-chartered banks; state-chartered banks are subject to the state’s own branching law. In the absence of federal legislation, the states have given themselves the privilege of regulating EFT systems, especially ATM networks, as well. As of 1982, thirty-two states had enacted EFT legislation, five defining ATMs as branches, thirteen saying they are not branches, and fourteen taking no position. This confusion of laws will certainly impede the development of efficient interstate EFT systems, unless and until federal legislation is passed.

Non-Bank Banks

The regulatory confusion over “non-bank” banks which has developed over the years has carried over to EFT regulation. There are nine different regulators of financial institutions, and four of these (the Comptroller of the Currency, the Federal Reserve Board, the Federal Home Loan Bank Board [governing S&Ls], and the Nation Credit Union Administration) have set policies regarding the establishment of EFT systems. As a result, different financial institutions have different regulations to follow, creating unfair advantages where restrictions are less stringent. For example, federal S&Ls are not only free from state branching laws, but they are also allowed to join the EFT systems of other institutions at will. Rather than working for the good of all, technology is selectively rationed out through the barriers of regulation.

Since different depository institutions
operate and earn money in different ways, it is understandable that they are regulated by different agencies. However, each provides the same basic service inasmuch as new technology is concerned: electronic manipulation of account-holders’ funds. Therefore, each can and should offer EFT services to its customers on an equal opportunity basis if, of course, it is advantageous to all involved.

Evaluation

The more unified EFT services are (e.g., one ATM network with all financial institutions as participants and accessible by all account holders) the better off customers would be for two reasons. First, nationwide EFT systems would mean greater economies of scale, leading to reduced costs to banks, which would in turn be passed on to customers in the form of lower service charges or higher rates on accounts. Second, national electronic banking systems increase the efficiency of services provided to customers. For example, customers would have greater access to ATMs, since every ATM would be usable by every customer. Also, there would be reduced waiting time for check-clearing (via a national ACH). Since EFT regulations have impeded these developments, it is this author’s opinion that EFT regulation has been extremely detrimental to the consumer and the economy. Nationwide, all-encompassing EFT services are made difficult to establish by the existing Federal Reserve regulations and may be illegal by the antitrust laws. Establishment or participation in a shared EFT system is almost always cost-effective to the bank (Martin & Clark, p. 28); and since cost reductions are passed on to the consumer, it is clearly desirable to foster the expansion and unification of EFT systems. One cheap ATM network, a national ACH, and perhaps a POS system would be of enormous benefit to both the consumer and the merchant. Instead, the regulatory jungle has given us forced competition, resulting in higher costs and restricted accessibility.

But just how detrimental have the regulations and restrictions been to the American banking industry? What price have we really paid? For those answers, we now turn to our northern neighbors and their alternative to detailed regulation.

Laissez-Faire: The Canadian Alternative

As stated previously, Canada has traditionally advocated self-regulation through independent organizations within the industry over government regulation. As a result, government regulation in EFT technology is very limited. Canadian bankers are especially proud of their free-market success and deplore the idea of government intervention (Berard, p. 20). There are, however, Canadians who advocate regulation of financial institution technology. The main fear of these advocates of regulation is that each bank would develop its own system. These systems would be incompatible, rendering the highly efficient Canadian check-clearing system useless.

The Canadian banking industry is based on limited legislation which is mostly decades old. Canada has never engaged in massive regulation, and hence has experienced no deregulation such as the American Depository Institutions Deregulation and Monetary Control Act. However, a brief review of what Canadian legislation does exist is in order.

Background Legislation

There are four pieces of legislation which together have established the Canadian banking system as it exists today. The Bank Act established the structure and powers of individual banks. Until a 1980 revision, the Bank Act permitted only banks established in Canada to receive Canadian charters. These thirteen Canadian-chartered banks are the giants of Canada’s capital markets. The Bank Act also established a reserve system very similar to the American system. The Bank of Canada, the central bank supervising the reserve system, was created through the Bank of Canada Act.

Besides the basic market structure (i.e., oligopoly versus competition), the major difference between the Canadian and American banking systems is in the clearing of checks. The self-regulatory agency in Canadian banking was created by the Canadian Bankers’ Association (CBA) Act. This act empowers the CBA
to set up and manage clearing houses and to establish the rules and standards for the clearing of checks. The by-laws of the CBA laid down the basic clearing and settlement rules; these by-laws cannot be modified without government approval. Finally, the Bills of Exchange Act set the rules and obligations of check writers, cashers, and banks in handling the checks passing through the Canadian check-clearing system.

These four pieces of legislation are all many decades old. Although they have been amended frequently, there have been no amendments or additions or any new legislation overseeing ATMs, EFT, or POS.

**The Blue Book**

Despite the success of the Canadian check-clearing system, the fears of growing incompatibility finally penetrated the Canadian government in January of 1975, when the Ministers of Finance and Communications issued the policy statement *Towards an Electronic Payments System*, commonly referred to as “The Blue Book.” In it, the federal government gave itself the responsibility of “guiding the evolution and management of the Canadian payments system” (Crean, p. 12). Notice that the government is to simply “guide,” not to implement or to dictate the structure. It would be the responsibility of the industry to set up and maintain the system. Specifically, the Canadian government recommended a single, nationwide, publicly-accessible communication network, the fees for which would be proportional to the amount of the system that each bank utilized. The benefits of such a system, the government claimed, would be the guarantee of equity through access as well as the development of a reliable communications system which would be expandible, as well.

The Canadian banking industry opposed the government’s recommendations for two reasons. First, the implementation of such a system would have been far too costly to be worth the investment. Each bank’s entire system would have had to be converted or replaced in order to interface with the new national system. Since communication costs represent only about 10 to 15 percent of a bank’s total data processing costs (Crean, p. 15), it was highly unlikely that the banks could have recovered their capital expenditures for such a system.

The second reason that Canadian banks opposed the Blue Book recommendations was that the system of check-clearing already present was highly efficient and relatively inexpensive even without the Blue Book’s proposed changes. The current Canadian check-clearing system requires no electronic interfacing or telecommunications between banks. In the Canadian system, deposited checks and the summary data (stored on magnetic tape) are physically delivered every day from bank to bank through regional clearing points. (There are ten such points, which are really small back offices of a bank in each major city.) Of course, technological advancement is present in the Canadian check-clearing system, but it is at the ends of the process, not in the middle, where automation has made its mark. Each bank is constantly improving its in-house systems of sorting and processing the checks that it transfers and receives. The interbank part of the process, however, stands to benefit little from technological advancement. Fortunately, the Blue Book recommendations were never adopted.

**Evaluation**

Check-clearing systems are not well-understood by the general public, nor need they be. Technology has not played as large and as revolutionary a role in Canada as it has in the U.S. through ACHs. But this is only one application of technology in banking; the other realms have not yet been analyzed. This paper has already shown how regulation in the United States has inhibited the technological improvement of banking. Moreover, since there has been no government intervention in the area of technological innovation in Canadian banking, it can be assumed that Canada’s progress in this area has been regulated only by the free market.

A priori, one would probably expect there to be a slower development of ATMs in Canada, since there are 22% more branches per capita in Canada than in the U.S. (Crean, p. 20). In fact, however, the rate of ATM development has
been much higher in Canada (Bradford, p. 61). For example, national ATM networks have existed in Canada since 1978, eight years before they appeared in the U.S. It can be inferred from these data that it has been the lack of fragmentation from differing branching laws and the minimal regulatory interference which have been the causes of Canada’s more rapid utilization of ATMs.

The high efficiency of the Canadian check-clearing system has also eliminated the need for ACHs in Canada. Except for improvements by the individual banks in their in-house processing of checks, technological innovation has not radically altered Canadian check-clearing.

POS has encountered the same obstacle in Canada as in the U.S., namely lack of interest. Apathy towards POS is even more pronounced in Canada, however, because of the efficient check-clearing system, as well as the high accessibility of credit cards, the nationwide distribution of bank branches, and the widespread presence of ATMs.

The high efficiency of the Canadian banking industry stems largely from the freedom of Canadian banks to establish branches throughout the provinces. Many of the banking problems of American customers are the direct result of the absence of nationwide bank branching. In Canada, therefore, ATMs are not very beneficial as substitutes for branches, since branches are more readily available than in the U.S. Furthermore, because of the structure of Canadian check-clearing, the Canadian banking industry would gain nothing from an ACH system similar to that of the U.S. Without the restrictions present in the American banking industry, technology is not needed to the extent that it is in the U.S.

Perhaps the best way to describe the application of technology to the Canadian banking industry would be to say that it has been evolutionary rather than revolutionary. Technology has been used to improve Canada’s already efficient system rather than to provide new systems. Instead of providing new services that are not needed, Canadian bankers are striving to reduce costs. This has led both to higher profits for bankers and to reduced service charges for customers. Technological innovation with respect to Canadian banking would thus appear to be a case of making a good thing better.

**Conclusion**

At first glance, it would seem difficult to compare the development and implementation of technology in the Canadian and American banking industries, since the two countries have not used technology in the same ways. However, the differing applications of technology appear to be the result of differences in the structures of the two industries. Moreover, since these different structures have arisen from dissimilar policies regarding government regulation, it is possible to evaluate the effects of regulation by observing to what extent technology has counteracted regulation. In other words, if technology undoes the damage of regulation, then the more technology is applied, the more damage has been done.

Because of technology, a New Yorker can now access his account while in California through an ATM. A Canadian from Halifax may access his funds while in Vancouver from an ATM as well, but he has always been able to access his funds anyway, since there will certainly be a branch of his bank there. Technology has begun to overcome the restrictions imposed by U.S. bank branching law, so now Americans have almost as much access to their accounts as Canadians do.

Technology has permitted the creation of ACHs in the United States. Despite regulatory legislation regarding ACHs, they have both facilitated and accelerated the check-clearing process in the U.S. No ACHs exist in Canada, because of the remarkably efficient check-clearing system already in place there. Although the U.S. is still far behind Canada with respect to accessibility and speed, technology has helped close the gap.

POS has not been widely developed either in the U.S. or in Canada. POS development in the U.S. has been hindered by implementation barriers, such as the heterogeneity of electronic systems. In Canada, on the other hand, POS is not popular simply because there is no interest or need for it. Due to the large number of branches and the efficient check-clearing system, there is no motivation for installing or
using POS systems. Indeed, POS may someday be commonplace in the U.S., but again it will only close the efficiency gap with Canada that has been created by regulation.

In fact, there is no reason to believe that the United States could not have developed a banking system equal or superior to that of Canada if it were not for regulatory interference, especially regarding branching. Until American banks are allowed to operate at the national branching level, technology can only be used to enable U.S. banks to catch up to those in other countries. It is, therefore, clear that regulation has served to the detriment of the U.S. banking industry and to the U.S. consumer.

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