

Issues and Prospects for Payments Systems Deregulation

by

Gautam Gowrisankaran

This version: June 15, 1999

Gautam Gowrisankaran is an assistant professor of economics at the University of Minnesota. The author thanks Ed Green, Tom Holmes, Mark Sniderman, James Thomson, and several members of the research staff at the Federal Reserve Bank of Cleveland for helpful comments and John D. Hueter and Sunaina Kilachand for research assistance.

Abstract

The check clearing and electronic payments systems market are regulated and dominated to various degrees by the Federal Reserve System. This article examines the theoretical and empirical implications of a potential deregulation of this market within the context of three broad effects: price discrimination, network externalities, and anticompetitive pricing. While these are all legitimate concerns, both the theoretical literature and empirical examples from other industries show that it is probable that deregulation would significantly improve the market's allocative and technological efficiency. Thus, deregulation of the payments systems market should be investigated further.

Introduction

It is a surprising empirical fact that despite the rapid technological change of the last decade, checks are still the dominant retail payments instrument. Their continued dominance has led researchers to speculate that the Federal Reserve System could increase access and efficiency to the payments systems market by modifying incentives for both paper-based and electronic payments. To generate such incentives, one option that the Federal Reserve Board of Governors could consider is deregulating parts of the payments services. In this paper, I focus on the potential deregulation of check clearing and automated clearinghouse (ACH) services.

To understand the possible impacts of deregulation, it is useful to summarize the current market structure.¹ Payments systems are currently organized as a regulated industry. As regulator, the Federal Reserve Board has authority over the competitive conduct of the 12 Reserve Banks. While the Board is a federal agency, the Federal Reserve Banks themselves are private, independently chartered, not-for-profit corporations. Accordingly, there are two ways to deregulate payments services: by eliminating some or all regulations imposed on the Federal Reserve Banks for their provision of payments services or by eliminating entirely the Banks' mandate to perform these services. Because this article's sole purpose is to explore some of the potential economic consequences of changes in the payments systems, I do not distinguish between these two alternatives, but instead apply the broad term "deregulation" to both of them.

¹ See Green (1997) for more details.

Why should the Federal Reserve Board consider deregulating check clearing and ACH services? The simple answer is that rapid technological change has enhanced the market's ability to develop payments systems that are better in both a technological and an allocative sense. Centralized organizations may lack the knowledge or incentives to develop efficient systems and pricing mechanisms, but the profit motive of the market will encourage innovators who have the necessary knowledge and capability. A market-based payments system that broadens the scope for competitive pricing therefore has the potential to develop widely useful electronic banking services and to lower check clearing prices, changes that might not occur within the retail payments system.

Despite the general notion that markets can achieve efficient outcomes, this is not always the case. In particular, there is evidence that payments systems are characterized by both network externalities and increasing returns to scale. Economic theories predict that either of these conditions may lead to a market failure, in which a deregulated industry may underprovide and/or overcharge for certain services, which would produce an inefficient outcome. While it is certainly possible that some deregulation could increase the allocative and technological efficiency of payments systems, it is not a certainty.

Thus, in determining whether deregulation is likely to create more efficient payments systems and pricing, we cannot rely on generalities about the promises of free markets, but instead must analyze the specifics of the structures more deeply. Fortunately, modern economics, in the form of theoretical and empirical industrial organization research, has much to say about how different types of markets perform. Using theoretical

and empirical examples, this paper outlines some of the issues and tradeoffs that would result if payments systems were deregulated.

While deregulation can transform payments systems through many related mechanisms, I have chosen to separate the discussion into three effects. The first is price discrimination, a frequently misunderstood concept that refers to firms' ability to vary their prices according to different consumers' willingness to pay, instead of according to costs. The second is network externalities, through which a market failure can occur because private firms' incentives to develop new electronic payments systems may be socially suboptimal. The third effect is anticompetitive pricing, which raises concerns that deregulation might reduce access to the check processing system for banks in remote areas and lead to overpricing of future electronic banking products. The remainder of this paper devotes a section to each of these three effects, with a brief conclusion.

I. Price Discrimination

Economists define price discrimination as the situation that occurs when firms charge different consumers of the same product different prices on the basis of elasticity of demand (or willingness to pay).² Among the many examples of price discrimination are coupons in supermarkets (where discrimination is based on the amount of time the consumer is willing to spend searching circulars) and discount movie tickets for senior citizens (where the discrimination is based on age). Firms use price discrimination because it will increase profits by capturing a higher price from people whose demand is

² It is important to remember that setting prices higher when costs are higher is not price discrimination.

less elastic (such as shoppers who do not clip coupons), while still enabling them to sell to consumers with more elastic demand (those who would not buy without coupons).

Price discrimination has both distributional and welfare effects. Economic theory holds that the welfare effects of price discrimination in an oligopolistic market are uncertain.³ This is apparent in the coupon example: Price discrimination will lower the price paid by coupon clippers, who might not otherwise have purchased the good. Because the after-coupon price presumably would not be lower than the marginal cost, price discrimination raises sales volume towards the socially optimal level, increasing total welfare. However, nonclipping consumers are likely to face a higher price than if coupons were banned, so they are worse off with price discrimination than without. Thus, while price discrimination here makes some consumers worse off, it also raises the total welfare level and makes the supermarkets and some consumers better off. The latter effects -- price discrimination's ability to be a positive phenomenon and increase social welfare -- are often overlooked.

There is much empirical evidence that oligopolistic industries exhibit extensive price discrimination after deregulation, and any attempt to predict pricing in a completely deregulated check clearing market must examine the consequences of such discrimination. One important example is the airline industry which, following the Airline Deregulation Act of 1978, moved from a system where the government set prices on each domestic route to one where every company was free to set its own prices.⁴ The resulting price structure incorporates a huge amount of price discrimination. Prices have

³ See Holmes (1989) for details.

⁴ See GAO - RCED-96-79.

become segmented according to many criteria including how far in advance the traveler is willing to purchase a ticket, whether she will stay over on Saturday night, and so on. The net result has been huge growth in the number of passenger miles and trips flown,⁵ far outstripping the effect of any purely technological change. While the average price per passenger mile has stayed relatively constant,⁶ the variance in prices has widened enormously, with walk-up business travelers paying much higher fares than other customers. The vastly increased quantity of air travel strongly suggests that deregulation has increased overall welfare dramatically. However, it is also clear that some groups, such as business travelers, may not have benefited.

The Federal Reserve Banks are currently significant players in check clearing, with a total market share of approximately 33 percent.⁷ By enforcing regulated rates at which the Reserve Banks are obligated to provide an unlimited quantity of check clearing, the Federal Reserve Board limits private clearinghouses' ability to raise prices and price discriminate as well as the Banks' ability to lower prices and compete with private clearinghouses that enter the market. The airline example thus points out three likely effects of deregulation: price discrimination will increase enormously; firms will find new methods of price discrimination; and the overall welfare level may rise.

The airline example differs from the market for check clearing in that airfares were once completely regulated, while private clearinghouses' prices are not regulated. A closer analogy to the current situation exists in the market for long-distance phone

⁵ Government estimates show more than a 50 percent rise in quantity from 1979 to 1994; see GAO - RCED-96-79.

⁶ Government estimates show a 10 percent drop in real price from 1979 to 1994; see again GAO - RCED-96-79.

services. Following partial deregulation of that industry in 1984, AT&T was still constrained to charge prices set by the FCC although its competitors, such as MCI and Sprint, were unregulated.⁸ The market for long-distance phone calls in the early 1980s was comparable to the market for check clearing today, because AT&T's market position then was very similar to the current status of the Federal Reserve Banks. Following its complete deregulation, the long-distance phone industry, like the airlines, greatly increased price discrimination. Much of the market segmentation for long-distance calling is based on consumer knowledge and willingness to shop around. For instance, a recent *Wall Street Journal* article pointed out AT&T has a plan with rates 33 percent lower than their advertised 15-cent fixed rate, but this plan is available only to customers who inquire persistently about it.⁹ The overall effect of deregulation has thus been similar in the phone and airline industries: The huge increase in price discrimination has caused substantial gains in the quantity of long-distance calls and in total welfare, but little noticeable change in average price.

Despite the benefits of price discrimination, one may worry about its distributional effects, particularly on check clearing for banks in small markets and rural areas. As the Federal Reserve Banks have a very large share of these markets,¹⁰ the check clearing rates that they charge must be lower than those unregulated firms are willing to charge, given that the Reserve Banks are in the market as regulated providers. Consequently, some fear that in the event of deregulation, price discrimination might

⁷ See Furash and Company (1994, p. 43)

⁸ See Faulhaber (1987) and Crandell (1991).

⁹ See Kellar (1997).

¹⁰ While exact market shares are not available, this is generally believed to be true.

force these banks to pay exorbitantly high rates for check clearing. In this view, small markets are a potential market failure that only continued regulation can solve.

This fear of small-market failure is unwarranted for two compelling reasons, one theoretical and one empirical. First, were the Federal Reserve Board to deregulate the market, the check-clearing rates charged to small banks might increase, if an unregulated market were not willing to provide the service at the same cost. However, it is not at all certain that rates would rise: Although no unregulated firm is willing to enter this market given the current price, this might be because increasing returns make only one firm viable, not because the Reserve Banks are forced to set prices lower than what the market would charge *in the absence of a regulated firm*. Thus, it is entirely possible that prices would remain the same were deregulation to occur. Even if they were to rise, the likely reason would not be price discrimination but rather that costs are higher in small markets. Charging higher prices for services that cost more is *not* price discrimination and, furthermore, makes perfect economic sense. If deregulation of the check clearing market were to result in a price rise for this service, it would likely *increase* social welfare. While some might consider a welfare increase that results from a price rise to be an abstract theoretical concept, I argue in section III that this is not the case; a price rise could spur development of new banking products whose use is warranted.

For empirical evidence to counter fear of market failure, I return to the airline example, which offers an exact analogy: flights to small cities in remote areas. Many observers predicted that deregulation would result in very high prices and/or discontinued service on these routes, but they were wrong. Between 1979 and 1994, real prices for small markets fell 9 percent, which is almost exactly equal to the average drop in fares

during the same period.¹¹ The reason is that consumers in small markets do not have the most inelastic demand: rather, it is business travelers, who disproportionately travel from larger cities, whose demand is the most inelastic.

The conclusion I draw is that while price discrimination will have distributional consequences, small market banks are not particularly likely to pay the most over their marginal cost. Furthermore, examples from other industries suggest that deregulation can result in much greater output and hence a much higher overall level of social welfare.

II. Network Externalities

Network externalities are another widely studied economic phenomenon that affects development of new banking products. A good is said to exhibit network externalities when its utility to a consumer depends on the number and characteristics of its other consumers. There are many examples of goods with network externalities. For instance, the utility from purchasing a VCR may depend on the number of rental movie titles available, which in turn depends on the number of VCR owners. Similarly, the utility from owning a car may depend on the availability of gas stations, and the utility from a credit card may depend on the number of businesses that accept it.

Economists care about network externalities because there is a potential for market failure when they are present: Firms' incentive to develop a product will be socially suboptimal unless a sufficient network for that product already exists. Alternately, by selling a good that exhibits network externalities, firms confer a benefit on its past and future purchasers, because their utility increases with the amount sold.

¹¹ See GAO - RCED-96-79.

However, firms cannot capture these benefits because they accrue to individuals who are not their customers. This means that the market will tend to underuse goods with network externalities and consequently to underinvest in developing new technologies for such goods.

It is widely agreed that electronic payments systems in general and ACH in particular are subject to significant network externalities because ACH can be used only if both payer and payee are set up for it. Hence, the benefit from ACH increases with the number of system users, but the costs of using it include a substantial fixed-cost component, which is largely invariant to the number of users. While the fixed cost includes the physical equipment necessary to send or receive payments, a much larger component will probably be the training costs of using ACH and learning the mind-set of an electronic banking system.

There was thus a clear mandate for establishing ACH: Network externalities were present, the private market was likely to underprovide electronic banking services, and the Federal Reserve Board stepped in to correct the market failure. In addition, ACH still accounts for a small share of all noncash financial transactions, and many businesses and consumers currently do not use it. One could argue that there is still a large network externality (in terms of training and acceptance) associated with ACH and hence a large role for the Federal Reserve Board in future payments systems.¹²

However, the theoretical and empirical literatures are at best mixed in their support for an activist policy. The main theoretical argument against government

¹² Bauer and Hancock (1995) find that there are still substantial untapped scale economies in ACH.

intervention in payments systems technology is that the social planner (in this case, the Federal Reserve Board) may lack the knowledge to develop an appropriate system. An inferior or premature system would produce a socially suboptimal outcome by crowding out the demand for an optimal market system, and thereby would vastly reduce welfare.

It is thus useful to look to other industries for the empirical implications of different policies. Three general approaches have been tried in other industries with network externalities: developing and/or sponsoring development of new products; devising voluntary standards for new products; or doing nothing at all.

The original ACH system is probably the most relevant example of a planner directly developing a new system with network externalities. While economists will undoubtedly debate the positive and negative impacts of ACH for years, a few facts stand out. The demand for ACH has been much lower than initially predicted, and its use has barely eroded the volume of checks. Indeed, ACH still accounts for only 4.37 percent of noncash financial transactions, compared to a 77.4 percent share for checks,¹³ although the payer and payee costs of using ACH are far lower than those for checks.¹⁴ In addition, as the recent Wells (1996) study convincingly shows, the reason for low ACH use is not check float or any market failure between institutions capable of making ACH payments. The economic implication is that the majority of payments customers would simply prefer checks to ACH, even if their prices were identical. While it is also true that some other electronic payments mechanisms --such as point-of-sale debit technology -- have had disappointing growth, the ACH experience contrasts sharply with the use of credit cards

¹³ See Bank of International Settlements (1995).

¹⁴ See Berger and Humphrey (1988) for details.

and ATM cards, where rapid cost reduction resulting from new technology has produced a sea change. The implication is probably that consumers' dislike of ACH does not represent an aversion to electronic payments mechanisms in general. All of these factors suggest that it is entirely possible (though by no means certain) that substantial crowding out has occurred. In the absence of ACH, the private sector would have developed an electronic payments system that would have been greatly preferred to ACH and much more widely used. There is also evidence that small private electronic payments systems in New York and Arizona are contemplating large expansions in scope; thus, deregulation may only accelerate a privatization process that is already underway.

A more recent example of government encouraging an innovative technology through direct development of a new industry is Japan's High Definition Television (HDTV) market.¹⁵ HDTV technology allows broadcasting with a much higher resolution than is currently available. Between 1964 and 1989, the Japanese government spent \$700 million developing HDTV technology; unfortunately, the mechanism it chose was an analog system with very high costs to users and broadcasters. Giant advances in computer technology over the last decade created efficient digital data transmission and compression algorithms that made a digital HDTV system feasible, and a private consortium of researchers in the United States developed such a system at little cost to the government. Because the digital system was much cheaper and better, Japan's government ultimately abandoned its analog system and agreed to use the digital one.

¹⁵ See, for instance, Hart (1994) for details of HDTV development.

Having focused all its early efforts on analog, Japan was left behind in digital HDTV development -- a costly mistake.

In several other instances, governments and other organizations have set up voluntary standards for new products with network externalities, in order to encourage compatibility and avoid multiple networks. A prominent example is facsimile (fax) machines, for which international committees established data transmission and compression standards that are periodically updated to allow faster transmission. These standards, which guarantee that all fax machines can communicate with one another, have ensured the technology's rapid acceptance. To quantify the importance of these standards, I note that faxes are much more widely used than e-mail messages for long documents,¹⁶ despite e-mail's large cost advantage and technological superiority. One plausible explanation is that there are several compression standards for e-mailing files (for example, Mime, BinHex, UUEncode), but no standard method. The lack of standardization has discouraged development of efficient tools for using e-mail to transmit long document and this, in turn, has caused consumers to use more faxes relative to e-mail than would be socially optimal. The implication is that developing a standard solved a large part of the network externality problem for faxes.

From the fax example, one might conclude that sanctioned standards are necessary to ensure widespread use of products with network externalities, but there are many empirical examples to the contrary, most notably VCRs. Initially, they were manufactured with two competing, noncompatible standards, Betamax and VHS, but

Betamax lost out, and over time VHS and its refinements became dominant.¹⁷ While it is certainly possible that VCRs would have had higher sales if there had been an officially sanctioned standard from the beginning, they nonetheless gained such widespread acceptance that they are now considered a mature market, not a growing one.

In the case of VCRs, only one standard survived, but there are also examples of industries where several competing standards coexist and thrive. One such industry is credit cards, whose many competing standards include MasterCard, Visa, American Express, Discover and Diner's Club. ATM networks have yet another evolutionary history. While a number of networks persist (for example, MAC, NYCE, Cirrus, PLUS), individual ATM machines have increased their compatibility across networks. The conclusion is that many industries with network externalities have managed to flourish without any policy intervention and have evolved into a variety of market arrangements.

Although a number of other industries exhibit network externalities, many experts feel that the closest technological analogy to electronic payments systems is the long-distance phone network, because both these systems transmit information from station to station on their networks in similar ways. After several years of deregulation, the long-distance phone industry is now characterized by different private networks, each owned by a different major competitor. The networks are proprietary and physically distinct from one another, but calls are seamlessly routed through the various networks using established interconnection standards. In addition, many smaller market players can

¹⁶ While the exact usage is hard to measure, a 1995 study by the Yankee Group estimated that in that year, fax and modem usage generated 50 times more revenues than digital phone lines, which suggests that faxes are a still more than one order of magnitude more common than e-mail.

¹⁷ Park (1997) analyzes the effect of network externalities on the VCR market.

compete simply by leasing bandwidth from firms with networks. While deregulation initially caused some temporary disruptions in service, the end result is a highly reliable network. Comparisons to Canada, Western Europe, and Japan, all of which have been much slower to deregulate their long-distance phone industries, suggest that U.S. deregulation permitted vastly higher quantities and lower prices, producing a huge welfare gain.¹⁸ The recent international treaty¹⁹ deregulating long-distance phone networks worldwide further attests to deregulation's success in this industry. Because of their similarity, one would expect deregulated electronic payments systems to evolve into something comparable to the long-distance phone industry. While there would probably be more than one electronic payments network, individual banks and payments institutions would be likely to choose one network or several, and customers on any network would be able to make payments seamlessly to customers on any other.

We can conclude that while network externalities may lead to a market failure in the absence of government intervention, it is not at all clear that governments can counteract them by developing new products. The ACH and HDTV examples show that such attempts may actually do harm by crowding out high-quality private provision of these goods. As to encouraging development of voluntary standards, the conclusion is more mixed: In certain cases, development of voluntary standards appears to have spurred usage of a new, socially desirable technology; in other cases, products have gained widespread acceptance, even without such standards.

¹⁸ According to FCC-IB Docket No. 96-261, the average U.S. domestic long-distance call now costs only 13 cents per minute.

¹⁹ The World Trade Organization Agreement on Basic Telecommunication Services, signed at Geneva on February 15, 1997, will take effect at the beginning of 1998.

III. Oligopolistic and Anticompetitive Pricing

A possible reason for the Federal Reserve Board not to deregulate the payments systems market is anticompetitive pricing. Economic theories predict that an industry characterized by one firm (a monopoly) or few firms (an oligopoly) will tend to have higher prices than a comparable industry with many firms. The reason? There is market power in prices: By decreasing sales below the competitive level, an oligopolist or monopolist can cause a price increase that will allow it to charge more for its entire customer base. The degree of market power is influenced primarily by the level of competition, but modern economic theories such as contestability and limit pricing indicate that *potential* competition in the industry is often a more accurate measure than the actual number of competitors.²⁰

To investigate the possibility of anticompetitive pricing, it is most useful to examine which parts of payments systems are likely to be controlled by a small number of actual and potential firms. As the issues for checks and electronic payments systems are different, I split the discussion into a separate analysis for each.

Check Processing Services

The central anticompetitive concern regarding price deregulation of check processing services is that banks in small markets will face anticompetitive prices when they try to purchase check clearing services. This fear is based on the general assumption that the check clearing market has substantial fixed costs and consequently has increasing returns to scale. In addition, as I outlined in section I, almost all checks for banks in these

²⁰ See Baumol, Panzar, and Willig (1982).

markets are processed through the Federal Reserve Banks. Thus, there is a sense that few (if any) private firms would wish to participate should deregulation occur and, because the number of firms is likely to be small, that the potential for anticompetitive pricing and deadweight loss is significant.

While this argument has some intuitive appeal, I do not believe it is valid. If the Federal Reserve Board were to leave the market, firms which are currently crowded out by Board pricing policy would probably enter. Although no private firms would want to provide below-cost check clearing services for small markets, there are many clearinghouses capable of providing services to these markets if the price were adequate. A leased truck or plane is a sufficient, inexpensive method of transporting checks from small markets to large banking centers. In addition, the continued rise of interstate banking ensures that many potential providers of check clearing services will have the knowledge and interest to do long-distance clearing. Consequently, this market would hardly suffer from a dearth of potential competitors. While the low volumes inherent in small markets make it quite likely that only a few firms would enter, the large number of *potential* competitors (which includes any private check processing center) severely constrains anticompetitive pricing in this market.

Another argument commonly advanced against deregulation is that banks in small markets would not have access to fair prices for check clearing services because they might have to purchase these services from competitor banks that have an incentive to overcharge them or even to steal their most valuable customers. There is certainly merit to the notion that without regulation a firm might overcharge its competitors for a service in which it has a monopoly, in order to discourage entry and encourage exit. Pricing of a

monopoly service is often regulated. For instance, in the ongoing deregulation of local telephone service, the Federal Communications Commission proposed mandatory rates at which the regional Bell operating companies (such as NYNEX and USWest) must lease their loop lines to competitors to avoid overcharging.²¹

However, this analogy does *not* apply to check clearing. There is exactly one regional Bell operating company from which a local telephone entrant can lease the loop to a customer's house, but there is no single bank from which small banks must purchase check clearing services. A small bank can purchase check clearing services from many competitors, none of which can overcharge lest the small bank shop elsewhere. Furthermore, a competitor cannot steal a small bank's customers without providing better service or a lower price. If it leads to higher quality service or a more attractive price, this competition will benefit customers and thus be likely to increase welfare, unless competitors are engaged in a predatory strategy and intend to raise prices later. Economic theories indicate that predatory pricing is only optimal under a very narrow set of circumstances,²² such as uncertainty about competitors' payoff structure, which rarely occur in this industry.

The correct analogy is not the market for local telephone service but rather the market for long-distance communication bandwidth. While a few firms control most of the long-distance capacity, there are hundreds of competing long-distance service providers, most of which do not have their own networks. Instead, they survive by leasing bandwidth from one or more of their competitors at discounted rates and reselling it to

²¹ See, for instance, Strategic Policy Research (1997) for a study of the FCC proposed rates.

²² See Kreps and Wilson (1982) for details.

consumers. They are able to purchase the use of competitors' networks at discounted rates precisely because there is more than one firm with long-distance capacity. This example shows that when at least a few competitors are selling a service, purchasing it from one of them need not involve paying anticompetitive prices.

Finally, I note that it is likely that costs for check clearing in remote areas are currently quite high relative to costs in large cities. By enforcing lower prices for check clearing services in remote areas, the Federal Reserve Board's regulatory structure could be crowding out what is probably a natural market for electronic payments. Were a deregulated check clearing market to charge more, electronic services would very probably gain a large market share. Reconsider my earlier analogy to airline service in small markets: While many industry observers feared that deregulation would discontinue flights to many small destinations, this did not happen. Instead, the airlines discovered that they could provide more frequent service by using smaller planes; the result has been greater convenience for small markets.²³ In this case, the structure of the service changed to meet competitive pressures.

Electronic Payments

The issues for anticompetitive pricing of electronic payments products are quite different from those for checks. Pricing for banks in small markets is not a problem, because the products' electronic nature means that physically remote areas are no harder to serve than any other market. However, network externalities create the possibility that only one or two electronic payments systems might be viable, leading to fear of

²³ See GAO - RCED-96-79.

oligopolistic pricing. Because private electronic payments systems are few, there is no direct empirical knowledge of what the ownership and price structure for a deregulated market would be. The empirical evidence on oligopolistic pricing for other industries with network externalities is mixed. Economists do not generally believe that long-distance networks or credit card companies earn large rents from their services except through price discriminating behavior, which imposes minimal social costs. On the other hand, some economists do consider Microsoft an example of a firm that earns substantial rents because its Windows and DOS operating systems are the dominant products in this market.²⁴

Despite the ambiguous evidence from other industries, there are reasons to anticipate that anticompetitive pricing for electronic payments products would not be a significant problem. Most notably, checks are a good substitute for electronic payments products. Thus, while it is possible that a deregulated electronic payments market could be controlled by a small number of firms, these firms could not overcharge for their products beyond a certain amount. If they tried to do so, customers would switch to using checks. Hence, the price of checks provides a bound on anticompetitive pricing in a deregulated electronic payments market.

There is another, even more compelling, reason to expect deregulating electronic payments systems to have socially beneficial effects. Consider the perceived worst-case scenario for deregulation: A few years hence, a hugely profitable, dominant, private electronic payments system captures a substantial share of the *total* payments market,

²⁴ See Gleick (1995).

including both checks and electronic payments. Although the firm that developed this system is earning large rents or profits, this scenario does not imply a deadweight loss. Introducing an additional product cannot make people worse off, even if that product is priced anticompetitively. On the contrary, the fact that the majority of people use this system in preference to checks implies that its quality and price make it superior to checks and hence that people are much better off.

While the above argument is theoretical, an empirical example illustrates this story. As the maker of MS-DOS, Windows 95, and Windows NT, Microsoft is the preeminent firm in personal computer operating systems. The company achieved market dominance by creating a family of technologically superior operating systems that could run on a wide variety of hardware platforms and support a large range of software, and it uses its dominance to earn huge current and expected profits.²⁵ Although these large profits suggest a deadweight loss, I do not believe that this is the case. The relatively small cost of current Microsoft operating systems²⁶ cannot compare to immense technological advances beyond even their own previous generations (such as DOS and Windows 3.1). Thus, had the government regulated Microsoft a decade ago, PC users would probably be paying \$25 less for their computers than they now do, but they would be running DOS instead of Windows 95.

IV. Conclusions

²⁵ See Gleick (1995).

²⁶ While the exact cost of Windows 95 to computer manufacturers is private, Stiglitz (1997, p. 374) estimates that prices do not exceed \$100 per copy. This is less than 5 percent of the average purchase price of a new computer.

In this paper, I have outlined some potential consequences of deregulation by examining the implications of economic theory and taking empirical examples from many different industries. I point out that higher returns make price discrimination likely to increase following deregulation of the check clearing market, and that while this might have distributional consequences, it can enhance overall social welfare. In addition, although network externalities have been offered as a reason for Federal Reserve Board regulation of the electronic payments market, empirical examples indicate that private markets have solved externality problems in some other industries. Finally, although anticompetitive pricing is certainly possible, it will be limited by the large number of potential competitors.

Thus, despite these legitimate concerns, deregulating payments systems can lead to more efficient pricing for services. This allocative efficiency can create stronger incentives for developing new payments systems, which in turn can produce vast technological improvements and a higher level of overall social welfare.

While this paper has pointed out some of deregulation's many potential consequences, it has in no way determined their relative importance. Hence, it cannot answer the question of whether the Federal Reserve Board should, in fact, choose deregulation, which will require much further economic research. Building on the analysis in this paper, such research could use empirical data from the payments systems and other industries, along with theoretical economic models, to analyze when price discrimination, network externalities, and anticompetitive pricing are likely to occur and with what consequences. Because deregulation of the payments system presents a

significant opportunity to enhance access and efficiency, the Federal Reserve should investigate and study it further.

References

Bank of International Settlements, "Statistics on Payments Systems in Group of Ten Countries." *Committee on Payment and Settlement Systems of the Central Banks of the Group of Ten Countries*. (December 1996).

Bauer, Paul W. and Diana Hancock, "Scale Economies and Technological Change in Federal Reserve ACH Payment Processing," *Federal Reserve Bank of Cleveland Economic Review*, vol. 31, no. 3 (Quarter 3 1995), pp. 14-29.

Baumol, William, John C. Panzar and Robert D. Willig, *Contestable Markets and the Theory of Industry Structure*. New York: Harcourt Brace Jovanovich, 1982,.

Berger, Allen N. and David B. Humphrey, "Market Failure and Resource Use: Economic Incentives to Use Different Payment Instruments." *Board of Governors of the Federal Reserve System Finance and Economics Discussion Series 34*, July 1988,.

Crandell, Robert W. *After the Breakup: U.S. Telecommunications in a More Competitive Era*. Washington D.C.: The Brookings Institute, 1991.

Faulhaber, Gerald R., *Telecommunications in Turmoil: Technology and Public Policy*. Cambridge, Mass: Ballinger Publishing Company, 1987.

Federal Communications Commission, "Commission Adopts International Settlement Rate Benchmarks." IB Docket No. 96-261, August 7, 1997.

Furash and Company. "Banking's Role in Tomorrow's Payments System: Ensuring a Role for Banks." *The Bankers Roundtable*. Vol. 1, (June 1994), p.43.

GAO, RCED-96-79. "Airline Deregulation: Changes in Airfares, Service, and Safety at Small, Medium-Sized and Large Communities."

Gleick, James, "The Microsoft Monopoly," *The New York Times Magazine*, November 5, 1995

Green, Edward J., "The Pricing Guidelines for Federal Reserve Payment Services." Mimeo, Federal Reserve Bank of Minneapolis, 1997.

Hart, Jeffrey. "The Politics of HDTV in the United States." *Policy Studies Journal* May, 1994.

Holmes, Thomas J., "The Effects of Third-Degree Price Discrimination in Oligopoly," *American Economic Review*. Vol. 79, no. 1, (March 1989), pp. 244-50.

Kellar, John J., "Best Phone Discounts Go to Hardest Bargainers," *Wall Street Journal*, February 13, 1997.

Kreps, D. and R. Wilson, "Reputation and Imperfect Information," *Journal of Economic Theory* 27, 1982, 253-79.

Park, Sangin, "Quantitative Analysis of Network Effects in Competing Technologies: the VCR Case," Mimeo, SUNY at Stony Brook, 1997.

Stiglitz, Joseph, *Economics*. 2nd. ed. New York: W.W. Norton Company, 1997.

Strategic Policy Research, Inc., "A New Set of 'Top-Down' Incremental Cost Measures," Submitted before the Federal Communications Commission, CPD Docket No. 87-2, February 18, 1997,

Wells, Kirstin G., "Are Checks Overused?" *Federal Reserve Bank of Minneapolis Quarterly Review*. Vol. 20, no. 4 (Fall 1996), pp. 2-13.

Yankee Group, *Honing the Competitive Edge: The Public Network Access Market and Integrated Access Devices*. Bolton, Mass: Yankee Group Data Communications Service. Vol. 16, 1995a (April 1995).