

# Eroding Market Imperfections: Implications for Financial Intermediaries, the Payments System, and Regulatory Reform

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## **Introduction**

Technology, financial innovation, and deregulation are breaking down market imperfections that were the *raison d'être* for the existence of depository institutions. There have been many consequences for the structure of the financial system and the traditional role of depository institutions.

First, changes in communications and information processing and conceptual breakthroughs in the pricing of assets and contingent claims made possible the design, issuance, and distribution of financial instruments and services that would not have been feasible in earlier years. The sheer size and breadth of domestic and foreign financial sectors have enabled these new instruments to have ready markets. Moreover, many financial institutions now have offices worldwide and operate **24** hours a day, and because of technology and communications advancements, the financial activities of these institutions move around the world as one market closes and others open. These developments have reduced the costs of liquefying assets, altered individual and corporate financial asset holdings, integrated foreign and domestic financial markets, and changed the underlying structure of how payments are made.

Second, rapid inflation, rising interest rates, and binding regulatory constraints provided rewards to those depository and nondepository institutions successful in innovating ways to arbitrage those regulatory constraints.<sup>1</sup> Thrifts have entered the transactions account and com-

mercial credit business. Banks now offer a wide array of **time** deposit and mortgage instruments and have significantly broadened their securities activities. Nondepository institutions, such as finance companies, brokerage firms, money market mutual funds, and merchants, have begun to offer full ranges of financial services, including close substitutes for transactions services and commercial credit. The resulting increase in competition has narrowed spreads and reduced the profitability of many banking institutions.

Third, not only have the returns to banking declined but also the risks appear to have increased. For example, the wider array and increased complexity of activities conducted by individual institutions has increased operations risks. The large amounts of substandard and **nonperforming** loans suggests that credit quality has declined. Reduced profitability, especially when considered in conjunction with the increased volatility of interest rates, has increased the variability of earnings and is perceived to be threatening the viability of individual financial institutions and the system as a **whole**.<sup>2</sup> Finally, the rapid growth of large dollar payments and expanded daylight overdraft activity increase risks to the payments system and ultimately to the Federal Reserve as the primary creditor on **Fedwire** and the lender of last resort.

The changing nature of the industry has raised important concerns about threats to the viability of banking institutions and to the stability of **financial** markets and the payments system.<sup>3</sup> These fears have been given greater currency by the increased rate of bank and savings and loan (**S&L**) failures, the insolvency of the Federal Savings and Loan Insurance Corporation (FSLIC) and the increased exposure of the Federal Deposit Insurance Corporation (FDIC), the failure of Continental Illinois Bank, and the volume of underwater third-world debt

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<sup>1</sup> See, for example, Kane (1981), Eisenbeis (1986)

<sup>2</sup> In a paper presented at last year's conference, I argued that many of the present signs of vulnerability were the legacy of past regulatory **policies**. See Eisenbeis (1986)

<sup>3</sup> In his discussion of the paper, Kane (1987) misunderstands the thrust of the second of the two main conclusions of the paper. It **is** not that the system has **necessarily** become more vulnerable. Rather, the **point is** solely that the public policy debate has gone forward as though the system has become more vulnerable. In fact, the key focus of this paper **is** on the assumptions that **implicitly** underly many current **financial** reform proposals, and it is argued that they do not capture adequately the present **financial** system

in the portfolios of many of the major **U.S.** money center **banks**.<sup>4</sup> Additionally, the rapid growth of large dollar payments and expanded daylight overdraft activity increase risks to the payments system and ultimately to the Federal Reserve. These problems, fueled by banking industry frustrations with the current regulatory structure, which many believe is outmoded in today's competitive environment, and the perceived competitive inequities resulting from differential regulation of competitors have become major sources of pressure for regulatory reform.<sup>5</sup>

Recent reform proposals have attempted to address these problems, and some of these proposals are discussed in detail by Thomas Huertas (1987). Most start with several explicit or implicit premises and propose fairly minor changes in the existing structure. It is argued that banks and financial intermediaries remain unique, that they continue to play a special role in our economy as providers of transaction services and as sources of liquidity, that government has a fundamental responsibility to assure the safety and soundness of financial markets, and implicitly, that it remains possible to keep our domestic financial system essentially insulated from international **markets**.<sup>6</sup> This paper examines some of these premises in more detail in the hopes of provoking discussion and reexamination of their current relevance to regulatory reform issues. In some instances, overexaggeration is employed to help point out the implications of where the financial system seems to be evolving. It is only by these exercises that a clearer

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<sup>4</sup> The rate of bank **failures** in 1987 is about at the 1986 rate, an **all-time high** except for the 1920s and 1930s. The recently **publicized writeoffs** of **third world debt** by most of the major money center banks and their **posting** of large second quarter losses are **viewed** as another symptom of the problems of **vulnerability** of the financial system. Losses for the second quarter of 1987 are **estimated** to be over \$10 **billion**. These losses are due to more than problems **in the foreign debt area**. **Institutions** are **reporting** problems **in their bond trading area**, **in nonperforming loans**, and **with rising expenses**. See Schmitt and Hill (1987).

<sup>5</sup> As early as the Hunt Commission (1971) problems **with the existing** regulatory structure were **being extensively** explored and **comprehensive, forward-looking** reform proposals were suggested, but the **commission's** recommendations were never **given very serious consideration**. Subsequent **studies**, such as the House's FINE report, were followed by **similar inaction**. **Meanwhile**, market forces were **significantly shaping** the **evolution** of the system. Piecemeal legislation has been enacted, most notably the Monetary Control Act of 1980 and the **Garn-St Germain** Act of 1982, which largely **ratified** these market developments.

<sup>6</sup> See, for example, Comgan (1986).

understanding can be gained of the implications of specific reform proposals.

The paper will first briefly examine the services that banks provide and the market imperfections that they address. Next, recent changes in the **financial** system and how they are eroding market imperfections are examined. Then the public interest in banking and the payments system will be examined in light of these changes.

It will be argued, first, that market developments are eroding the market imperfections that gave commercial banks their advantages over direct credit markets. Moreover, bank liabilities no longer perform their same unique functions in the nation's payments system. Therefore, any forward looking reform proposals must take these developments into account. Second, because of internationalization of the U.S. financial system and the ability of U.S. institutions to engage in structural arbitrage, one can no longer ignore the international considerations in the design of new reform proposals. It is no longer possible to constrain our domestic institutions through regulation without (1) creating opportunities for foreign institutions to achieve a competitive advantage in our domestic markets, (2) providing incentives for the domestic customers to seek lower cost alternatives abroad, and (3) driving our domestic financial institutions abroad, where they may be less constrained. Third, concerns for maintaining the safety and soundness of the payments system differ significantly from those that were relevant when the present regulatory structure was put in place. The existing structure was designed to protect the stock of money, and this was to be accomplished by preventing the failure of commercial banks whose liabilities were the primary component of the money stock. Today, the primary concern is assuring the integrity of the flow of payments through the payments system as financial assets are exchanged. Finally, if they are to be successful, forward looking reform proposals must take into account not only the existing financial and regulatory structure but also how the regulated institutions will respond to changes in regulations and regulatory burdens.

## **Market imperfections and financial intermediaries**

In a world with perfect markets and no transactions costs, there

would be no need for financial intermediaries or depository institutions. Assets would be perfectly divisible, and agents could costlessly seek out and exchange assets they held or services they provided for those that they needed. It is only when market imperfections, such as indivisibilities of assets, transactions costs, and asymmetric and costly information are recognized that the existence of financial intermediaries can be explained. Conversely, as these imperfections are reduced, transformed, or modified by changing market conditions and new technological developments, the economic advantages for certain financial intermediaries are modified.<sup>7</sup>

Contemporary finance theorists have identified a number of services that depository institutions **provide**:<sup>8</sup>

1) Portfolio management services. At low cost, holders of claims on financial intermediaries can acquire an interest in a diversified portfolio of claims on deficit spending units that they could not acquire in their own portfolios because of indivisibilities and transactions and monitoring costs.

2) Payments services. In the case of certain intermediaries (banks, thrifts, and others), they facilitate the transferring of ownership claims on assets among individuals by debiting and crediting the accounts of the intermediary. Here there are economies of scale in accounting, record keeping, and processing, and in the clearing and settlement of payments.

3) Risk sharing services. As an important and conceptually separable component of portfolio management services, financial intermediaries facilitate the distribution of risky income flows from the asset portfolio. Debt holders typically receive fixed payments or variable payments, and equity holders receive the residual. A whole class of insurance services are also included under the heading of risk sharing services. These would

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<sup>7</sup> In his comment on this paper, Kane (1987) properly points out (1) that regulation can create market imperfections—though **restricting** **arbitrage possibilities**—Kane (1981) and (2) that government **subsidies** can be important as **regulation** in affecting the **viability** of **institutions**. It was beyond the scope of **this** paper to **revisit** the effect that government regulation and **subsidies** have had on **financial** structure. See, for example, Kane (1981) or Eisenbeis (1985). It remains the case, however, that the literature on the theory of the **banking** firm does not rely on the **existence** of government regulation or **subsidies** to explain the existence of **financial institutions**. Nevertheless, the point **is** well taken.

<sup>8</sup> See, for example, Fama (1980), Black (1970), Hall (1982), and Balternsperger and Dermine (1987).

include standard options contracts to withdraw deposits upon demand (liquidity services) as well as other options and **contingent** claim contracts (such as letters of credit and standby letters of credit), and exchanging fixed for variable or variable for fixed claims (including interest rate swaps). These insurance services rest on indivisibilities as well as economies in credit evaluation and access to costly information.

4) Monitoring services. Financial intermediaries also assess credit risk and monitor the payment performance on assets in the portfolio. Financial intermediaries can address the problems of devising and pricing financial contracts when there is both public and private (**asymmetric**) information and monitoring is costly. Borrowers may deal with intermediaries and reveal private information that the intermediary will not divulge to the public and, in turn, will monitor performance for the intermediary's investors and **creditors**.<sup>9</sup>

If institutions just provided portfolio diversification and payments services, there would be no need to regulate banks or financial intermediaries.<sup>10</sup> Banks would not be special; they would essentially function as mutual funds whose assets would be marked to market on a continual basis. Shareholders would receive the market rate of return adjusted for risk and a management **fee**.<sup>11</sup> It is the insurance functions, and in particular the liquidity services of redeeming claims at par upon demand or very short notice, that make banks special when compared with other financial intermediaries and raise the question of whether there is a public interest in regulating banking organizations. Recent developments in financial markets, however, raise serious questions about how "special" banks are in providing insurance, liquidity, and transactions services anymore. These are discussed in the next section.

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<sup>9</sup> The role of intermediaries when there is costly monitoring and private information has been an active area of recent research in the finance literature. See Jacklin (1984), Diamond (1984, 1986)

<sup>10</sup> See Fama (1980) and Black (1970).

<sup>11</sup> See Baltensperger and Dermine (1987).

## Recent developments in financial markets

The pace of change since the early 1980s has, if anything, accelerated. Two recent developments have been particularly noteworthy and represent important breakdowns in market imperfections that have historically provided the rationale for the existence of financial **intermediaries**.<sup>12 13</sup> These are (1) the explosive growth of asset securitization and contingent claims and (2) the internationalization of financial markets.

Developments in the application of options and asset pricing theory, securitization, and the growth of contingent claims and guarantees have led to an unbundling of the services traditionally provided by depository intermediaries into their component parts. These elementary services can be provided economically and often at lower cost. For example, stripping coupons from bonds segments the interest stream from the principal, creating a zero coupon bond, and changes the interest rate and price risk characteristics of the security. The spread of pass-through securities has resulted in a segmentation of the origination, credit evaluation, and pricing of credit risk from the credit intermediation function. Standby letters of credit have become pure insurance contracts enabling banks to continue their credit risk and assessment functions without having to fund the transaction. Interest rate futures contracts segment the interest rate risk component from the other components of a financial transaction, allowing institutions and individuals to hedge or to speculate on interest rate movements. The growth of foreign exchange options and the introduction of consumer exchange warrants (**CEW's**) enable corporations and individuals to take an interest in foreign exchange movements without having to take positions in the currencies themselves.<sup>14</sup> Finally, because of the growth in asset securitization, heretofore **non-traded** or illiquid assets can be valued, and most importantly, whole new securities can be created that divide up the long-term **immedi-**

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<sup>12</sup> For **discussions** of Imperfect markets models of **banking**, see **Pringle (1972)**, **Klein (1971)**, and the review paper of **Santomero (1984)**

<sup>13</sup> For **discussions** of the process and history of **financial** change and innovatton, see **Eisenbeis (1986)** and **Kane (1981)**.

<sup>14</sup> See **Forde (1987)**.

ate-term, and short-term credit and intermediation risks associated with longer-term securities. In short, the kinds of instruments being traded in financial markets have changed radically. These new instruments perform functions essentially similar to those provided by traditional intermediaries. Banks and thrifts, for example, traditionally have provided both maturity intermediation and denomination intermediation services. These new asset securitization techniques provide a way, through the creation of derivative securities, to perform these same functions. Short, intermediate, and long securities can be issued against a pool of long-term assets, such as mortgages, that can be tailored to meet the investment and maturity preferences of individual and institutional investors. Instead of having to hold the liabilities of a financial intermediary to obtain desired maturities and diversification benefits, derivative securities can be held.

One important development following from the spread of securitization is the potential decline in demand for the services provided by traditional depository financial intermediaries. High-quality credits will be increasingly attractive to creators of derivative securities and the lower rates will compete away these high-quality credits, which had traditionally been the major sources of business for banks. Moreover, the design, underwriting, and distribution of securitized assets is not an activity that banks have traditionally engaged in because of Glass-Steagall restrictions on securities activities. Faced with an erosion of their traditional borrowers, banks have sought to engage in securities activities through their bank holding company subsidiaries or abroad.<sup>15</sup>

This move by borrowers and lenders from the indirect to direct credit markets, driven by cost savings estimated to be on the order of 140 basis points, has already happened in the corporate credit market.<sup>16</sup> Large, high-quality corporate borrowers now rely significantly on access to the U.S. domestic and Eurocommercial paper market for short-term funds. Commercial paper has grown from \$200 million in 1983 to \$320 million in 1986. Longer-term funds are

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<sup>15</sup> See Kaufman (1985, 1987) or Eisenbeis (1987) for descriptions of the securities activities of banking organizations.

<sup>16</sup> Rose (1987).

obtained in the long-term debt and Eurobond markets. Eurobond issues, for example, have grown 33 percent since 1980.<sup>17</sup>

High-quality middle-market corporate customers are also benefiting from the growth of direct credit market alternatives. Junk bond financing doubled in 1986 and the use of credit enhancements in the form of standby letters of credit and other types of guarantees have increased the acceptability of less known borrowers to investors.

As a result of these developments, there has been a shift in the institutions who are participating in these markets away from traditional intermediaries towards securities firms and investment bankers skilled in the creation, design, and distribution of these new derivative securities. Investment bankers, in particular, are increasingly providing not only advice and aid in the structuring and distribution of financial instruments, but they also are providing a significant credit function in connection with their underwriting activities. In addition, mutual funds and pension funds have become attractive to individuals that would otherwise hold liabilities of financial intermediaries, and as part of the diversification services they provide, these institutions have become important sources of funds to business.<sup>18</sup> Today, other financial service firms are almost as important as banks and thrifts holding about 45 percent of the total private financial assets held by financial service firms.<sup>19</sup>

The end results of this process of **financial** change are a further breakdown of some of the traditional market imperfections that have segmented financial markets and given financial intermediaries a competitive advantage. The increased substitutability among financial assets reduces the need for corporations and individuals to hold bank liabilities for precautionary and store-of-value purposes. The reduction in market imperfections and the increased incentives and willingness of individuals and corporations to hold financial assets other than bank liabilities furthers the trend toward disintermediation as

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<sup>17</sup> Data source, Rose (1987).

<sup>18</sup> Rose (1987) reports that of the \$918 billion of bank time and savings deposits and mutual fund shares, mutual funds held 15 percent. By 1986, mutual funds were estimated to hold 36 percent of the total of bank time and savings deposits and mutual fund shares, which had increased to \$1.93 billion.

<sup>19</sup> Data date 1983, source *Blueprint for Reform: The Report of the Task Group on Regulation of Financial Services*, 1984.

borrowing and lending activities move increasingly from the indirect to direct credit markets.

The second development has been the internationalization and integration of financial markets as both borrowers and lenders increasingly are able to obtain funding or engage in transactions across borders. U.S. financial institutions now have significant presence abroad. This includes not only banking offices but also merchant banking, dealing and underwriting debt and equities, underwriting and brokering life insurance, management consulting, and brokering real estate. U.S. banks were lead managers in from 12 to 15 percent of the Eurobond underwritings in 1985.<sup>20</sup> U.S. firms also have significant nondomestic options for raising funds. These include not only the ability to borrow from the U.S. office of foreign banks or from foreign banks abroad, in London, Tokyo, Germany, or Switzerland. Similarly, U.S. and non-U.S. firms are bypassing financial intermediaries and accessing credit and other financial service markets directly.<sup>21</sup> U.S. companies are issuing both stock and bonds in foreign markets, often at costs below those in domestic markets.<sup>22</sup> The result is increased integration of domestic and foreign markets from both the borrower and lender sides of the market. The prices and availability of funds in U.S. markets are no longer insulated from those prevailing in the rest of the world as both borrowers and lenders arbitrage spreads and terms as the opportunities arise. This integration also means that regulatory policies designed to restrict the activities of either borrowers or lenders in domestic markets can be easily avoided by shifting financial activities to nondomestic markets. Moreover, as the costs (both information and transactions) of these avoidance activities decline, the more the international activities of U.S. corporations and financial institutions expand.

A number of forces have contributed to this internationalization of U.S. markets. Freer trade flows have opened up opportunities for companies generally. The reduction in regulatory barriers has opened

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<sup>20</sup> See Board Staff (1986) for this and other measures of the foreign activities of US banking organizations.

<sup>21</sup> Kodak Corporation, for example, even has their own foreign exchange trading operation with a trading desk in Rochester, New York

<sup>22</sup> Even major regional U.S. banks are turning to foreign markets to raise equity. NCNB Corporation's stock is now traded in Tokyo.

up foreign markets to international banking **organizations**.<sup>23</sup> Foreign banks, for example, have expanded significantly in the United States and have widened the scale of their dealings with U.S. domestic **customers**.<sup>24</sup> As of 1986, there were more than 250 foreign banking organizations that had a presence in U.S. financial markets, and these firms had aggregate resources of \$500 **billion**.<sup>25</sup> These institutions know many more U.S. borrowers than previously, and by virtue of their parent companies' positions in their home country markets, they are able to assist in flotation of the securities of U.S. firms abroad. Moreover, many are able to offer a wider array of securities and other financial services precluded to U.S. banks by regulation. These advantages are probably significant in explaining why foreign banks now account for about 20 percent of the commercial and industrial loans to companies with U.S. addresses.<sup>26</sup> Similarly, U.S. banking organizations help foreign companies issue securities in U.S. and foreign markets. This latter activity has been facilitated by the recent opening of foreign securities markets to U.S. banking organizations. The 1986 Financial Services Bill, so called Big Bang in the United Kingdom, for example, opened the London market more to U.S. banking organizations and provided for an integration of securities underwriting, distribution, and investment within banking conglomerate~. As already suggested, the availability, access, and free flow of information, has made it easier for lenders to assess the risks of dealing with offshore borrowers.

Internationalization has made it increasingly difficult for individual countries to maintain regulatory structures or regulations different from those in the rest of the world. There are two reasons for this. The first is the ease with which financial institutions, through **financial** innovation, can avoid the regulatory restrictions of individual

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23 See Kane (1986) for a description of how regulatory barriers to raise equity.

24 Even in the late 1970s, foreign banks were important sources of funds to corporations. In some months, foreign banks accounted for over 60 percent of the credit supplied to major corporations in New York.

25 Comgan (1987).

26 Comgan (1987).

27 Another U.K. bill will permit thrift institutions to compete more freely with banks, including the making of personal and corporate loans, the offering of insurance, and equity participations.

**countries.**<sup>28</sup> The second is that regulatory avoidance is encouraged by regulatory bodies in individual countries that seek, by providing accommodating regulatory climates, to attract and expand the institutions doing business in their country. Kane (1986) has described the nature of this international structural arbitrage, and the inescapable conclusion is that it has now become extremely difficult—if not impossible, to pursue domestic regulatory policies without the cooperation of foreign regulators. For example, the U.S. regulatory agencies recently published for comment capital adequacy standards to be applicable to banks in the United Kingdom and the United States. Peter Cooke, Associate Director of the Bank of England, recently indicated that he had begun work to bring the Japanese into the arrangement as well to ensure competitive equality among the major competitors in financial markets.<sup>29</sup>

These developments are having far reaching consequences for the competitive viability of certain institutions and are also raising concerns about potential risks in financial markets. For example, increased securitization of assets has given an advantage to those institutions adept at designing contracts and distributing securities and derivative instruments. Traditional lenders have seen the erosion of their markets and disappearance of many of their low-risk customers as technological and market changes eliminate or significantly reduce market imperfections that provided economic opportunities for financial intermediaries. In this environment, it seems increasingly clear that banks are no longer unique and that the role they play in the financial system has changed significantly.

## The uniqueness of banks

Similar to what finance theory suggests, the regulation of banking and the rationale for restricting banking activity hinges on the supposedly special role that banks play in the financial system.<sup>30</sup> A well-

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<sup>28</sup> See, for example, Kane (1981) or Eisenbeis (1986).

<sup>29</sup> Cooke (1987).

<sup>30</sup> For discussions of the history and forms of the regulation of banking, see Huertas (1983) and Benston (1983)

functioning financial system enhances the efficiency of producing goods and services, thereby expanding **the** wealth and income of society. Financial market instability reduces income and can result in recessions and economic depressions. The supposed externalities associated with cumulative bank failures have provided the rationale for public intervention.<sup>31</sup> The traditional arguments that banks are special rest on (1) the role that banks play as sources of liquidity, (2) the importance of bank liabilities as money, and (3) the inherent liquidity problem banks face **because certain** bank liabilities are redeemable at par on very short notice or upon demand whereas their liabilities are **not**.<sup>32 33</sup> These roles are briefly evaluated below.

### *Bank liabilities as money*

In the early history of this country, individual banks issued their own bank notes to the public promising to redeem the notes at par for specie. At their peak, the notes of over 6,000 banks were in circulation. When given in exchange for goods or services, not all notes were equally valuable to the public, and for this reason, it was not uncommon for notes issued by out-of-area banks to trade at discounts, despite the fact that they, were supposedly redeemable at par for **specie**.<sup>34</sup> These discounts reflected several factors, including transportation costs for both notes and specie, transaction costs, lack of information on the issuing bank, and uncertainties about the credit-worthiness of the issuing bank.

While lack of par clearance in no way affected the ability of state bank notes to function as money, it did result in many inefficiencies. Exchange rates among notes had to be established, prices of goods had to be adjusted to reflect these rates, and real resources

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<sup>31</sup> For a summary of the arguments, see Aharony and Swary (1983).

<sup>32</sup> Comgan (1986) indicates that a large modern economy requires the existence of an asset that is both highly liquid and readily transferable at par. This asset has been provided by currency and bank demand deposits.

<sup>33</sup> See Benston and Kaufman (1987)

<sup>34</sup> Under the Suffolk system that was in place in the Boston area during the 1800s, state bank notes did trade at par. This par clearance was the result of competitive market forces and fundamental economic incentives.

had to be used to arbitrage exchange rates in the process of returning notes to the issuing bank when they were presented for payment.

Since note issues typically were not backed 100 percent by gold or silver reserves, periodic liquidity problems arose when note holders became concerned that a bank might not be able to honor its redemption commitment. Runs on individual banks and the system sometimes occurred, and these resulted, albeit infrequently, in cumulative contractions in the money supply. Loss of a dollar of specie meant loss of the ability to support several dollars of notes **outstanding**.<sup>35</sup> <sup>36</sup> Suspension of convertibility was a common way for early banks to deal with temporary liquidity **problems**.<sup>37</sup> This prevented a cumulative decline in the volume of an individual bank's notes outstanding and prevented failure but often resulted in a substantial loss of purchasing power as the discounts on notes of banks that had suspended convertibility often increased substantially. This decline in purchasing power shifted the cost of nonconvertibility, at least temporarily, to the creditors (depositors) of the bank, giving all liability holders an important incentive to worry about bank solvency. Indeed, Kaufman (1986) notes that bank capital ratios during this period were substantially higher than they were subsequent to introduction of federal deposit insurance.<sup>38</sup>

For these early banks, avoidance of runs meant maintenance of public confidence that the institution could convert notes into specie in sufficient amounts to avoid the need to suspend convertibility. Indeed, the first forms of public regulation to deal with the problems of suspension of convertibility were the imposition of reserve requirements specifying permissible ratios of notes to specie. Maintenance of public confidence was assured by engaging in minimal maturity intermediation, maintaining sufficient specie reserves, and having adequate capital and liquidity. Most commercial banks tended to make

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<sup>35</sup> For a discussion of bank runs, see Kaufman (1986) and Bryant (1980)

<sup>36</sup> Kaufman (1986) maintains that these runs were not nearly as costly as sometimes has been alleged.

<sup>37</sup> Clearing houses and other banks in the region also provided temporary credit to institutions experiencing liquidity problems. See Kaufman (1986) and Kaufman and Benston (1987).

<sup>38</sup> Peltzman (1970) had long argued that banks tended to substitute deposit insurance for capital

short-term loans, which were predictably and periodically repaid in either specie or **notes**.<sup>39</sup>

The creation of the national **banking** system in 1864 and the imposition of a tax of 10 percent on the issuance of notes by individual state-chartered banks in 1865 finally drove state bank notes out of **existence**.<sup>40</sup> State banks, however, remained viable and prospered because demand deposits, and not currency, had become the principal bank financial liability that was traded and used in making transactions. Just as with state bank notes, not all checks cleared at par, yet these liabilities were accepted and were readily used as a medium of exchange. It was not until the Federal Reserve Act of 1913 that all member banks were required to clear checks at par.

Thus, contrary to the assertions of some authors, par clearance was never a necessity as far as the public was concerned for bank liabilities (either bank notes or bank deposits) to serve as **money**.<sup>41 42</sup> Rather, the key attributes are related to value determination and acceptability, attributes that are becoming increasingly important today for the liabilities of other financial intermediaries.

### *Liquidity considerations, safety and soundness, and bank runs*

With the advent of demand **deposits** as the principal component

<sup>39</sup> These early banks, did make longer term loans and did not, however, cling to an extreme form of the Real Bills Doctrine in **conditioning their lending** behavior, as some authors have suggested. See Klebener (1974)

<sup>40</sup> **Creation** of the national **banking** system was motivated in large measure, as were many previous **financial** reforms, by the need to finance a war. The **issuance** of a national currency backed by federal debt was an indirect way of **financing** the Civil War through inflation.

<sup>41</sup> Corngan **mistakenly** argues that to **function** as money, bank **liabilities** must be redeemable at par. **U.S. financial history** is filled with examples of bank **liabilities** that **functioned** as money but were not redeemable at par. **During** the early **1800s**, state bank notes circulated as money but were not always redeemable or convertible at par. In fact, there was a whole industry that consisted of publishing **information** on the notes of banks and on **making** markets in the notes of **individual** banks, some of **which** would be converted at par and others at discounts. To be sure, par conversion or **acceptability** is more **efficient** but is certainly not crucial for bank **liabilities** to serve as money. Moreover, **inefficiencies** decline as **transactions** and **information** cost declines.

<sup>42</sup> To be sure, **there** were periods, such as the experience in New England with the Suffolk system, when notes cleared at par. See Robertson (1964) or **Redlich** (1966). There **is** also no denying that par clearance reduces the problems of determining exchange rates, **eliminates** **circumtous** routing, and reduces the use of **private** real resources in operating the payments system.

in the money supply, liquidity concerns changed from focus on specie convertibility to the ability to meet demands for withdrawals of currency or payments of checks to other banks. This was accomplished by maintaining sufficient volumes of reserve balances, demand notes, government securities, or other marketable assets in a bank's portfolio.

In the case of national banks before passage of the Federal Reserve Act, legal reserves included not only cash in vault but also deposits at reserve city and central reserve city banks. Permitting balances held at other banks to count as legal reserves resulted in a pyramiding of reserve assets' within the banking system. It constituted a major structural flaw in the national banking system, and, as later history demonstrated, was a major source of financial instability. A run or unanticipated demand for funds by a rural national bank created a call on interbank reserve deposits. If the reserve city bank did not have access to sufficient funds to meet the withdrawal of interbank deposits, then loans had to be called or assets sold. **When** assets were liquidated, the result was a cumulative decline in bank loans and deposits outstanding in the **system**.<sup>43</sup> Thus, with the pyramiding of reserves, it was easier for a run on an individual bank to have systemic systemwide effects.<sup>44</sup>

An important attribute of the early runs is that they were usually flights to **currency**.<sup>45</sup> Depositors lost confidence in the ability of the institution to make good on its commitments to redeem deposits so they attempted to convert their deposits into currency before the bank

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<sup>43</sup> After creation of the Federal Reserve System, **imposition** of member bank reserve requirements were employed as a monetary policy instrument. Numerous research has argued that reserve requirements are not necessary for effective **implementation** of monetary policy. See, for example, **Fama (1983)**, Wallace (1981, **1983**), Bryant and Wallace (**1984**), Kareken (**1984**), and Baltensperger and **Dermine (1987)**. The argument is that as long as banks voluntarily hold reserves in the form of currency or base money for **precautionary** and **liquidity** purposes, due to transaction costs **and** because bank deposits are not risk free, **as long as** the government has a monopoly in the creation of currency and base money, then the monetary authority can **effectively** implement monetary policy. The **import** of **this** work and the lack of evidence that **deregulation** has had substantial **macroeconomic** effects, **is** that monetary control **considerations** should not play an important role in affecting the structure of the **regulation** of the **financial** system. See Baltensperger (**1982**), Santomero and **Siegel (1985)**, and Baltensperger and Dermine (1987)

<sup>44</sup> According to Kaufman (**1986**), however, the **economic** consequences of these runs have been overestimated for **a** was common for **private** arrangements through individual banks and **clearing** houses to **provide** emergency **liquidity** to **economically** solvent **institutions** in need of temporary help.

<sup>45</sup> See Kaufman (1986).

became insolvent. Such runs withdrew base money from the system and contributed to a cumulative collapse of the money supply as banks loans were called in or assets sold, often at panic or "fire sale prices."

Creation of the Federal Reserve System dealt with the fundamental instability of the fractional **reserve** system in two principal ways. The **1913** act eliminated the use of interbank deposits as legal reserves and substituted deposits held at the Federal Reserve. Additionally, the Federal Reserve was to serve as a temporary source of liquidity by providing emergency credit through the discounting of eligible collateral. In this way, institutions could avoid technical insolvency that resulted from having to sell otherwise good assets in markets at distressed (fire sale) prices due to a temporary glut on the market and the high costs of quickly seeking out buyers. Unfortunately, during the Depression, the Federal Reserve failed to provide the needed liquidity, and it is estimated that the money supply collapsed by as much as one **third**.<sup>46</sup>

The failure of the Federal Reserve to provide adequate reserves during the Depression contributed to the institution of **federal deposit insurance**.<sup>47</sup> Deposit insurance effectively made bank failures independent events by breaking the link between the value of a bank's assets and the ability of insured depositors to obtain their funds when a bank's net worth became negative. Insured depositors had no reason to be concerned about their ability to receive their deposits regardless of the value of the bank's assets or the value of the assets of any other bank in the financial system. Implementation of the failure resolution provisions of the Federal Deposit Insurance Act has resulted in *de facto* **100** percent insurance for depositors for most of the period since **1933**. Since most bank failures were resolved by a purchase and assumption transactions, the acquiring bank assumed both the insured and uninsured deposits of the failed bank, which reduced the potential costs of failure to uninsured creditors significantly. It has only been recently that there have been limited attempts to avoid *de facto* **100** percent insurance **through** the use of limited payouts, *etc.*<sup>48</sup>

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<sup>46</sup> See Friedman and Schwartz (1963).

<sup>47</sup> Friedman and Schwartz (1963) regard federal deposit insurance the single most important reform of the 1930s

<sup>48</sup> See Kane (1986) for a discussion.

It is important to digress for a moment to discuss more precisely what is meant by "confidence" as it pertains to bank runs because the concept has sometimes been abused. Confidence is not a subjective or ephemeral concept. It does **not** relate to the management or to intangible attributes of the firm. Rather the role of confidence is most easily understood if related to depositors' assessment of the market value of the institution's assets relative to its liabilities. As long as the market value of the institution's net worth (including the value of any conjectural guarantees) is positive, then there is no need for a depositor to be concerned about being able to redeem his deposits for currency. With negative net worth, it makes perfect sense for uninsured creditors to attempt to obtain their funds, because some creditors in line will not be paid. Thus, the way for an institution to establish (or to reaffirm) confidence is to reveal to existing as well as potential depositors and other uninsured creditors the true quality (market value) of its assets. Convincing the market that it had a positive market value net worth is precisely what Continental Illinois and most of the state-sponsored-insured **S&L's** in Ohio were, in the end, unable to do precisely because they were insolvent, but what Manufactures Hanover was able to do. It is also important to note that the runs in the Continental Illinois situation and in the Ohio **S&L** situation were not runs on the financial system or flights to currency. Funds withdrawn were redeposited at other institutions that did have positive market value net worth. In the case of the **S&L** crisis in Ohio, funds were withdrawn from institutions insured by the state-sponsored fund and deposited in federally insured banks and thrifts. These withdrawals took place because depositors perceived the **state-sponsored** fund to be underfunded and the state demonstrated that it was unwilling to provide adequate funding after the crisis began. The public also demonstrated its ability to distinguish between solvent and insolvent institutions insured by the state-sponsored fund. Not all experienced runs, and there is no evidence of runs on federally insured institutions. In fact, one noninsured institution remained open throughout the crisis. It is this link between the market value of a depository institution's net worth and public confidence that has led some reformers to argue strenuously for market value reporting for depository institutions.<sup>49</sup>

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<sup>49</sup> See Benston, Eisenbeis, Horvitz, Kane, and Kaufman (1986).

Runs to currency are less likely today than in the past.<sup>50</sup> Currency runs are impractical for large dollar depositors. Withdrawing tens or hundreds of millions of dollars in cash from a large U.S. bank would be physically impossible. The volumes of currency would not be readily available, even from the Federal Reserve, and transportation and storage would be difficult and costly. Most small dollar depositors' accounts are insured, so there is no need to engage in a currency run. In fact, despite the fears of the Federal Reserve that failure of Continental Illinois would cause creditors, especially foreign creditors to lose confidence in the entire system or significant components thereof, this is a very unlikely event.<sup>51</sup> <sup>52</sup> First, federal deposit insurance, as it has been implemented, has broken the link among institutions, making failures independent events.<sup>53</sup> **Second**, it is less costly and much easier to demonstrate solvency to the public than it was during the Depression. We now have public disclosure requirements, and income and balance sheet information on individual institutions are now readily and publicly available.<sup>54</sup> Rating firms now monitor continuously and rate the CD's and debt of many banks and thrifts. In addition, with the rise of passthrough securities and securitization in general, it is becoming easier to price heretofore hard to value assets on bank balance sheets. Finally, with the advent of modern communications, dissemination of the relevant information

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<sup>50</sup> Kaufman (1986) provides a useful discussion of the historical evidence pertaining to bank runs

<sup>51</sup> It is remarkable that there has not been a major run on S&L's. The vast majority of them are insolvent, as is the FSLIC. The main element preventing such a run is public confidence that the U.S. government will make good on its commitment to insure the deposits in failed institutions. The important feature of the present situation in the S&L industry is the importance of considering the value of the guarantees when determining solvency (in this case, solvency of the FSLIC)

<sup>52</sup> Meltzer (1986) argues that the methods the Federal Reserve used in the Continental Illinois case actually increased the risk of loss of public confidence. The failure of the Federal Reserve to provide emergency credit itself and instead putting together a group of U.S. banks to provide credit to Continental Illinois signaled to the market concerns by the Federal Reserve about the quality of Continental Illinois' assets.

<sup>53</sup> For arguments for reducing insurance coverage, see Kane (1986) or Benston, Eisenbeis, Horvitz, Kane, and Kaufman (1986).

<sup>54</sup> Before the early 1970s, only an abbreviated balance sheet was required to be disclosed and non income and expense reports were public information

is easier and less costly. A welcome and needed addition would be the ready availability of market value accounting data.

Deposit insurance was put in place in part as a response to the failure of the Federal Reserve to **liquify** sufficient assets of banks during the Depression. It was specifically structured to protect the wealth of small depositors by protecting them from loss of their deposits when a bank failed. Similar protection was afforded the wealth holdings of small depositors in **S&L's**. The problems of the present structure of the federal deposit insurance system and the risk-inducing elements associated with the flat-rate premium structure as net worth goes to zero has been well described elsewhere and will not be discussed **here**.<sup>55</sup> However, it is important to reconsider the structure and function of deposit insurance in a world where numerous financial liabilities other than those issued by banks and thrifts can serve the same money function as bank liabilities, where most abodes of purchasing power are held in the form of liquid financial assets other than demand deposits, and where insured transactions accounts may only have nonzero balances in the process of liquidating a financial asset to make a transaction.

These issues arise because the payments system and medium of exchange have changed significantly since the Federal Reserve was created and deposit insurance put in place. Protecting the payments system no longer means protecting the money supply or protecting competitors because of fundamental changes that have occurred in the way payments are made and in what constitutes the money supply. Each of these will be considered in turn.

### *Reductions in market imperfections and changes in money and the way payments are made*

As has already been suggested, financial innovations have changed significantly both the instruments and the way payments are typically made. Moreover, the institutions whose liabilities now are important elements in the payments system have expanded significantly, and, hence, the liabilities that serve the function of money have

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<sup>55</sup> See Kane (1986) or Benston, Eisenbeis, Horvitz, Kane, and Kaufman (1986).

increased.<sup>56</sup> Checks are routinely written on savings (NOW) accounts at both banks and S&L's, S&L's and mutual savings banks offer checking accounts, and credit unions offer share drafts. Checks are also written on cash management accounts at brokerage houses and on money market mutual funds, accounts that are marked to market each day. Debit cards are the technological equivalent of a check. Through the use of computer technology, the debit card reduces float for the issuing institution, which now must be paid for if the Federal Reserve paper check clearing services are used. These cards, when used in an electronic payments system, authorize the withdrawal of specified amounts and payment to a second party by electronically drawing down one account and debiting another, at the same or different institutions. Finally automatic transfers and automated clearing house (ACH) transactions are being used for predictable and large volume payments, such as social security payments, dividend payments, etc.

Less attention has been given to credit card transactions that now play an important role in the payments system as far as individuals are concerned. Credit card transactions are orders to pay that are made at less than par by an intermediary which then collects from the drawer at a later time. Merchants, at whose store transactions are initiated, agree to accept a discount, historically averaging about 5 percent, in exchange for clearing and settlement (the price of the transaction is presumably imbedded in the cost of the good.) The merchant receives immediately available funds and credit is extended by the intermediary to the drawer until settlement is made. Rather than settling each transaction (as is done with a check) the settlement between the drawer and the intermediary is done usually once a month. Credit card transactions function as a broadbased payments medium that needs little or no reliance upon traditional transactions balances. The drawer pays for the credit extension by writing a check on a transaction account or liquidation of some other financial asset. The merchant receives a credit from the bank in the form of an increase in a transaction account, which is presumably converted im-

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<sup>56</sup> There is, of course, voluminous literature on the demand for money and the effects of financial innovation on monetary control, but coverage here is beyond the scope of this paper. For references, see Tobin (1983), Lindsey (1977), Kareken (1984), and Santomero and Siegel (1985).

mediately into an interest earning financial asset. Note too, that while there is nonpar clearance, only one party to the transaction need be aware of it.<sup>57</sup> Similar to credit card transactions are travel and entertainment card transactions, where payment of the entire outstanding balance is required each payment period. This use of credit substitute transactions mediums enable individuals to economize on traditional transactions balances and, in fact, can finance transactions through instantly approved credit if sufficient funds are not on hand.<sup>58</sup> The distinctions between credit transactions and regular demand deposit transactions have become blurred because of the use of automated credit evaluation systems and through the use of lines of credit that serve to reduce the costs of credit evaluation. This reduces the costs to consumers of making credit purchases versus check or cash purchases.

More important than these new close substitutes for demand deposit payments are methods that evolved to reduce the need for large dollar balance holders to hold funds in transaction accounts. A host of cash management devices, such as the use of zero balance accounts, deposit scanning, and lockbox arrangements, are employed to collect funds that would otherwise be held in the form of idle balances and channel them into instruments yielding a positive rate of return. When payments need to be made, these interest earning assets are liquidated, the proceeds temporarily deposited in a transaction account, and immediately disbursed over Fedwire or CHIPS. Upon receipt, funds are immediately converted into an interest bearing asset, even if it is only to earn interest overnight. Today, for most large dollar depositors and increasingly for small depositors as well, computers and the ease and reduced costs of converting interest bearing financial assets into demand deposits means that the traditional function of money balances as a source of liquidity is becoming less and less unique or important. A demand deposit is evolving into an account that at any particular instant in time has a zero balance. The account only has balances, as funds are swept into and out of the account

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<sup>57</sup> It used to be against the law for merchants to charge differential prices for cash versus credit transactions. That prohibition, however, has expired.

<sup>58</sup> These cards with their option to pay at the end of the month or to finance the transaction through an automatic extension of credit illustrate how fine the line is now between transaction accounts and credit

in the process of clearing and settlement for the brief time that it takes to make a transaction.

With the continued evolution of asset securitization and the development of easily divisible securities (i.e., mutual funds shares) and increasing use of computer technology, it is likely that more and more transactions will be taking place without even the temporary use of a transaction account. Once there is low cost convertibility of assets into easily valued securities or shares in mutual funds it is a small step to bypass traditional transaction accounts when assets are exchanged. Electronic financial barter and exchange of ownership of almost any financial are as easy, and involve fewer steps, than first converting the assets into funds in a transaction account and then exchanging ownership of a demand deposit. All that is needed is a message and switching system and a means to ensure that orders are carried out (settled).

In fact, the key attributes and **policy** issues associated with an electronic barter system are already in place with CHIPS and **Fedwire** and the methods used for large dollar transactions. It is the changes in the way that large dollar payments are made that has focused attention on payments system issues as part of regulatory reform proposals and these are discussed in the next **section**.<sup>59</sup>

### *Payments system changes*

When the Federal Reserve System was created and federal deposit insurance was put in place, most payments were made by checks drawn on demand deposits with the remainder made in currency. Demand deposits were the dominant bank liability and the source of funds to support lending activity. There were not close substitutes for bank liabilities or the functions they performed; nor were financial markets sufficiently deep that there were ready markets for the assets on bank balance sheets. Within that structure, protecting the payments system meant preventing the cumulative collapse of the money supply. And **since** the money supply consisted of currency

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<sup>59</sup> See Corrigan (1986).

and demand deposits, this meant that prevention of bank failures would prevent destruction of demand deposits.

Today, the payments system is larger, has many more components (both private and public), and is subject to different risks than in the past. The **check/demand** deposit system, which accounts for the bulk of individual payments except for currency, and the one that the present regulatory structure was primarily designed to protect, is in reality small in terms of the dollar volume of payments made today. While about 40 billion checks, amounting to about **\$36** trillion, are written on average each year, checks account for only about 12 percent of the nation's payments in terms of value **today**.<sup>60</sup> The rest are made in the form of computerized transfers of reserve balances on the Federal Reserve's **Fedwire** system and the privately owned CHIPS (Clearing House Interbank Payments System) system, and in the form of ACH transactions. Payments on the former two systems account for about 85 percent of the transactions made **today**.<sup>61</sup> Closely related to these systems are the automated transfers of book-entry Treasury securities that also take place on **Fedwire** and which involve substantial volumes of transactions.<sup>62</sup>

Transfers on the **Fedwire** system may be initiated by a bank on behalf of customers, but actually involve bank-to-bank transfers of balances held at Federal Reserve **banks**. These transactions are always very large, averaging \$2.5 million per transaction. Average daily volume amounts to about 200,000 transactions totaling **\$500 billion**.<sup>63</sup> About 99 percent of these transactions are computerized, originating on terminals or through computers at over 7,500 depository institutions directly connected to Federal Reserve computers.

Parallel to **Fedwire** is CHIPS. CHIPS is owned by the New York Clearing House and connects some 140 institutions, including 11 of the 12 members of the New York Clearing House, other U.S. commercial banks, about 80 branches and agencies of foreign banks, and numerous Edge Act **companies**.<sup>64</sup> CHIPS handles both domestic and

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<sup>60</sup> See Huertas (1986).

<sup>61</sup> See Huertas (1987).

<sup>62</sup> See Huertas (1987).

<sup>63</sup> See Mengle, Humphrey and Summers (1987).

<sup>64</sup> Although it is not a U S bank, American Express is a bank abroad and participates in CHIPS.

foreign payments and is the major clearing system for **dollar-denominated** international payments. Over 90 percent of the dollar payments between countries throughout the world take place on CHIPS. The volume of transactions on CHIPS is nearly as large as those on **Fedwire**. Average daily volume is \$425 billion for about 114,000 transactions. The average transaction size of more than \$3.75 million is even larger than on **Fedwire**. Similar to **Fedwire**, all CHIPS transfers are on-line electronic payments initiated by settling banks and sent directly to the CHIPS computer.

ACH transactions are also electronic transactions but, unlike CHIPS and **Fedwire**, are batch transactions with the payment information distributed prior to settlement. By and large, ACH transactions are small dollar transactions, such as social security benefits, dividend payments, etc., and volume remains quite small compared with CHIPS and **Fedwire**. During 1985, there were 283 million commercial ACH transactions totaling \$1.8 trillion (less than four days' transactions on **Fedwire**).<sup>65</sup>

The fourth giant element in the current payments system is the **book-entry** system for transferring government securities that also take place over **Fedwire**. The electronic transfer of ownership of paperless book-entry Treasury obligations are initiated by the seller of securities through the seller's bank. Securities are transferred from the seller's bank's account to the account of the buyer's bank, and payment involves a debit of the buyer's bank reserve account and a credit to the seller's bank's reserve account. About 300,000 such transfer per day took place during 1986, amounting to a daily average volume of \$260 billion. The average transaction size was \$8.7 million.

In the case of all of these payments systems; they consist of two components. The first is a notification and accounting element in which messages of orders to debit and credit certain accounts are routed electronically to the appropriate institutions. The second is the actual transfer of funds among institutions. For reasons of economy, funds are not transferred with each transaction. Rather, the electronic system keeps track of the net position each institution has with other participants, and only the net differences are "settled"

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<sup>65</sup> It was not until 1986 that private institutions through ACH's exceeded U S government transactions on the system

at the end of the day by transferring ownership of reserve balances held at the Federal Reserve.

### *Payments system risks*

The structure of these payments systems determine the risks they are subject to, who bears that risk, and how vulnerable the systems are to certain kinds of shocks. For example, in the case of **Fedwire**, once a payment is initiated and in the system, the receiving bank is guaranteed by the Federal Reserve that it will be delivered funds. That is, failure of the sending institution will not affect the receiving bank. Another convention of the system is that transactions result in immediately available funds for the receiving bank, but settlement by the sending bank with the Federal Reserve is at the end of the business day on a net basis, rather than on a transaction-by-transaction basis. In effect, the Federal Reserve interposes itself between the sending and receiving bank to guarantee the transaction. The **Federal Reserve** absorbs the credit risk (for a zero return) during the day that a sending institution will not be able to settle its net debit position at the end of the day.

Because of its structure, risks on **Fedwire** are mainly credit risks borne by the Federal Reserve and the participating **banks**.<sup>66</sup> These credit risks arise because of the way the settlement and clearing of transactions are structured. For the sending institution, there is the risk that the customer (which may be a corporate customer or a **financial** institution with an account at a clearing bank) requesting a payment to be made over **Fedwire** may not be able to cover the transaction. This risk is presently controlled through the establishment of customer overdraft limits that the clearing banks monitor on a real-time basis. The Federal Reserve has significant risk exposure due to the convention of providing immediately available funds to the receiving bank but not requiring settlement by the sending institution until the end of the business day. This policy encourages sending banks to make payments early, creating large daylight overdrafts to obtain free credit from the Federal Reserve and then to borrow

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<sup>66</sup> There is always the operations risks that would be associated with technical problems with the system.

Federal Funds or otherwise cover its net debit position just before the close of **business**.<sup>67</sup> Daylight overdrafts grew significantly during the **1980s**, and in many cases amounted to several times the invested capital of clearing banks. Daylight overdrafts averaged about \$40 billion per day on the **system**.<sup>68 69</sup>

For a long while, the Federal Reserve did little to control its exposure to daylight overdrafts. Now, however, two methods of risk control are used: ex post monitoring and the establishment of bilateral ceilings, or caps, for set maximum overdraft exposure for institutions. The Federal Reserve established its caps in March 1986, and unlike the normal situation where a lender does the credit evaluation and establishes limits for lines of credit, in the case of sender net debit caps, the Federal Reserve permitted the caps, established as multiples of the institution's capital, to be based on a yearly **self-evaluation** by the borrowing institution's board of **directors**.<sup>70</sup> Factors to be considered in establishing the caps are the institution's ability to control, monitor, and evaluate its daylight overdraft exposure, and an evaluation of its creditworthiness. As the result of continued concerns about the volume of daylight overdrafts, the Federal Reserve reduced the caps by 25 percent in July 1987.

As of June 1986, only three of the 12 Federal Reserve banks had automated capabilities to monitor exposure to daylight overdrafts on a real-time basis, and only financially distressed institutions are monitored on a real-time **basis**.<sup>71</sup> The alternative way for the **Federal Reserve** to control its risk would be not to allow any overdrafts in the system at all. This would require continuous monitoring, which has not yet been put fully into place. The arguments against not allowing overdrafts pertain to the supposed disruption to confidence that individual institutions would experience when payment orders were

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<sup>67</sup> The speed with which transactions are entered and processed have become increasingly important. Customers have recently complained about delays on Fedwire

<sup>68</sup> See Ireland (1986).

<sup>69</sup> More recent data reported by Kantrow (1987) indicate that "More than 1,000 banks routinely run a total of \$130 billion a day in funds transfer overdrafts . . ."

<sup>70</sup> A cynic might argue that this is similar to putting the fox in charge of the hen house.

<sup>71</sup> It was estimated that all 12 banks would have real-time monitoring capabilities by mid-1987. See Ireland (1986)

rejected.<sup>72</sup> This concern, however, would seem to be of little merit. First of all, institutions faced with the prospects of having payments rejected would have incentives to monitor and control their own risk exposure rather than seeking to take free credit from the system. This would introduce a desirable element of market discipline into the system. Second, there would be little instability introduced since there is no systemic risk on the system. Third, it would reduce the risks of the Federal Reserve, a particularly important concern, since many of the risks to which it is exposed arise from international transactions initiated by institutions outside of the Federal Reserve's regulatory jurisdiction. Finally, with automation of the clearing and settlement system and value dating of transactions, it would be a simple matter to establish a queue for payments from individual banks. Those with adequate clearing balances would have transactions that would clear more rapidly than those that did not, again adding an element of market discipline to the system.

Risks in ACH systems are essentially the same as the risks in a wire transfer system. Again, they arise because funds are usually made available to the receiving institution on the day of settlement, but funds are not actually paid until late in the settlement day. Unlike wire transfers, however, if an institution fails on the day of settlement before settlement actually has been made, ACH transactions will be reversed by the Federal Reserve. In such instances, the receiving bank is at risk as well, since funds advanced by the Federal Reserve on settlement day may be reversed. In the check system, the principle risks faced by the Federal Reserve are that the sending institution may not be able to settle and that the Federal Reserve will be left holding items to be returned to an institution that had failed.

The Federal Reserve's risks on the book-entry securities system are similar to those on Fedwire. In particular, if the receiving bank has insufficient funds at the end of the day to cover the securities purchased, the Federal Reserve is in the **position** of having to extend credit to the **bank**.<sup>73</sup> One difference between book-entry securities

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<sup>72</sup> See Ireland (1986).

<sup>73</sup> The extreme case where this happened was in November 1985 when the Bank of New York's computer system malfunctioned and the Federal Reserve made a \$22.6 billion dollar loan to the bank until the problems were fixed. Apparently, there were nontrivial problems in collateralizing that loan. Daylight overdrafts on government securities transactions run about \$55 to \$60 billion per day.

transfers and **Fedwire** payments is that in the former the Federal Reserve did transfer securities to the receiving bank and should have a security interest in the Treasury securities that had been purchased and transferred. As Ireland (1986) points out, however, perfecting that interest may not be straightforward since the party for whose account the securities may have been purchased also has an interest in the securities.<sup>74</sup> In addition, since it may not be clear what securities in the bank's own account the bank actually has a perfected security interest in, eligible collateral may not be readily available to use as security for a discount window loan. To date, although under current consideration, the Federal Reserve has not established caps for overdrafts in connection with **government** securities transfers to limit its risk exposure, similar to those instituted for **Fedwire** transfers. It has, however, limited each government securities transaction to \$50 million.<sup>75</sup>

Risks in the payments system are presently greatest in the private systems that have net settlement and do not have finality of **payment**.<sup>76</sup> In CHIPS, for example, payments are not considered final until settlement has occurred. No third-party guarantees payments that have been put into the system, as the Federal Reserve does with **Fedwire**. Thus, if an institution participating in the system were to fail, all payments made by and to that institution during the day would be reversed, and settlement for the rest of the system would be recalculated minus the failed institution. Such systems are subject to systemic risk, since the removal of one failed institution from the system may affect the positions of one or more institutions in the system and could make them unable to settle. In the case of CHIPS, if settlement for the system is not possible, then all payment for the day would be reversed, which is tantamount to failure of the system.

Net settlement on CHIPS and most of the private clearing houses is accomplished at the end of the day by exchanging balances at the individual clearing banks and finally through exchange of reserve balances among the clearing banks at the Federal Reserve. The inability of one of the clearing bank's customers to be able to settle

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<sup>74</sup> When perfecting a security interest is possible, price risk on the securities remain.

<sup>75</sup> See Kantrow (1987).

<sup>76</sup> See Huertas (1986) and Humphrey (1986)

would be handled in one of two ways. Either, the net debit would be covered through an extension of credit by the clearing bank, or if the customer were a bank, then the transactions to which that bank was a party during the day could be reversed. Unlike **Fedwire**, where the Federal Reserve guarantees finality of payment, the lack of **finality** of payments on the private clearing systems is the source of systemic risk and raises the possibility of a wholesale collapse. Systemic risk arises since **backing** out payments would change the net settlement positions of **other** banks, perhaps **making** them unable to settle. If the clearing banks are unable to cover the credit, then it must either be covered by clearing bank borrowings from the Federal Reserve or else the system cannot settle. Thus, the Federal Reserve is faced with the prospects of having to rescue the private systems for which it provides the settlement services, and it is the ultimate source of credit and bearer of risk for both the publicly run and privately run clearing systems.<sup>77</sup>

The large dollar volumes of transactions involved in the dominant components of the nation's payments system approach an average volume of a trillion dollars daily and far exceed the capital of the banking system or its ability potentially to deal with systemic problems in the payments system. These systemic problems, as described, would not appear to be affected significantly by the governmental support structure put in place to protect the check clearing system. Deposit insurance, for example, is essentially irrelevant, since the accounts transferred are not federally insured. Moreover, most demand deposit accounts are evolving into zero-balance accounts. The systemic problems in the large dollar payments systems relate to possible disruptions to the flows of funds through the payments system and not the stock of funds in the payments system or in clearing institutions.

Maintaining the integrity of payment flows is a substantially more complicated and difficult problem than protecting the stock of demand deposits for a number of reasons. First, given the large size of the

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<sup>77</sup> As Huertas (1987) points out, the principle risks in these private systems stem from the net settlement policy and lack of finality that places the receiving bank in the position of extending credit to the sending bank until settlement occurs. To attempt to control these risks, CHIPS has established a net debit cap on the amounts that one bank can owe to other banks in the system. In addition, individual banks establish limits on the net amount of payments to accept from any one sending bank

transactions in the system and the size of the system itself, the resources required to support an unwinding of even a short-run problem may be very large, and could exceed the capacity of the private participants to self-insure themselves. The overnight extension of loans of \$22.6 billion to the Bank of New York is an example of the sums that could be involved. Second, because the transactions are electronic and occur instantaneously, monitoring the transactions and the net position of each participant is critical to controlling credit-risk exposure by participants and the Federal Reserve, presently the ultimate creditor in both the private and public systems. Third, many of the risks that the Federal Reserve faces in its payments system activities are derivative risks that flow into the system because bank customers may be initiating transactions for which they suddenly may not be able to pay, which would only become obvious when the clearing banks would be unable to settle. These derivative risks might be domestic or international in their origin, and in the case of foreign risks, are beyond the jurisdiction or control of U.S. authorities. Fourth, because of the international character of CHIPS, failure of non-U.S. banks to be able to settle could cause the collapse of CHIPS, which in the process of unwinding transactions could also affect the domestic payments system, as well. In such circumstances, the inability of the ultimate creditor to control or monitor the risks posed by foreign institutions, except by limiting net exposure to the system at any one time, puts the Federal Reserve in a difficult position. Fifth, when the international activities of U.S. banks and the links between our domestic payments system and the foreign banking organizations are recognized, it becomes difficult to conceive of ensuring domestic financial stability without also ensuring international financial stability. Sixth, much of the present risks that are part of the large dollar payments system are in large part functions of system structure and design. Putting the system on a real-time basis and eliminating net settlement policies, which is becoming feasible with current technology, would eliminate the large overdraft and credit risk problems that are the core of the payments system risks today. Eliminating the credit features of the payments system would make it function similar to futures markets, where the operator of the system has virtually no risk exposure. If this were to be done for the payments system, then the question arises whether operating the switching and accounting mechanism is a proper governmental function.

### *Some deposit insurance reform issues*

It has been argued that the present deposit insurance system may be becoming less relevant as a mechanism to ensure the safety and soundness of the financial system. As the costs of converting financial assets from one form to another decline, it becomes less and less certain what a transaction account is. In the extreme, if electronic barter becomes prevalent, then there is really little need to maintain a transaction account at all, and it is not at all clear what assets, financial or nonfinancial, should be insured. In such circumstances, the function of deposit insurance becomes one of providing a risk-free asset for those individuals that do not have access to a diversified portfolio or for whom transaction and information costs remain high. Arguably, this is the very function that deposit insurance was to address when it was instituted during the Depression. However, it is difficult to argue, especially in the present financial environment, why the U.S. government should provide wealth insurance in this way. Granting a government guarantee to a private institution today is discriminatory and it introduces distortions into the financial system. When the guarantee is mispriced, as it presently is, then the contract increases the risk in the financial system and requires a costly system of regulation and monitoring. Even if the system were properly priced, theoretical research suggests that regulation would still be required, and this would tend differentially to handicap and advantage competitors in financial service markets. Finally, if it is determined that wealth insurance is a proper governmental function, than offering small denomination government debt instruments to the public would be a much less costly and more effective way to accomplish the same purpose.

### **Conclusions**

This paper argues that the process of financial innovation, technological change, and deregulation have significantly changed the structure and character of the U.S. financial system. By inference, there is no reason to believe that the changes we are observing will be slowed or that the fundamental underlying economic forces driving those changes will be less important in the future than they have

been in the past. Several important observations are made. First, the key attribute of the changes we have observed is the continued erosion of market imperfections that have given financial intermediaries the opportunity to operate profitably over the direct credit markets. As the result of these changes, bank liabilities no longer perform their same unique functions in the nation's payment system as transactions and information costs are lowered. Second, because of internationalization and the integration of the U.S. and foreign financial sectors, new risks are introduced and these cannot be ignored in designing regulatory reform proposals. Moreover, the ability of financial institutions to engage in structural arbitrage means that it is no longer possible to constrain our domestic institutions through regulation without (1) creating opportunities for foreign institutions to achieve a competitive advantage in our domestic markets, (2) providing incentives for the domestic customers to seek lower cost alternatives abroad, or (3) driving our domestic financial institutions abroad, where they may be less constrained. Third, concerns for maintaining the safety and soundness of the payments system differ significantly from those that were relevant when the present regulatory structure was put in place. Deposit insurance in its present form is becoming less and less relevant to ensuring the safety and soundness of the financial system, and these problems will not be solved by simply changing the methods by which we price deposit insurance. Fourth, the primary concern in maintaining the safety and soundness of the payments system is assuring the integrity of the flow of payments through the payments system rather than stabilizing the stock of a particular financial asset. The principal risks that the payments system faces are uncontrolled credit risks, which arise primarily because of the way public and private systems operate. Net settlement **policies** and lack of finality of settlement are the chief sources of credit and systemic risks in the system as financial assets are exchanged. These could be dealt with by requiring continuous monitoring and settlement. These changes, which would reduce the role of the Federal Reserve and lower its exposure to derivative credit risks flowing from international markets, also raise the question of whether there is a role for the Federal Reserve in operating what would then amount to an electronic switching and accounting system.

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