Incidental Paper:

Risk Allocation in International Interbank Electronic Fund Transfers: CHIPS & SWIFT

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An incidental paper of the Program on Information Resources Policy.

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Incidental Paper No. I-82-1.   June 1982.

Project Director: Oswald H. Ganley

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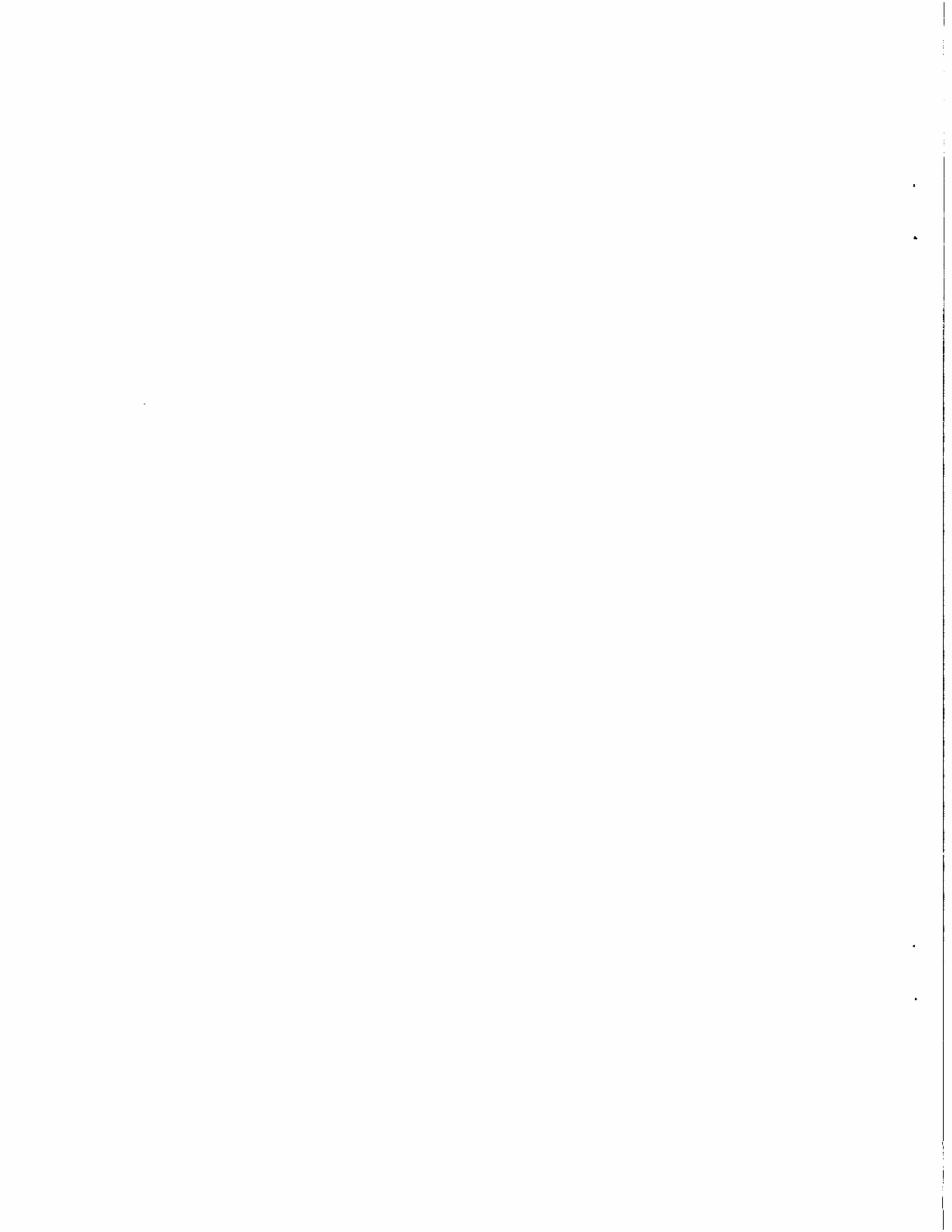Printing 5 4 3 2

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1983

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Herbert F. Lingl

Summary

Data communications is still the new boy on the international communications block. Legal questions can therefore be expected to keep surfacing as the quantity of the traffic grows and the content becomes more valuable.

Liability has already been singled out as a priority item by the OECD Committee on Information, Computer and Communications Policy (ICCP). This paper is an interesting model for the examination of an old legal problem like liability in the context of the application of new electronic technologies.

Mr. Lingl looks at two quite different risk allocation schemes by the electronic financial systems, CHIPS* and SWIFT**, both of which are important because they transmit data worth billions of dollars. some estimates put their daily value as high as $300-400 billion.

As with other payments mechanisms, CHIPS and SWIFT participants risk three kinds of losses: principal losses, interest losses, and losses resulting from fluctuations in foreign exchange. In addition, participating banks may be liable for damages, whether due to delay in transmission, faulty information introduction, or a participant's inability to settle the day's transactions. Hardware and software failure and personnel processing mistakes usually cause delays and faulty information losses. Failure to settle, on the other hand, normally results from a failure at one of the transferring banks.

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*New York Clearinghouse Association's Clearinghouse Interbank Payments Systems (CHIPS)
**Society for Worldwide Interbank Financial Telecommunications (SWIFT)

There is no national legislation covering these types of risks. While the U.S. enacted the Electronic Funds Transfer Act in 1978, it specifically excluded interbank transfers and concerned itself with consumer rights.

The international response to such problems has been limited largely to some court decisions which give no clear guidelines. The United Nations Conference on International Trade law (UNCITRAL) has directed substantial efforts toward drafting a uniform law on bills of exchange and promissory notes. However, this convention has not been ratified. And the situation is equally unclear in other areas of transborder data flow, as is the role of private contracts governing liability in case of error, fraud or computer assisted crime.

The area of international law needs urgent attention since computer communications will undoubtedly be in the forefront of international communications and trade in the near future. This paper is a good step in that direction.

<div style="text-align: right">Oswald H. Ganley</div>

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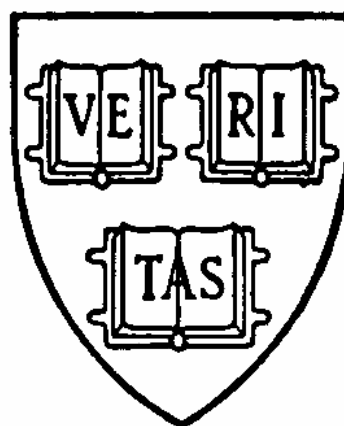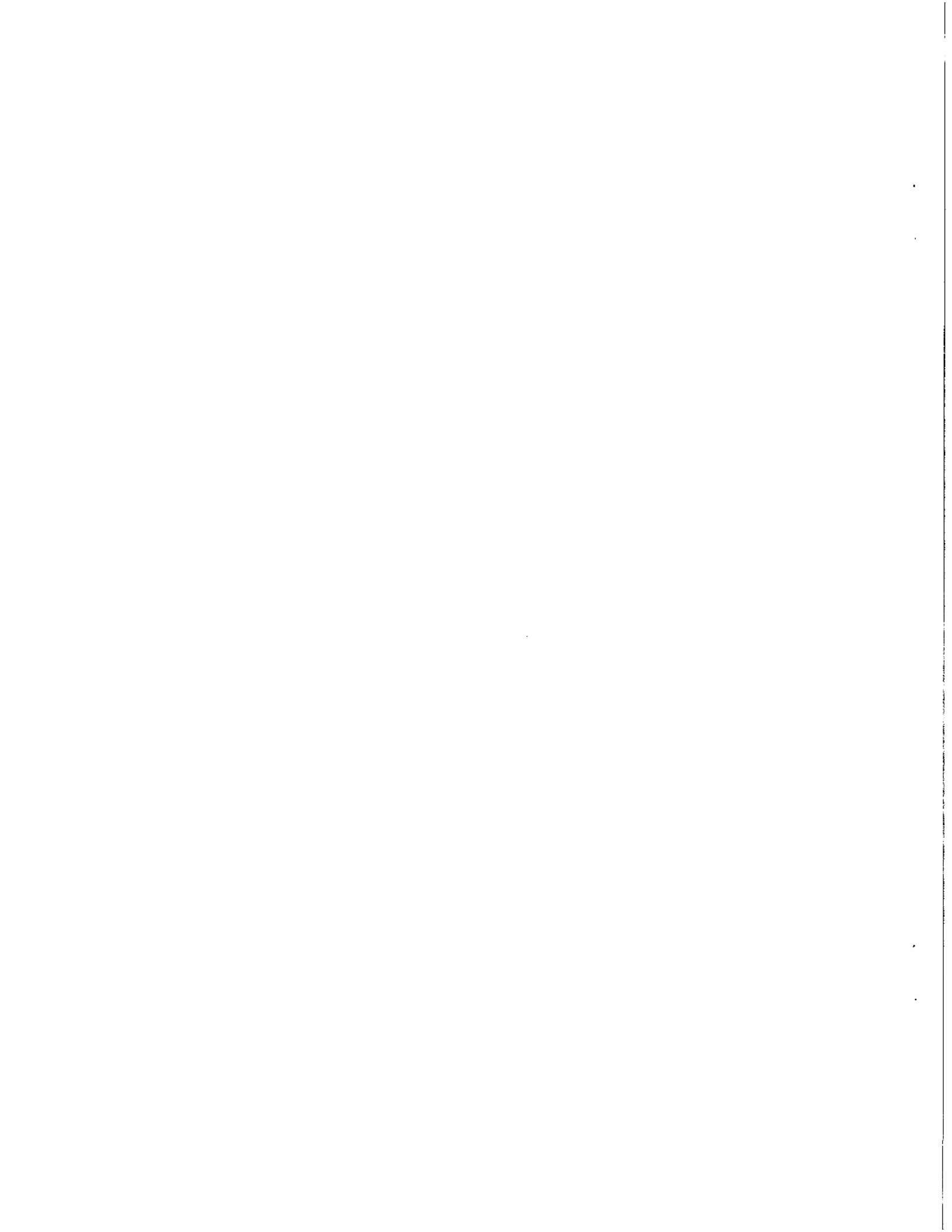
Risk Allocation In International Interbank Electronic Fund Transfers: CHIPS & SWIFT

HERBERT F. LINGL

Since the New York Clearing House Association's Clearing House Interbank Payments System (CHIPS) began operation in 1970, banks have increasingly utilized computerized telecommunications systems to effectuate international interbank payments.[1] The two systems that process the bulk of today's international transactions, CHIPS and the

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1. *See* Kutler, *SWIFT U.S. Center To Start Up in Feb.; Bank Connections Slated for 1980–81,* Am. Banker, Dec. 4, 1979, at 3, col. 3.

Three methods of transferring funds are used in international transactions: bank drafts, air mail transfers and electronic transfers. Regulation E, Electronic Fund Transfers, 12 C.F.R. § 205.2(g) (1981) defines an electronic fund transfer as "any transfer of funds, other than a transaction originated by check, draft, or similar paper instrument that is initiated through an electronic terminal, telephone, or computer or magnetic tape for the purpose of ordering, instructing, or authorizing a financial institution to debit or credit an account." For a discussion of bank drafts and air mail transfers, *see* Harfield, *Elements of Foreign Exchange Practice,* 64 HARV. L. REV. 436, 441–42 (1951). Electronic means of transferring funds are increasingly used because their speed substantially reduces the float involved in these transactions. In large transfers the interest savings can be substantial. In fact CHIPS and SWIFT reduce the amount of time in a transfer even further than did previous wire transmissions. Steve Shutz, SWIFT supervisor for the Swiss Bank Corporation's London branch notes that a SWIFT transfer takes about 25 seconds, while a telex transfer takes about 2 minutes. *SWIFT is Up and Running,* Euromoney, Nov. 1981 at 155, 157.

Though this may somewhat overstate SWIFT's speed, *see, e.g.,* time estimates in Corcelles, *Priority Use in the System,* in SOCIETY FOR WORLDWIDE INTERBANK TELECOMMUNICATIONS, S.W.I.F.T. INTERNATIONAL BANKING OPERATIONS SEMINAR 21 THROUGH 25 SEPTEMBER 1981 at 66 (1981) [hereinafter cited as SIBOS 1981]), the technology continues to advance rapidly. In addition to new data processing technology, transmission technologies are being rapidly improved. C. Reuterskiöld, the General Manager of SWIFT notes that, "Optical fibers will allow us to transmit more information more rapidly and economically. Satellite transmissions will simplify network dynamics and assure reliable connections to the remotest regions. Laser transmission media will enhance both speed and security of transmissions." C. Reutserkiöld, *The Future: Opportunities and Challenges,* in SIBOS 1981, *supra,* at 3.

Many of the world's public telex networks have become heavily overburdened. In Western Europe only one out of every three telex connections is obtained on the first attempt. S.A. Ernst, *BankAmerica Corporation Solution to S.W.I.F.T.,* in SIBOS 1981, *supra,* at 85.

For a comparison of the speed of the three methods of transferring funds, *see* Trolle-Schultz, *International Money Transfer Developments,* 9 J. BANK RESEARCH 73, 75 (1978).

Society for Worldwide Interbank Financial Telecommunication (SWIFT) transmit daily transactions totaling well over $300 billion.[2] In both CHIPS and SWIFT, however, participants have experienced financial losses from a variety of causes.[3]

This Comment examines the manner in which risks of financial loss in fund transfers are currently allocated by private agreement, judicial decisions, and national legislation. It then explores various legal mechanisms that might promote a more efficient allocation of risk.

I. THE PAYMENTS SYSTEMS

CHIPS and SWIFT have allocated some risks in substantially different manners, partly because they use differing modes of settlement and are organized differently.

SWIFT is a non-profit cooperative company[4] organized under Bel-

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2. CHIPS alone has exceeded this volume of daily transactions. *See* R. Trigaux, *CHIPS Shift to Same-Day Settlement Moved $394.3 Billion Without Hitch*, Am. Banker, Oct. 3, 1981, at 3, col. 1. The value of SWIFT traffic, on the other hand, cannot be accurately estimated since the SWIFT system reads only the destination of messages, and not their content. Memorandum from Richard Huff to BaTT Task Force, Controller of the Currency, Administrator of National Banks, March 30, 1981 [hereinafter cited as SWIFT Memorandum] (unpublished memorandum in Harv. Int'l L.J. Library).

A comparison based on the figures illustrates the volume passing through these systems. The United States banking system completes about $15 trillion in check transactions in one year. Mayer, *The Settlements Revolution*, Institutional Investor, Sept. 1981, at 358, 360. CHIPS alone does the same volume in less than three months.

3. SWIFT Board Paper 185, for example, notes that: "interest losses have been sustained by members as a result of Senders or Receivers failing to adhere to the rules and the co-operative intent of the Society. Further, S.W.I.F.T. has on occasion 'failed to perform,' causing interest losses also." SWIFT BOARD PAPER NO. 185, *Responsibility and Liability, reprinted in* SWIFT Newsletter, Apr., 1979 at 2.

Other dramatic illustrations of electronic fund transfer system failure include a recent inadvertent double processing of a $1 million payroll by the Michigan Automated Clearing House Association. The Amway Corporation "was out an unexpected $1 million . . . and had to exert considerable effort to reverse the mistake." Kutler, *Inefficient Handling of Return Items Hinders Selling Corporations on ACH*, Am. Banker, Aug. 6, 1980, at 1, col. 1.

Also consider the loss of $150 million in the Federal Reserve System's computer network described by M. STIGNUM, THE MONEY MARKET: MYTH, REALITY AND PRACTICE 279 (1978):

This actual situation resulted from something happening that was never supposed to happen. A wire transfer of Fed Funds got lost in the Fed's computer network. The San Francisco Fed sent out the notice of the transfer of funds, but that message was not received by the New York Fed; it simply disappeared in the Fed's switching center at Culpepper, Virginia:

SCENE: Late Wednesday afternoon on the Fed funds desk of a major New York bank. "Where is that 150 million we bought?"

"The bank swears they sent it."

"Then why the hell hasn't the transfer gone through the San Francisco Fed?"

"The bank says their computer broke down. They had to deliver the transfer request by hand."

"Is that money coming or not? Call the New York Fed! Ask them if they'll keep the wire open or let us do an 'as of' tomorrow. Damn! This is enough to make an atheist out of a priest."

4. SOCIETY FOR WORLDWIDE INTERBANK FINANCIAL TELECOMMUNICATION, GENERAL

gian law,⁵ which is wholly owned by its over 800 member banks.⁶ All member banks hold shares which are reallocated each year in proportion to each member's use of SWIFT services.⁷ Every year the shareholders elect a Board of Directors⁸ which chooses a General

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TERMS AND CONDITIONS OF SOCIETY FOR WORLDWIDE INTERBANK FINANCIAL TELECOMMUNI-CATION, art. 4. [hereinafter cited as SWIFT, GENERAL TERMS AND CONDITIONS] This article provides:

> The members intend to cause the Company to work on a non-profit making basis. Therefore, if there would remain at the end of any financial year of the Company a credit balance, the members undertake to apply at least 5% of the credit balance to the legal reserve fund until this amounts to 10% of the outstanding share capital of the Company. The remaining balance shall be applied as determined by the General Meeting taking into account the proposal of the Board of Directors.

Id. SOCIETY FOR WORLDWIDE INTERBANK TELECOMMUNICATION, ARTICLES OF ASSOCIATION OF SOCIETY FOR WORLDWIDE INTERBANK TELECOMMUNICATION, art. 3. [hereinafter cited as SWIFT ARTICLES OF ASSOCIATION]. This article provides:

> The object of the Company is for the collective benefit of the members of the Company, the study, creation, utilization and operation of the means necessary for the telecommun-ication, transmission and routing of private, confidential and proprietary international financial messages between the members of the Company.

5. *Id.* art. 43. This article provides:

> All matters which are not provided for in these Articles of Association shall be governed by the "Gecoordineerde Wetten op de Handelsvennootshappen" (Consolidated Acts on Commercial Corporations). *Id.*

In addition, the SWIFT User Handbook provides that "All relations including the rights and obligations between S.W.I.F.T. and the users shall be governed by the laws of Belgium." SOCIETY FOR WORLDWIDE INTERBANK FINANCIAL TELECOMMUNICATION, S.W.I.F.T. USER HANDBOOK (1981), § 7, ch. 7, ¶ 3 [hereinafter cited as SWIFT USER HANDBOOK.]

6. As of September 1981 SWIFT had 857 member banks in 32 different countries. SWIFT continues to expand. The network expects to expand its membership to Eastern Europe by admitting Czechoslovakian banks in the near future. C. Reuterskiöld, *supra* note 1, at 1.

BankAmerica alone has SWIFT connections for its branches and subsidiaries in Chicago, Hong Kong, Houston, London, Los Angeles, Miami, Milan, New York, Paris, Quito, San Diego, San Francisco, Singapore and Tokyo. Ernst, *supra* note 1, at 85.

7. SWIFT ARTICLES OF ASSOCIATION, *supra* note 4, art. 9(a). This article provides that the Board of Directors shall allocate shares as follows: "Each new member admitted to the Company shall initially be allocated new shares in the capital of the Company in proportion to the estimated usage of the services of the Company by that member." In addition, article 9(b) provides that:

> The shares in the capital of the Company shall be reallocated amongst the members following each financial year of the Company. Such reallocation will be proportional to the actual usage of the services of the Company by each member, and include all members who have been connected to the network of the Company prior to the end of the previous financial year, unless the Board of Directors is of the opinion that there is no sufficient reason to involve one or more of such members in the reallocation.

8. *Id.* art. 19. The process for electing the Board is based on a nation-vote principle. Article 20 provides that:

> a) All members from a nation who own together at least 1,50% of the outstanding share capital may propose collectively to the General Meeting one director per nation for election.
> b) All members from a nation who do not own together a minimum percentage of shares mentioned under (a) may collectively [propose a director together with other members in a similar situation or request an elected Director to represent them]. . . .
> d) Any individual nation owning at least 6% of the outstanding share capital may propose one additional director for election.

If the number of directors proposed by this process exceeds 25, the Board of Directors consists of the 25 directors "proposed by those nations or groups of nations holding the largest share representation per nation or group of nations." *Id.* art. 20(e).

Manager[9] and has the power to implement changes in provisions governing SWIFT's allocation of liability,[10] to admit new members[11] and to expel members.[12] To become a member an organization must be engaged in banking and transmit international financial messages.[13]

SWIFT is a computerized telecommunications network that transmits messages for its members.[14] Banks can transmit payment messages ordering fund transfers in a wide variety of currencies. Settlement between banks is effected by debits and credits to correspondent accounts.[15] For example, if a Swiss bank wishes to transfer $1 million to a Japanese bank's account with its New York correspondent bank,

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9. *Id.* art. 28.

10. For example, the Board approved the liability allocations of BOARD PAPER 185 drawn up by a special Working Group on Responsibility and Liability. *See* SWIFT Newsletter, Apr., 1979 at 1.

11. SWIFT ARTICLES OF ASSOCIATION, *supra* note 4, art. 8. This article provides:

Any organization may be considered for admission to membership in the Company which in the opinion of the Board of Directors is involved in the same type of business as the members and which is involved in international financial message transmission. *Id.*

In addition, if an organization would be eligible but faces "obstacles because of statutory limitations or regulations" that organization "may propose for admission to membership in the Company an organization which holds shares in or whose shares are held by the eligible organization." *Id.*

Admission to membership requires approval of a majority of the Board of Directors. Thereafter, the Board notifies the members of the nation of the applicant. If a majority of these members, based on their share representation, disagree with the Board of Directors' decision, the application is submitted to the General Meeting for a vote.

12. *Id.* art. 13.

13. *Id.* art. 8.

14. A SWIFT Member can send a variety of different messages. Currently the SWIFT message categories are: customer transfers, bank transfers, foreign exchange confirmations, special reconciliation messages, and collection messages. Categories for documentary credits and securities are being designed.

In addition, there are system messages which allow the banks and the system to communicate. These messages are used "to request the system to perform functions, provide services and issue reports." SWIFT, SWIFT BROCHURE 17 (undated) [hereinafter cited as SWIFT BROCHURE]. Perhaps the most important of these messages is the Undelivered Message Report. See note 24 *infra*. Other messages include a Return Message Report which is sent if the sending bank does not fulfill the message format requirements, or if a receiving terminal is out of service. At midnight, local time of each bank, every terminal receives a Message Status Report which informs the user of the number of messages sent and the number of messages received in the previous 24 hours.

15. Banks which use correspondent relationships to make international payments maintain foreign currency accounts with each other. Correspondent relationships remain an important means of making international payments. BankAmerica, for example, maintains 3,053 correspondent relationships worldwide. Ernst, *supra* note 1, at 85.

SWIFT has not given serious consideration to providing settlement services "because of the complexity of 24-hour worldwide operation and multiple currencies." SWIFT Memorandum *supra* note 2, at 1.

The SWIFT Memorandum also notes that the SWIFT system may be increasingly utilized for domestic transfers as well as international transfers, and that "in the U.S., this could have a major effect on BankWire." *Id.* at 1.

For a discussion of the distinction between settlement through a clearinghouse and settlement by correspondent relationships in an historical context, *see* Scott, *The Risk Fixers*, 91 HARV. L. REV. 737, 740–47 (1978).

it orders the New York bank to credit the Japanese account. If there are sufficient funds in the Swiss bank's account, the New York bank settles by debiting the Swiss bank's account and crediting the Japanese bank's account.[16] Otherwise, the New York bank assumes a credit risk and settlement may be effected through other means.

Often, however, a bank wishing to make a transfer does not have a correspondent relationship with any banks with which the transferee has an account. If, for example, the Swiss bank does not have an account with the New York bank that holds the Japanese bank's account (NY Bank B) it must settle the transfer through one of its correspondents (NY Bank A) which does have an account with NY Bank B. To transfer the funds to the Japanese bank's account, NY Bank A debits the Swiss bank's account. NY Bank B then debits NY Bank A's account and credits the Japanese account. Thus, the intended transfer from the Swiss bank's account to the Japanese bank's account can be settled through NY Bank A's correspondent relationship with NY Bank B, as illustrated in Figure 1.

When the terminal operator in Switzerland first enters the payment message,[17] he must enter it in a standardized format,[18] facilitating automated processing by SWIFT[19] and by the New York bank.[20] The message travels through national leased lines to a regional processor, which collects all of the transactions in a given state.[21] There the messages are encrypted and sent to an operating center which decrypts them and processes the transaction.[22] Messages are again encrypted

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16. Often these accounts are overdrafted for a brief period of time, particularly in foreign exchange transactions.

17. A payment message may be entered either as urgent or normal priority. For a discussion of the conflicting concerns of speed and safety *see* de Corcelles, *Priority Use in the System*, in SIBOS 1981, *supra* note 1, at 65. Messages in each priority category are processed on a first-come first-served basis.

18. This SWIFT transmission contains an input sequence number, the sending and receiving banks' code numbers, the name and address of the transferee, the amount of the transfer, the date on which the receiving bank obtains the use of the funds and the date of payment to the beneficiary. SWIFT BROCHURE 16–17 (1980); SOCIETY FOR WORLDWIDE INTERBANK FINANCIAL TELECOMMUNICATION, SWIFT USER HANDBOOK (1981) [hereinafter cited as SWIFT User Handbook].

19. SWIFT rejects the message text if it does not conform with mandatory standards, thus ensuring that the message the receiving bank receives will be processed. The SWIFT system also adds a variety of trailers which are discussed at note 61 *infra*.

20. The message received by the New York bank can be processed by computer and transferred directly into another payments system. CHIPS, for example, provides for an interface with SWIFT to facilitate this type of processing. *See* NEW YORK CLEARING HOUSE ASSOCIATION, CHIPS ADMINISTRATIVE PROCEDURES, ADMINISTRATIVE PROCEDURE No. 6, "CHIPS/SWIFT; USE OF REFERENCE FIELD," *adopted* July 21, 1977.

21. SWIFT has message entry and release features similar to those in CHIPS. See note 33 and accompanying text *infra*. However, these functions are performed primarily by the interface to SWIFT at the sending bank. SWIFT BROCHURE, *supra* note 14, at 19.

22. Currently, there are three operating centers: one in Belgium, one in the Netherlands and one in Culpepper, Va., United States.

Figure 1
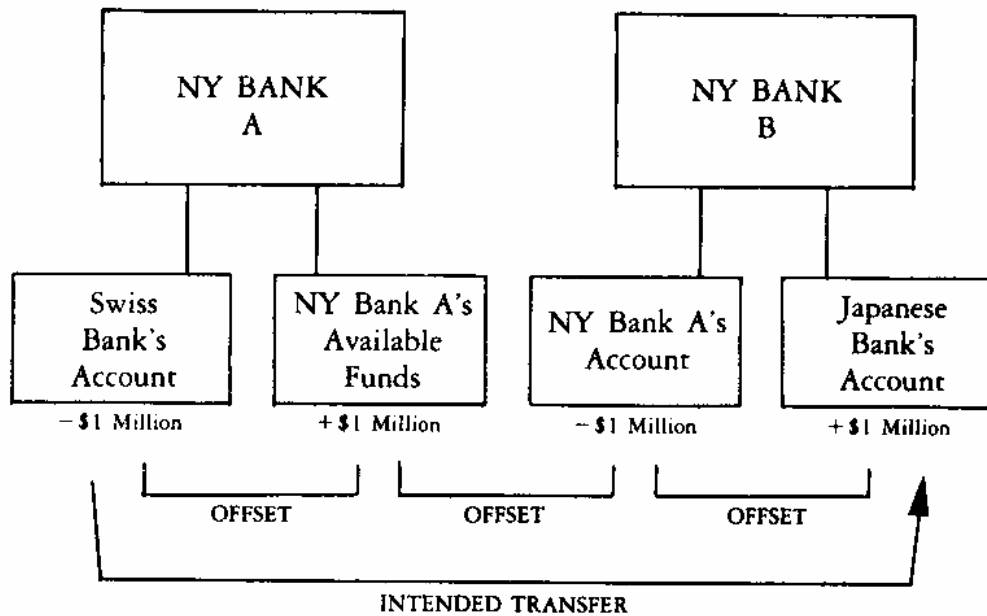
before being transmitted on international leased lines[23] to the regional processor in the receiving bank's state. If a message cannot be transfered, the sending bank receives notification on an undelivered message report.[24]

CHIPS is a department of the New York Clearing House Association.[25] It clears approximately 90 percent of all international interbank dollar transactions.[26] Its rules are approved and amended by

23. For a discussion of currently available options and how these systems operate, *see* Mitchell, *Telecommunications in the '80s*, in SOCIETY FOR WORLDWIDE INTERBANK TELECOMMUNICATIONS, S.W.I.F.T. INTERNATIONAL BANKING OPERATIONS SEMINAR 1980 [hereinafter cited as SIBOS 1980] at 25. *See also* Grainson, *European Telecommunications Services in the '80s*, in SIBOS 1980, *supra* at 17; Shapiro, *The Role of Public Networks in Bank Communications*, in SIBOS 1981, *supra* note 1, at 51.

24. The Undelivered Message Report is issued to each sending bank once every 24 hours. It notifies the bank of all messages which have not been sent by that bank that have not yet been delivered to their destinations. Usually, these messages are undelivered simply because the receiving bank is logged out at the time that the report was issued. *See* SWIFT BROCHURE, *supra* note 14, at 15.

25. NEW YORK CLEARING HOUSE ASSOCIATION, CONSTITUTION OF THE NEW YORK CLEARING HOUSE ASSOCIATION, art. IV, § 3(H) (1981). This section authorizes the establishment and maintenance of a Computer Department.

CHIPS rules are formulated by the Clearing House Committee, a committee composed of the chief-executive officers of twelve members of the New York Clearing House Association. The following banks are currently members of the Clearing House Committee: Bank of New York, Chase Manhattan Bank, Citibank, Chemical Bank, Morgan Guaranty Trust Co. of New York, Manufacturers Hanover Trust Co., National Bank of North America, Irving Trust Co., Bankers Trust Co., Marine Midland Bank, United States Trust Co., and European-American Banking Corp.

The New York Clearing House Association is a non-profit association organized under the laws of New York in 1853.

26. Bennett, *Same-Day Settlement Begins Today for Banks*, N.Y. Times, Oct. 1, 1981, at D1, col. 1; Lachica, *Asian Banks Are Eager To Plug Into Exclusive International Network*, Asian Wall

a Clearing House Committee consisting of 12 Clearing House member banks which in its discretion may permit non-members to participate in CHIPS.[27] To become a CHIPS participant a bank must have an office in New York and be subject to federal or New York regulation.[28]

The banks participating in CHIPS are divided into two groups: the settling participants,[29] seventeen banks, twelve of which are members of the New York Clearing House Association,[30] and non-settling participants which comprise the remainder of the banks participating in the system.[31] The settling banks have the ultimate responsibility for the settlement of transfers in the system.

To illustrate a CHIPS transfer, suppose the Swiss bank in the example above wants to transfer $1 million from its account in New York Bank A, to a Japanese bank's account held by New York Bank B. First, the Swiss bank sends an instruction to Bank A. This in-

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St. J., Aug. 31, 1981. The CHIPS system was developed to efficiently clear Eurodollar payments, and at present the efficient functioning of the Eurodollar market is dependent on the continued smooth functioning of CHIPS. *See* M. STIGNUM, *supra* note 3.

Since participation in the system is essential for certain transactions, many banks would like to join CHIPS, but the New York Clearing House has currently frozen membership. Lachica, *supra*. See also note 82 *infra*.

27. The NEW YORK CLEARING HOUSE ASSOCIATION, CONSTITUTION OF THE NEW YORK CLEARING HOUSE ASSOCIATION, art. IV, § 3(H) grants the Clearing House Committee the authority to prescribe CHIPS rules and regulations and the discretion to permit non-Clearing House members to participate. *See also* NEW YORK CLEARING HOUSE ASSOCIATION, RULES GOVERNING THE CLEARING HOUSE INTERBANK PAYMENTS SYSTEM, Preamble (1981) [hereinafter cited as CHIPS RULES].

28. The CHIPS Rules define a participant as "A banking institution which carries on the business of banking from an office located in New York City, which office is subject to regulation by the State of New York Banking Department or a Federal bank regulatory authority and which participates in the system." *Id.* rule 1(a).

29. A settling participant is defined as "[a] participant which settles for its own account and which may also settle for any other participant's account." *Id.* rule 1(d).

30. The settling banks that are members of the New York Clearing House Association (NYCHA) are: Bank of New York, Chase Manhattan Bank, Citibank, Chemical Bank, Morgan Guaranty Trust Co. of New York, Manufacturers Hanover Trust Co., Irving Trust Co., Bankers Trust Co., United States Trust Co., National Bank of North America, Marine Midland Bank, and European-American Banking Corp.

The settling participants who are not members of NYCHA are Philadelphia National Bank, Continental Illinois Bank & Trust, Bank of America, First Interstate Bank, and Fidelity Bank of Philadelphia. The latter four are represented by their Edge Act subsidiaries in New York.

31. Non-participants may be required "to obtain and file a letter[s] of support from any company (a 'parent company') which, by itself or with others, directly or indirectly owns or controls such participant or from any company which is owned or controlled by a parent company[ies]." *Id.* rule 19(a).

The Clearing House Automated Payments System (CHAPS), which is being implemented in London, is designed in a similar fashion with 12 settling banks and about 300 other banks which have an account with a settling bank that they use as a clearing agent. J.A. Brooks, the Deputy Group Chief Executive of Marine Midland, Ltd., U.K. recognizes some of the implications of this two-tiered structure by noting that "the non-settlement banks are effectively customers of the settlement banks and of course there is competition for their clearing settlement business." Brooks, *CHAPS—Clearing House Automated Payments System*. in SIBOS 1981, *supra* note 1, at 25, 26. In addition CHAPS is designed to be compatible with SWIFT. *See* Simmonds, *Design of CHAPS*. in SIBOS 1981, *supra* note 1, at 31.

struction could, for example, be sent through the SWIFT network. Bank A then activates its CHIPS terminal and enters the transfer information which is transmitted to the CHIPS central computer.[32] The computer files and retains this message and causes the message to be typed out by the terminal. The typed message is held for approval by Bank A's account officer.[33] If approved, the form is reinserted into the terminal and released to the system; the message then becomes binding on Bank A. Otherwise it is deleted from the system.[34]

As transfers are made in the course of a day, each bank accrues debits and credits. CHIPS central computer correlates all of the transactions and nets out the debits and credits of each participant, calculating a "net net balance" for each participant, which represents that participant's overall position with all other participants.[35]

The settling participants are responsible for reconciling all of these balances by making or accepting Fed Funds[36] at the end of the day.[37] Pursuant to an agreement between the Federal Reserve Bank of New

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32. Four CHIPS participants, Bankers Trust Co., Chase Manhattan Bank, Chemical Bank, and Irving Trust Co., currently permit some of their customers to enter payment messages from their own terminals. Mayer, *supra* note 2, at 364. SWIFT is currently evaluating possibilities of a customer-bank interface, having concluded that there is "growing pressure from the corporate customer to obtain more bank information for in-house customer integration." Kok, *The Growth of the International Banking Scene—A S.W.I.F.T. View*, in SIBOS 1981, *supra* note 1, at 7. At the most recent SWIFT International Banking Operations Seminar such a development was examined in some detail. *See* von Dardel, *Customer Interface with S.W.I.F.T.*, in SIBOS 1981, *supra* note 1, at 39.

33. This store and release format permits the receiving bank to monitor account positions by correlating anticipated deposits with other payment requests before it releases certain messages. For a discussion *see* Lee, *An Update on CHIPS*, 53 THE MAGAZINE OF BANK ADMINISTRATION 28, 30–31 (1977).

34. The CHIPS Rules provide that "A payment message may be stored in the system by a participant. It may be deleted at any time prior to being sent by the participant. A payment message once sent by the participant cannot be deleted by such participant and constitutes the unconditional obligation of such participant to make payment in accordance with such payment message and these Rules." CHIPS RULES, *supra* note 27, rule 2.

35. *Id.* rule 1(a). For an illustration of a simplified CHIPS day, see Figures 3 and 4, at p. 645, *infra*.

36. Federal Reserve Regulation J, Transfers of Funds 12 C.F.R. § 210.62(b) (1981). This section provides that subject to FRB rights, "credit given by a Federal Reserve Bank for a transfer by a Federal Reserve Bank for a transfer of funds to the transferee's account becomes available for withdrawal as of right by the transferee upon final payment of the transfer item or request for a transfer item." *Id.* Moreover, "[a] transfer item or request for a transfer item issued by a transferor is finally paid at the time the transfer is sent, or advice for such item is sent or telephoned, to the transferee by a Federal Reserve Bank, whichever occurs first." 12 C.F.R. § 210.62 (1981).

37. CHIPS moved to same-day settlement on October 1, 1981. *See* Bennett, *supra* note 26; Trigaux, *supra* note 2.

Before October 1, 1981, the participants had settled by 10 A.M. on the following day. For a discussion of the importance of moving from Next Day Funds to Same Day Funds, see note 126 *infra* and Mayer, *supra* note 2, at 358.

Figure 2
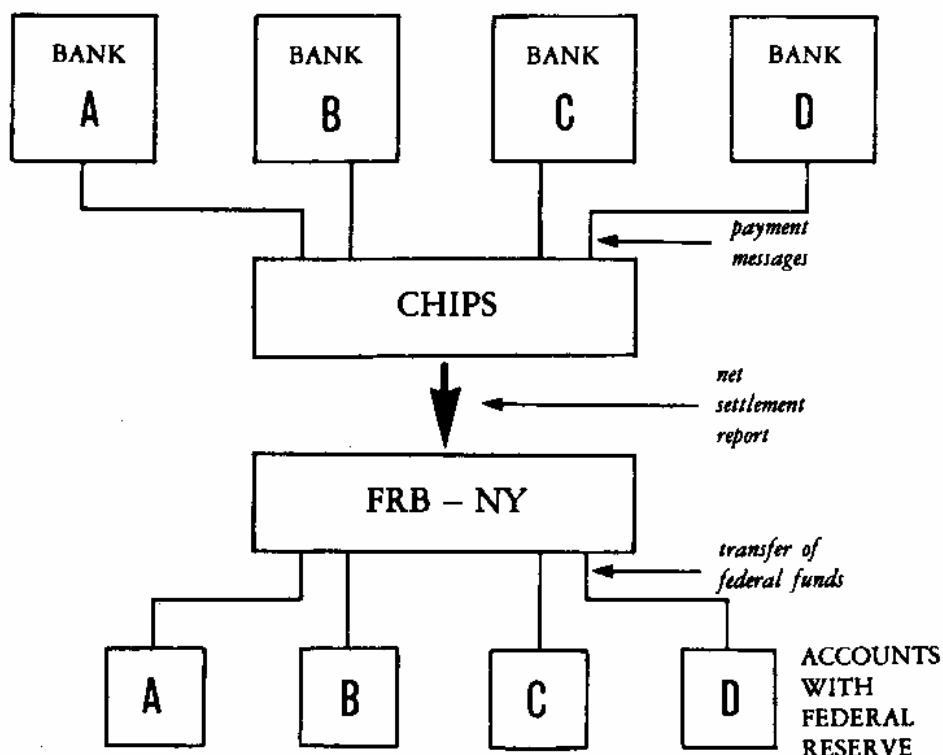
York (FRB-NY) and CHIPS, the FRB-NY maintains a special deposit account for the joint benefit of all settling banks.[38] At the end of the day, CHIPS calculates the net net balance and those of the participants for which it settles. If the composite net net balance is in a debit position, the settling bank sends Fed Funds to the special account, thus settling its own CHIPS transfers and those of its associated participants.[39] If its composite net net balance is in a credit position, on the other hand, the settling bank accepts Fed Funds. The process is illustrated in Figure 2.[40]

Each settling participant retains the power of refusing to settle for a participant bank by notifying the Clearing House that it is unwilling to do so.[41] If this occurs, the refused participant bank must find another settling participant to settle its account. If the refused participant fails to find another bank willing to settle its account,[42] it

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38. *See* Letter from Thomas C. Sloane, Senior Vice President, Federal Reserve Bank of New York to John F. Lee, Executive Vice-President, New York Clearing House Association, Aug. 14, 1981 [hereinafter cited as CHIPS Settlement Agreement].

39. *Id.*

40. This figure was inspired by course materials prepared by Professor Scott, Harvard Law School.

41. CHIPS Rules, *supra* note 27, rule 13(b).

42. A refused participant has one hour "to arrange with its settling participant or a new settling participant to settle its net net balance." *Id.* Whether another settling participant is

is expelled from CHIPS, its transactions are deleted and a revised net net balance is calculated for all other banks.[43] Expulsion does not relieve the participant from its obligation to make payment in accordance with its payment messages and the CHIPS Rules.[44]

II. RISK ALLOCATION IN CHIPS AND SWIFT

As with other payments mechanisms, a CHIPS or SWIFT participant may suffer three types of losses: principal losses,[45] interest losses[46] and losses resulting from foreign exchange fluctuations.[47] In addition a participating bank may be held liable for consequential damages.[48]

These losses may be caused by the delay of a transmission, the introduction of faulty information or a participant's inability to settle the day's transactions. Delays and faulty information may arise from hardware and software failure,[49] mistake by personnel involved in

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willing to accept the participant's debit will hinge upon whether it is willing to assume the credit risk.

43. *Id.*

44. *Id.* rule 13(d).

45. Principal losses may arise if the funds of an erroneous transfer become unrecoverable because they were withdrawn from the account to which they were deposited, see note 66 and accompanying text *infra*, or if a participant could not meet the obligations it incurred in a transfer, see note 124 and accompanying text *infra*.

46. Interest losses are caused by delays in the fund transfer process.

47. Foreign exchange losses result if a delay in the transfer is coupled with a change in exchange rates. For example, if a Swiss bank transfers dollars to a German bank through CHIPS, and the transfer is delayed, the German bank must obtain the dollars by other means. If the value of the dollar has risen, it may incur a foreign exchange loss. For a discussion of the application of SWIFT to foreign exchange transactions *see, e.g.*, Henne, *Foreign Exchange*, in SIBOS 1981, *supra* note 1, at 59.

48. *See, e.g.*, the reasoning in EVRA Corp. v. Swiss Bank Corp., No. 73 C 2643 (N.D. Ill. May 12, 1981) (which is discussed at notes 151–58 and accompanying text *infra*).

49. The potentially liable parties may include the manufacturers of the hardware and software or the programmers themselves. Recent opinions suggest that such suits against computer manufacturers may sound not only in contract but also in tort, based on either a product liability theory or what one court has referred to as "computer malpractice." *See, e.g.*, Charlos Sys., Inc. v. National Cash Register, 479 F. Supp. 738, 740 n.1 (D.N.J. 1979). *See also* Freed, *Products Liability in the Computer Age* 12 FORUM 461 (1977).

The New York Clearing House Association has promulgated several rules effective in the event of CHIPS system failure. The CHIPS Rules, provide that:

In the event that communications between the Clearing House computer and one or more participants are halted, the system is closed down, or some other emergency affects its operations, transactions shall be handled in accordance with the directions of the Executive Vice President of the Clearing House.

Without limiting the discretion of the Executive Vice President of the Clearing House, he may:

(1) Extend the hours of operation of the system;

(2) Extend the time for determining the net net balance of each participant;

(3) Direct any participant, or several, or all to not make payments through the system pending resolution of the problem;

(4) Direct any participant to continue to operate within the system by utilizing the terminals at the Clearing House; or

(5) Direct such other action as he may deem necessary. . . .

processing the transaction,[50] and fraud.[51] The failure to settle on the other hand is usually caused by the failure of one of the transferring banks.[52]

This section first discusses the principles that can be used to allocate liability for each type of loss that may arise. It then presents a framework for analysis from an efficiency perspective and compares the methods by which CHIPS and SWIFT allocate losses among participating banks and the network.[53] Finally, it assesses this allocation from the perspective of the operating efficiency of the fund transfer system.

A. *Principles Guiding the Allocation of Liability*

To minimize the costs of the fund transfer process as a whole, the operating risks involved in an electronic fund transfer system should be allocated efficiently. In addition, the rules the law imposes on different methods of transferring funds should be designed in such a manner that differences in costs associated with various payment systems are based on differences in the actual costs of using such systems rather than varying degrees of risk imposed by divergent legal characterizations.[54]

The efficient allocation of risk in electronic fund transfer systems

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Unless the Executive Vice President of the Clearing House shall direct otherwise, procedures to be followed upon the occurrence of certain events are set forth in the CHIPS Administrative Procedures.

CHIPS RULES, *supra* note 27, rule 17. *See* NEW YORK CLEARING HOUSE ASSOCIATION, CHIPS ADMINISTRATIVE PROCEDURE NO. 4, EMERGENCY CHIPS PROCEDURES *adopted* Sept. 10, 1981, which provide that if "a CHIPS failure has occurred, a participant that wishes to make a payment over CHIPS may make the payment by sending the payment by Fed Wire to the receiving participant's Designated receiver"—the settling participant for that participant, or any other settling participant provided that advanced notice has been given to the Executive Vice President of the Clearing House. In addition, the New York Clearing House has promulgated a procedure governing emergency extensions of CHIPS cutoff. *See* NEW YORK CLEARING HOUSE ASSOCIATION, CHIPS ADMINISTRATIVE PROCEDURE NO. 8., GUIDANCE FOR REQUESTING EMERGENCY EXTENSIONS OF CHIPS CUTOFF, *adopted* Sept. 10, 1981.

50. Although risk of loss through fraud in interbank fund transfer has received more attention than losses resulting from error, there is reason to believe that mistakes actually account for more of the total losses. *See, e.g., Human Error Called More Frequent Cause of Computer Loss than Crime*, Am. Banker, Sept. 27, 1978, at 12, col. 1. Certainly the recent judgment against the Swiss Bank Corporation for $2 million in EVRA Corp. v. Swiss Bank Corp., No. 73 C 2643 (N.D. Ill. May 12, 1981), lends support to this proposition. The loss there was caused by Swiss Bank Corp. personnel failing to keep paper in a telex machine.

51. For a discussion of this problem, see note 113 *infra*.

52. See note 124 *infra*.

53. Neither the CHIPS or SWIFT operating agreements purport to allocate liability between participating banks and their clients. *See* CHIPS RULES, *supra* note 27, rule 14; SWIFT ARTICLES OF ASSOCIATION, *supra* note 4.

54. H. SCOTT, NEW PAYMENT SYSTEMS: A REPORT TO THE 3-4-8 COMMITTEE OF THE PERMANENT EDITORIAL BOARD FOR THE UNIFORM COMMERCIAL CODE 38-40 (1978). *See* note 148 and accompanying text *infra*.

should be grounded on two basic principles. First, risk of loss should
be placed on the party in the best position to discover and prevent
defects and omissions — that is, the cheapest cost avoider.[55] This
principle is reflected in the Uniform Commercial Code's (U.C.C.)
treatment of negotiable instruments[56] and is used to allocate risk in
other areas of the law.[57] Second, strict liability should be imposed
on the cheapest cost avoider when that party is also best able to absorb
and spread losses.[58] A serious problem in funds transfers is discovering

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55. For a discussion of the concept of cheapest cost avoider, *see, e.g.*, Calabresi and Hirschoff, *Toward a Test for Strict Liability in Torts*, 81 YALE L. J. 1055 (1972) and note 57.

See also Greguras, *The Allocation of Risk in Electronic Fund Transfer Systems for Losses Caused by Unauthorized Transactions* 13 U.S.F. L. REV. 405, 406 (1979). Greguras notes that "the objective of laws which allocate the risk of loss and establish duties to prevent loss or to avoid further loss should be to minimize losses to all electronic fund transfer (EFT) system participants, not just consumers." *Id.*

56. The U.C.C., for example, allocates liability for forged instruments on the party best positioned to avert loss: the party who accepted the forged instrument. U.C.C. §§ 3-414, 3-417, and 4-207.

57. For a discussion of the potential applicability of the principles underlying products liability to banks, *see, e.g.*, Burik, *The Design of Deposit Insurance Contracts: Lessons from Product Liability Theory*, in FEDERAL RESERVE BANK OF CHICAGO, PROCEEDINGS OF THE CONFERENCE ON BANK STRUCTURE AND COMPETITION 194, 196-201 (1980).

An exposition of the cheapest cost avoider concept in torts can be found in G. CALABRESI, THE COST OF ACCIDENTS (1970); Coase, *The Problem of Social Cost*, 3 J. L. & ECON 1 (1960).

See also Escola v. Coca Cola Bottling Co., 24 Cal.2d 453, 462, 150 P.2d 436, 440–41 (1944) (Traynor, J., concurring): Montgomery & Owen, *Reflections on the Theory and Administration of Strict Tort Liability for Defective Products*, 27 S.C. L. REV. 803, 809–10 (1976); Note, *Products and the Professional: Strict Liability in the Sale-Service Hybrid Transaction*, 24 HASTINGS L. J. 111, 117 (1972).

58. *See* Escola v. Coca Cola Bottling Co., 24 Cal.2d 453, 462, 150 P.2d 436, 441 (1944) (Traynor, J. concurring); Worrell v. Barnes, 87 Nev. 204, 207, 484 P.2d 573, 575 (1971); RESTATEMENT (SECOND) OF TORTS § 402A, Comment c (1965).

The principles for the allocation of strict liability based on risk spreading first developed in the area of products liability. Such principles may not always be applicable with equal force to the sale of services. Service providers are often less able to detect and eliminate defects and often have less control over the products with which they must work. *See* Note, *Strict Liability in Hybrid Cases*, 32 STAN. L. REV. 391, 396–98 (1980). Thus, a regime of strict liability may not deter defects any more effectively than one of liability for negligence. In addition service providers may sometimes be less able to spread losses.

Transferring funds via a network has both service and product components. As is increasingly recognized by courts and commentators, these hybrid businesses present special problems in determining the appropriate allocation of liability.

Courts have attempted to draw the distinction between products and services on numerous grounds. Some courts have focused on the business setting of the transaction. In Johnson v. Sears, Roebuck & Co. 355 F. Supp. 1065, 1067 (E.D. Wisc. 1973), the court ruled that strict liability should apply to the "mechanical and administrative services" hospitals offer, but not to the professional services of doctors. Other courts have focused either on the origin of the defect or the essential nature of the transaction. For cases in which courts have used the source of the defect to determine whether to apply strict liability, *see* Shaffer v. Victoria Station, Inc., 18 Wash. App. 816, 572 P.2d 737 (1977), *rev'd*, 91 Wash.2d 295, 588 P.2d 233 (1978) (wine glass in restaurant not part of service offered); Nastasi v. Hochman, 58 A.D.2d 564, 396 N.Y.S.2d 216 (1977) (inflight fire caused by navigation equipment due to installation). For cases which have used the "essence of the transaction" as a test, *see* Milau Assocs. v. North Ave. Dev. Corp., 42 N.Y.2d 482, 368 N.E.2d 1247, 398 N.Y.S.2d 882 (1977); Lee v. Griffin, 121 Eng. Rep. 716 (Ex. 1861) (if transaction results in a saleable good it was not

how a particular error was caused and where it arose.[59] If a claimant can prove that it did not cause the error, imposing strict liability on the system in instances where it is both best positioned to discover certain defective messages and spread the losses may avoid the administrative costs of determining where a particular error occurred[60] while creating incentives to minimize those errors and develop effective auditing mechanisms.[61]

For the purpose of an efficiency analysis, the transfer of funds by a system such as CHIPS or SWIFT can be understood as involving a three-stage process.[62] The first stage covers the period prior to the release of the message; the second stage covers the period between the release of the message and the receipt of the message at the receiving bank's interface; and the third stage covers the period after receipt. Loss can be caused by the introduction of faulty information at any one of these three stages. Following the general principles of maximum efficiency in risk allocation, it would seem that with only a few exceptions[63] the sending bank should bear risk at stage 1, the receiving bank at stage 3, and the network at stage 2.

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essentially a sale of services). The essential nature test has been effective in explaining the divergent treatment in dealing with liability for infected blood used in transfusions between hospitals and commercial blood banks. *Compare* Slonecker v. St. Joseph's Hosp., 233 F. Supp. 105 (D. Colo. 1964) (hospital not strictly liable) *with* Reilly v. King County Cent. Blood Bank, 6 Wash. App. 172, 492 P.2d 246 (1971) (commercial blood bank is strictly liable).

Tests devised by courts in this respect remain inadequate to resolve the problem of whether to apply strict liability for the type of transaction involved in interbank fund transfers. The unique ability of the participants involved in fund transfers to spread losses at certain stages, however, suggests that the standard of liability should be based directly on the ability to spread losses rather than analogies to metaphysical distinctions between products and services. Such distinctions are becoming less meaningful and more difficult to support as computer technology and the modes of marketing it advance.

59. Telephone conversation with John F. Lee, Executive Vice-President of New York Clearing House Association, Oct. 16, 1981.

60. *See, e.g.,* CALABRESI, THE COST OF ACCIDENTS 250 (1972). Professor Calabresi notes that accident costs should be allocated in "such a way that errors in allocation will be corrected in the market. This criterion assumes that despite transaction costs, a tendency exists for the market to find the cheapest cost avoider and influence him by bribes. It therefore urges us, to the extent we are unsure who the cheapest cost avoider is, to charge accident costs to that loss-bearer who can enter into transactions most cheaply." *Id.* at 150.

61. The message switching system is probably in the best position to discover where most of the errors introduced into a system have arisen. SWIFT, for example, uses 13 different trailers that record the history of a message as it is transmitted. Its DLM trailer, for example, indicates whether delivery of a message that the receiving bank has received has been delayed for some reason. Its PDM trailer, on the other hand, is added if the system believes that it is possible that the receiving bank has already received a duplicate message. SWIFT BROCHURE, *supra* note 14, at 14.

62. L. de Corcelles, the manager of the Caisse Nationale de Crédit Agricole in Paris, has employed a similar breakdown. *See* de Corcelles, *supra* note 17.

63. At times the sending bank will be in the best position to avoid the costs of accidents that arose after the message left its control, because it knows of the error and can take action that will mitigate damages. See, e.g., notes 92–95 and accompanying text *infra.*

B. Error

1. System Originated Error

In fact, neither CHIPS nor SWIFT appear to have adopted the maximum efficiency-cheapest cost avoider principle as the basis for the allocation of all operating risks. Instead, although the sending and receiving banks assume liability for error and fraud they have committed, the systems are not required to assume liability for all losses arising from system error and failure.

The CHIPS Rules, for example, stipulate that the "Clearing House shall not be responsible for any loss in the use of funds resulting from a system error."[64] Since the CHIPS Rules contain no express disclaimer of liability for principal losses, if a court ever interpreted this rule in an instance of principal losses, it should limit the disclaimer to interest losses. CHIPS would then be required to indemnify the injured bank and spread the loss among the participants.[65] If the disclaimer were interpreted to apply to losses of principal, losses arising from system failure could expose individual CHIPS participants to substantial damages. If, for example, a transfer for $5000 is changed by the system into a transfer for $1 million, and the $1 million are withdrawn by the account holder before the receiving bank receives notice of the error,[66] the receiving bank would bear the loss even though it had committed no error.

SWIFT, unlike CHIPS, assumes liability for certain interest losses it causes. SWIFT accepts responsibility for interest losses caused by "SWIFT system or personnel failure,"[67] by messages which, though acknowledged by the system are not delivered and do not appear on SWIFT's undelivered message report,[68] and by its failure to promptly notify members of operating center and regional processor failures.[69] SWIFT has established an "interest loss contingency item" of 20

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64. CHIPS RULES, *supra* note 27, rule 15.

65. A court could make such an allocation under the "operating cost" allocation provision. The CHIPS Rules provide, "All expenses incurred by the Clearing House to operate the system shall be assessed monthly against all participants pro rata on the basis of the total number of messages, including both payment and other types of computer messages, which were sent and received during the preceding month, except that the minimum assessment for any participant shall be $1,250 per month." *Id.* rule 11.

66. *See, e.g.,* Sager and Brooke, *Wanted Pair Say they are Victims of $1.5 Million Computer Error,* Washington Post, June 27, 1981 at B1, col. 1

67. SWIFT USER HANDBOOK, *supra* note 5, § 7, ch. 7, ¶ 1.3(b). *See generally* Note, *New SWIFT Rules on the Liability of Financial Institutions for Interest Losses,* 13 CORNELL INT'L L.J. 311 (1980) [hereinafter cited as *SWIFT Note];* Kutler, *SWIFT Codifies Liabilities,* Am. Banker, June 18, 1979, at 1, col. 3.

68. SWIFT USER HANDBOOK, *supra* note 5, § 7, ch. 7 ¶ 1.3(b).

For a description of the undelivered message report, see note 24 *supra.*

69. *Id.* § 7, ch. 7, ¶ 1.3.

million Belgian francs per year (approximately $475,000)[70] to reimburse system-generated interest losses exceeding 100,000 Belgian francs (~$2,375).[71] This deductible system is combined with penalty charges for invalid claims.[72]

SWIFT has also defined its liability for principal losses more precisely than CHIPS. The SWIFT User Handbook[73] stipulates that SWIFT will be liable for "direct loss or damage sustained by a member or resulting from a claim duly established against a user or member due to" a "negligent act, error or omission by SWIFT in failing to perform the services as set forth in the User Handbook," or in failing to maintain the security procedures outlined in the User Handbook.[74] SWIFT's rules limit liability for "direct loss or damage" to non-recoverable losses of funds representing the principal amount of a transfer message and interest losses associated with such losses.[75] SWIFT expressly disclaims liability for any consequential damages other than interest losses.[76] Moreover, it disclaims liability for the negligence of a user, the lack of cooperation between users, and "a user's failure to follow the procedures in the User Handbook, provided such failure is established as an essential element that caused the loss or damage incurred."[77]

SWIFT's liability for its own errors and omissions is limited to 400 million Belgian francs (~$9.5 million) "for any one loss or series of losses arising out of the same event."[78] In addition, the user accepts the first 800,000 Belgian francs (~$19,000) of any claim against SWIFT for principal losses due to error.[79] In the event of claims for principal losses arising from a single event that affected a number of messages whose total amount exceeds SWIFT's maximum liability, "the amount so claimed shall be apportioned among the participants on the basis of the principle amount of the message for which the

70. The U.S. dollar figures are based on an exchange rate of .02375 dollars per Belgian franc.

71. SWIFT USER HANDBOOK, *supra* note 5, § 7, ch. 7, ¶ 2.3.2. This section provides that if both sending and receiving banks claim to have adhered to the responsibility principles in the User Handbook, and the receiving Bank was "not unjustly enriched as a result of late payment" both banks "shall jointly present a claim to SWIFT on behalf of the Sending Bank," which will receive a reimbursement at the end of the year in the form of a credit.

72. *Id.*, § 7, ch. 7, ¶ 2.3.5. This section provides for a penalty of 30,000 Belgian francs (~$712.50) for claims that are determined to be invalid.

73. SWIFT Board Paper 185 notes that "The contents of [section 7 of the User Handbook] should be considered the formal legal conditions." SWIFT BOARD PAPER 185, *supra* note 3.

74. SWIFT USER HANDBOOK § 7, ch. 7, ¶ 2.2.1.

75. *Id.* ¶ 2.2.2.

76. *Id.*

77. *Id.*

78. *Id.* ¶ 2.2.3(b).

79. *Id.* ¶ 2.2.4(b).

claims have been made."[80] SWIFT's User Handbook contains no provisions for allocating losses in excess of the maximum liability.

At this time, neither SWIFT nor CHIPS has adopted provisions allocating risk of exchange rate fluctuations resulting from delayed payments, though the SWIFT rules for allocating liability for interest losses could easily be applied to such losses.[81]

In sum, neither the CHIPS nor SWIFT rules require the systems to assume liability for all losses of principal resulting from system failure, and only SWIFT requires the network to assume liability for losses of interest resulting from system failure. From the point of view of maximum efficiency, one may question whether the failure to assign to the systems all liability for losses of interest resulting from system failure makes the allocation of risk in both systems optimal.

Absent substantial market distortions[82] and institutional barriers in the systems[83] to implementing change, however, one would expect the parties to allocate risks efficiently in their agreements.[84] One possible justification for certain disclaimers of liability may be based upon the argument that placing the burden of risk upon the system would not necessarily result in any improvement that would reduce the probability of loss. That is, because of the nature of the industry,

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80. *Id.* ¶ 2.2.3.

81. R. Polo, the manager of the international money transfer department of the Banca Commerciale Italiana, for example, advocates redefining provisions concerning responsibility "in order to include . . . the exchange risk." Polo, *The Quality of Today's International Transfers,* in SIBOS 1981, *supra* note 1, at 117. *See also SWIFT Note, supra* note 67.

82. For example, if there are no adequate substitutes to a system, that system or its controlling members may exercise some degree of monopoly power. *See, e.g.,* the observation of H.P. Sättele, a member of the managing board of the Westdeutsche Landesbank Girozentrale in Germany, who notes, "It is already the case today that no international bank can afford to do without the services provided by S.W.I.F.T." Sättle, *Banking for Corporate Clients,* in SIBOS 1981 *supra* note 1 at 21. Agnus Pietrie, a New York representative of Hongkong Bank, made similar observations about CHIPS, noting, "Any bank that isn't a participant is at a disadvantage." Lachica, *supra* note 26. Settling banks with offices in Asia, for example, therefore have a competitive advantage in obtaining customers. Lachica notes, "A link with Chips [*sic*] would enable the Asian institutions to offer quick transfer services comparable to what Chase and Bank of America provide their customers. Other benefits could show up on the balance sheets, including interest earned on deposits that fund-transferring clients leave with their banks." *Id.* Thus, several banks that have applied for CHIPS membership have considered suing the New York Clearing House for delaying their entry. *Id.* The fact that CHIPS clears 90 percent of all international dollar transfers further supports the conclusion that there is an absence of adequate substitutes for CHIPS services. See note 26 *supra.* For a discussion of anti-trust considerations that could be raised *see* Bernard, *Some Anti-Trust Issues Raised by Large EFT Systems* 25 CATH. U. L. REV. 749 (1976).

83. CHIPS' power structure has come under attack. *See, e.g.* Kutler, *Fed May Link Transfer Net to CHIPS,* Am. Banker, Nov. 16, 1979, at 1, col. 4. Philip Coldwell, Federal Reserve Board Governor voiced his "concern that the New York Clearinghouse's interbank payment system may be discriminatory to the vast majority of CHIPS participants who are not members of the New York Clearinghouse Association." *Id.*

84. See note 60 *supra.*

it is difficult to determine meaningful probabilities of losses in the system.[85] As a result, the systems do not have a reliable basis for evaluating the cost-effectiveness of various contemplated preventative measures and thus will be unlikely to make improvements in the system regardless of whether or not they are liable.[86] However, if the systems can approximate the costs more effectively than any of the other participants, they are arguably the best situated of all parties to assume liability for system failure. Furthermore, they are best situated to spend funds necessary to determine precisely where and how system losses are occurring. Also, the fact that the systems assume liability for other types of system-originated losses — notably fraud — suggests that the "incalculability" argument is not actually valid. Presumably, the allocation of risks — and computation of insurance costs — for the losses which the systems will assume involve actuarial estimates similar to those which would be necessitated by the allocation of risks arising from system failure.

At any rate, by failing to allocate liability for many losses resulting from system failure, the CHIPS Rules seem to indicate that where system failure does result in loss, liability should be determined informally on a case-by-case basis. The SWIFT rules, on the other hand, provide for a dispute resolution procedure which gives banks the right to appeal rejected claims to arbitration.[87]

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85. One argument could be that because of a .0000001 probability of error in any transaction, and because transaction values vary between $5,000 and $5 billion, the expected losses will be difficult to predict. Even though an average transaction value might be calculable, the probability of error may well be 5 in 10,000,000 or 5 in 100,000,000 rather than 1 in 10,000,000. These same factors, however, are also present with respect to risks involved in genetic and nuclear technology. Two insurance pools, the American Nuclear Insurers and the Mutual Energy Liability Underwriters, as of June 1979 provided primary liability coverage of $160 million and $30 million as contingent liability coverage. Long & Long, *The Price-Anderson Act and Nuclear Insurance,* INSURANCE L. J. 367, 371–74 (1979). With respect to genetic technology, *see* Engelhardt, *Taking Risks: Some Background Issues in the Debate Concerning Recombinant DNA Research,* 51 So. CALIF. L. REV. 1141, 1146–48 (1978).

In addition, incalculability is no excuse for abdicating responsibility for liability calculations. The refund practice instituted with respect to nuclear energy would certainly be available here as well. As of the fall of 1978, the pools had refunded about two-thirds of the premiums they had received. Long, *supra* at 374. *See also Nuclear Policy Refunds,* Best's Insurance News Digest, July 25, 1977 at 4; *Nuclear Plan Insurers Refund $2 Million for Excellent Safety Record* 82 NAT'L UNDERWRITER 4 (1978). The insurance industry's "Industry Credit Rating Plan" uses the experience of a pool's entire base over a 10-year period to calculate refunds. Long, *supra,* at 374.

86. SWIFT Memorandum, *supra* note 2, at 1.

87. Claims must be presented to the SWIFT Chief Inspector in Brussels within three months of the date on which the message was to have been received by SWIFT. SWIFT USER HANDBOOK, *supra* note 5, § 7, ch. 7, ¶ 4. SWIFT must accept the claim and remit the amount of the claim in question or reject or dispute it within three months after the claim is submitted. If rejected or disputed the claimant may seek arbitration by serving a written notice of its intention to arbitrate within three months. *Id.*

The User Handbook provides that all disputes that go to arbitration "shall be finally settled by a court of arbitration sitting at Brussels, Belgium." *Id.* § 7, ch. 7, ¶ 1. The User Handbook

2. Bank Originated Error

From the perspective of operating efficiency, the sending bank, as cheapest cost avoider, should bear the risk for errors arising prior to a message's release. Similarly the receiving party should bear the risk for errors arising after its receipt.[88] The case law governing bank liability to a customer is consistent with this prescription.[89]

SWIFT has developed a set of rules for allocating liability for interest losses between banks.[90] The sending bank is liable for interest losses resulting from delays if it enters a message in an inappropriate format[91] or if SWIFT fails to acknowledge the transmission of a message.[92] It is also liable if SWIFT acknowledged the message and that message subsequently appeared on the undelivered message report,[93] if SWIFT did not respond to an urgent message,[94] or if the sending bank failed to react promptly to a notification by SWIFT that a bank has failed or that a regional processor or operating center is not functioning.[95]

The sending bank in all of these cases is the cheapest cost avoider. It is in the best position to reduce the probability that messages will be sent out in an inappropriate format. It is also in the best position to take remedial action if SWIFT fails to acknowledge or respond to transmission of a payment message, or if it has received notification that a bank has failed or that a regional processor or operating center is not functioning.

The SWIFT User Handbook also places liability for errors caused by the receiving bank on the receiving bank. The User Handbook allocates liability on the receiving bank if it fails to carry out the

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provides that "the decision of the Court of Arbitration is not liable to appeal or to any other recourse before arbitrators except for correction of material errors appealed for within thirty days following notification of the Court's decision. *Id.* § 7, ch. 7, ¶ 3. The Board of Directors may adopt special rules of arbitration in its discretion. *Id.* § 7, ch. 7, ¶ 5. All matters not provided for by the User Handbook are governed by the Belgian Law on Arbitration. *Id.* § 7, ch. 7, ¶ 6.4.

88. This is in accordance with the well-accepted principle that the party controlling a matter is usually in the best position to avoid its loss or damage.

89. The sending bank is generally considered the agent of the customer. *See* Gage v. Boston Nat'l Bank, 257 Mass. 449, 452, 154 N.E. 74, 75 (1926). It must act in good faith and exercise ordinary care. *Id. See also* Adams v. Bank of Hydro, 239 F. Supp. 987 (W. D. Okla. 1965); Hydrocarbon Processing Corp. v. Chemical Bank New York Trust Co. 247 N.Y.S.2d 42, 20 A.D.2d 344 (1964), *rev'd.* 262 N.Y.S.2d 482, 16 N.Y. 2d 147, 209 N.E. 2d 806 (1965). In addition, although the sending bank may be liable to the customer for error by the receiving bank, *see* Shrewsbury v. Dupont Nat'l Bank, 10 F.2d 632, 634 (D.C. Cir. 1925) the sending bank is entitled to indemnification from the receiving bank for error caused by the receiving bank, see RESTATEMENT (SECOND) OF AGENCY § 428, Comment f (1958).

90. SWIFT USER HANDBOOK, *supra* note 5, § 7. *See also* SWIFT *Note, supra* note 67.

91. SWIFT USER HANDBOOK, *supra* note 5, § 7, ch. 2, ¶ 5(d).

92. *Id.* ¶ 5(a).

93. *Id.* ¶ 5(b).

94. *Id.* ¶ 5(d).

95. *Id.* ¶ 5(e).

payment date instructions in the message,[96] to react to system messages promptly,[97] to reconcile incoming messages according to sequence numbers,[98] or to follow SWIFT's terminal connection policy.[99] These provisions, like those regarding sending bank liability for interest losses resulting from delays, are consistent with the principles of efficient risk allocation. Although SWIFT's allocation of liability between banks is limited by the terms of the User Handbook to interest losses, from a cheapest cost avoider perspective these principles should be applicable to other losses as well. In fact, a SWIFT Board Paper concurred in this assessment.[100]

The CHIPS operating rules, on the other hand, contain a substantially less extensive allocation of risk between banks. The rules provide that any loss resulting from system error "shall be settled directly between the participants involved."[101] In addition, the rules provide that the sending bank will be liable for losses resulting from a message sent without beneficiary account identification or reference data if the receiving bank completes it as required under the CHIPS Rules.[102]

The CHIPS Rules also provide that the Council on International Banking Rules (CIB Rules) for the adjustment of payments made in error shall apply to CHIPS transfers.[103] Although these Rules do not apply to the recovery of lost principal, they do contain provisions governing compensation for the lost availability of funds in specific circumstances and principles for resolving other claims.[104] The CIB Rules permit an erring bank to request another member to back value

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96. *Id.* ¶ 6(a).

97. *Id.* ¶ 6(b).

98. *Id.* ¶ 6(c).

99. *Id.* ¶ 6(d).

100. SWIFT BOARD PAPER NO. 185, *supra* note 3.

101. CHIPS RULES, *supra* note 27, rule 15.

102. *Id.* rule 10.

103. NEW YORK CLEARING HOUSE ASSOCIATION, CHIPS ADMINISTRATIVE PROCEDURES, ADMINISTRATIVE PROCEDURE NO. 2, ERRORS OTHER THAN SYSTEM CAUSED, *adopted* Oct. 29, 1970. *See* COUNCIL ON INTERNATIONAL BANKING, INTERBANK COMPENSATION RULES (1980) [hereinafter cited as CIB RULES]. Article II, ¶ 1, provides, "The rules apply to all payments, to and from, foreign customers in U.S. dollars, whether made by check, CHIPS, book transfer or Federal Funds transfer." Article II ¶ 2 limits the application of the rules to "Members of the Council on International Banking including their overseas branches." *Id.* art. II, ¶ 2. The rules do not cover errors caused by CHIPS or any other third parties. *Id.* ¶ 3. Finally, "[t]o be *fully* honored, a claim must be initiated within 180 days of the original transaction date," and "[c]laims initiated after one year from the original transaction date need not be honored." *Id.* ¶¶ 4,5.

104. The CIB RULES provide that:

The rules govern compensation for lost availability [of funds] and do not apply to recovery of lost principal. Not every possible error situation is explicitly discussed. When an exceptional situation is encountered, it is expected that the resulting claim will be settled within the framework provided by this document, and in the spirit that no member shall be unjustly enriched or injured as the result of an error by another member.

Id. art. I (emphasis in original).

payment made for a foreign account.[105] Although the CIB Rules place the risk of mistake squarely on the sending bank,[106] they also require that the receiving bank "make the requested back valuation after *timely* verification of the facts contained in the [sending bank's] request, and upon receipt of correct compensation. . . ."[107] In addition, the CIB Rules provide that if one member pays another member in error, the receiving bank must return the funds to the paying bank once it receives proper indemnification.[108] If the receiving bank fails to act within two business days after it receives the guarantee, interest begins accruing to the requesting bank at the rate of 100% of the principal amount.[109] Finally, the CIB Rules provide for the adjustment of payments for credit to the wrong account.[110] Thus, although CHIPS provides some procedures for adjusting erroneous payments between banks, its provisions allocating liability are not as extensive as SWIFT's.

If error originates in the hardware or software of more sophisticated interfaces to the networks, and those programs or components are supplied by the system,[111] allocating the loss to the sending bank where the error was introduced into the payment message may not be the most efficient allocation of risk. The system may then be in a better position to implement improvements and prevent loss and

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105. This rule covers the request of one member to another "to back value payment made for credit of an account because of mistake on the part of the first member. . . ." *Id.* art. III.

106. The CIB Rules require that the request contain an expression of "*an error or omission on the part of the bank requesting the adjustment* and agreement to pay proper compensation (minimum $50) as defined below to the receiving bank." *Id.* art. III (emphasis in original). For errors of less than 4 business days the interest payment equals the principle times the Federal Funds rate times the number of days, divided by 360. For errors longer than 3 business days, the interest payment equals the principal times the compensation rate, which is the average of the Federal Fund rate for the period during which the error occurred plus 1/2%. *Id.* art. III, ¶ 3.

107. *Id.* art. III, ¶ 2 (emphasis in original).

108. *Id.* art. IV (which provides "Such indemnification may be in the form of an authorized message requesting the receiving bank to debit the account originally credited in error, and to return the funds to the paying bank."). In addition, the receiving bank must "compensate the paying bank for the value of the funds *while they remained on deposit at the receiving bank*." *Id.* (emphasis in original).

109. According to article IV, "To expedite return of the principal under the guarantee, interest at the rate of 100% of the principal . . . will accrue to the requesting bank beginning the 3rd business day following receipt of the guarantee." *Id.* art. IV.

110. The CIB Rules provide that the "receiving bank will, upon receipt of notification, adjust the beneficary of the payment on its books. If the receiving bank had use of the funds during the period of the error, it will adjust the value date of the transaction to the original transaction date upon receipt of proper compensation. . . ." *Id.* art. V.

111. The SWIFT Interface Device (SID) is manufactured by Burroughs General Automation and ICL. SID Software was originally produced by these companies but is now "supplied, maintained and developed by SWIFT." SWIFT BROCHURE, *supra* note 14, at 18.

The CHIPS Rules provide that CHIPS will supply a standard program to all participants and that the Executive Vice-President of the Clearing House must approve any changes prior to their implementation. CHIPS RULES, *supra* note 27, rule 6.

therefore should bear the risk of losses arising from such errors. Both systems appear to disclaim liability for damages arising out of such failures though SWIFT provides that banks will benefit from any warranty provisions running to SWIFT.[112]

C. Fraud

Although fraud and error may at times be difficult to distinguish, informed bankers no longer doubt that computer crime has developed into a huge problem.[113] Nonetheless, there is currently substantial variation in the stringency of the security procedures that banks require.[114] The current CHIPS and SWIFT rules, however, do not interfere with the principle that liability for fraud occurring at a bank

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112. SWIFT passes on the benefit of any warranty that may cover certain equipment SWIFT supplies. *See* SWIFT USER HANDBOOK, *supra* note 5, § 7, ch. 7, ¶ 7. It expressly disclaims any "other warranties express or implied." *Id.*

113. A statistical study extensively documenting the problem in federal programs was conducted by the General Accounting Office. General Accounting Office, *Computer-Related Crimes in Federal Programs, reprinted in* STAFF OF SENATE COMM. ON GOV'T. OPERATIONS, 94TH CONG., 2D SESS., PROBLEMS ASSOCIATED WITH COMPUTER TECHNOLOGY IN FEDERAL PROGRAMS AND PRIVATE INDUSTRY, 71–91 (Comm. Print 1976).

The Stanford Research Institute study of computer crime, which produced three reports to the National Science Foundation—D. Parker, S. Nycum & S. Oura, Computer Abuse (Stan. Research Inst. Rep. 1973); D. Parker, Computer Abuse Assessment (Stan. Research Inst. Rep. 1975) and D. Parker, Computer Abuse Perpetrators and Vulnerabilities of Computer Systems (Stan. Research Inst. Rep. 1975)—estimated the annual loss per incident at $300 million at the time of the studies and projected increases at an alarming rate. Though the Stanford Research Institute Study has received some criticism recently, *see. e.g.,* J. Taber, *A Survey of Computer Crime Studies,* 2 COMPUTER L. J. 275, 287–310 (1980), the problem continues to receive substantial attention. The Justice Department completed a report on computer crime, NATIONAL CRIMINAL JUSTICE INFORMATION AND STATISTICS SERVICE, LAW ENFORCEMENT ASSISTANCE ADMINISTRATION, U.S. DEPARTMENT OF JUSTICE, COMPUTER CRIME, CRIMINAL JUSTICE RESOURCE MANUAL (1979).

Legislation has been introduced in the United States Congress, *see. e.g., Computer Systems Protection Act: Hearings On S.240 Before The Subcomm. On Criminal Justice Of The Senate Comm. On The Judiciary,* 94th Cong., 2d Sess. 59–64 (1980). A number of states have enacted statutes, *see, e.g.,* ARIZ. REV. STAT. ANN. §§ 13-2301, 13-2316 (Supp. 1978); CAL. PENAL CODE § 502 (West Supp. 1980); COLO. REV. STAT. §§ 18-5.5-101, 18-5.5-102 (Supp. 1979); FLA. STAT. ANN. §§ 815.01–815.07 (Supp. 1970); ILL. ANN. STAT. ch. 15, § 1, ch. 16, § 9 (Smith-Hurd Supp. 1979); MICH. STAT. ANN. § 28.529 (Supp. 1980); N.M. STAT. ANN. § 30-16A (1981); N.C. GEN. STAT. §§ 14-453–14-457 (Supp. 1980); R.I. GEN. LAWS § 11-52 (Supp. 1979); UTAH CODE ANN. §§ 76-6-701–76-6-704 (Supp. 1979); VA. CODE § 18.2 (Supp. 1978).

Although there are many other facets of computer crime, the problem of fraud in EFT systems, including interbank transfers, is well documented. *See e.g.,* Flato, *EFT and Crime,* Computer Decisions, Oct. 1975 at 30; Hollie, *Police Recount Theft by Wire of $10 Million,* N.Y. Times, Nov. 8, 1978, at A11, col. 1; Menkus, *Computer Crooks May be Robbing Your Bank Blind,* Bankers Mag., May, 1979, at 35; Parker, *A Look at Computer Fraud and Embezzlement in Banking,* Bank Admin., May, 1976, at 18; Schultz, *Bank's DP Consultant Held in $10.2 Million EFT Heist,* Computerworld, Nov. 13, 1978, at 1, col. 3; Schultz, *Ex-Controller Admits Guilt in $140,000 Fedwire Theft,* Computerworld, Aug. 14, 1978, at 1, col. 3; Sager and Brooke, *Wanted Pair Say they are Victims of $1.5 Million Computer Error,* Washington Post, June 27, 1981, at B1, col. 1.

114. SWIFT Memorandum, *supra* note 2, at 2.

should be placed on that bank. The CHIPS Rules, for example, stipulate that "[a]ny loss incurred due to fraudulent transfer originating at a participant shall be borne by such participant."[115]

CHIPS and SWIFT have also adopted different means of ensuring system security. SWIFT encrypts all messages, while CHIPS does not. However, the CHIPS Rules require that all terminals and computers that interface with CHIPS be located in New York.[116] In addition, SWIFT has adopted several software audits[117] and both fund transfer systems control access.[118] The CHIPS Rules adopt the optimal allocation of liability for fraud introduced through the network by assuming responsibility for its occurrence. CHIPS Rules provide that "[a] loss incurred by a participant due to a fraudulent transfer which was initiated by the Clearing House shall be covered by insurance carried by the Clearing House" up to a $25 million limit for each unrelated incident.[119] If the amount of loss exceeds this coverage, all participants bear the loss pro-rata "on the basis of the average daily number of payment messages which were released and received during the preceding 30-calendar day period."[120]

SWIFT, on the other hand, while it assumes the risk of loss due to fraud by its employees, agents or subcontractors arising out of the operation or maintenance of regional processors, operating centers, communication facilities and transmission lines,[121] disclaims liability for "fraud involving persons not directly or indirectly employed by SWIFT."[122] Thus, SWIFT is not liable for fraudulent transfers introduced by non-SWIFT personnel. In addition, SWIFT limits its liability for fraudulent transfers to one billion Belgian francs (~$23.7 million), but unlike CHIPS, fails to provide a procedure for indemnifying a bank and allocating the costs pro-rata over all participants if the loss exceeds this amount.[123] Although these disclaimers affect only unusual instances of fraud, to create the optimal incentive to prevent fraud SWIFT should bear the risk of fraudulent transfers introduced by non-personnel.

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115. CHIPS RULES, *supra* note 27, rule 16(a).

116. *Id.* rule 7. For a discussion of the problems involved in encryption *see e.g.* T. FERGUSON, PRIVATE LOCKS, PUBLIC KEYS AND STATE SECRETS: NEW PROBLEMS IN GUARDING INFORMATION WITH CRYPTOGRAPHY (1981).

117. See note 61 *supra*.

118. SWIFT, for example, incorporates the "principal of dual responsibility to access, occupancy and authorization policies and procedures." SWIFT BROCHURE, *supra* note 14, at 5. The operating centers and regional processor centers both have limited access. In addition, SWIFT restricts employees to their own "work zones." *Id.*

119. CHIPS RULES, *supra* note 27, rule 16(b).

120. *Id.*

121. SWIFT USER HANDBOOK, *supra* note 5, § 7, ch. 7, ¶ 2.2.1(c).

122. *Id.*, ¶ 2.2.2.

123. *Id.*, ¶ 2.2.3(a).

In general, the allocation of liability for fraud contained in the CHIPS and SWIFT rules appears to be consistent with the prescriptions for allocating liability on the cheapest cost avoider basis. But SWIFT should bear the risk of loss caused by fraudulent activities altering information in messages after release from the sending bank and before receipt by the sending bank.

D. *Failure to Settle*

Losses may occur when a bank fails to settle. The inability to settle is generally the result of bank failure.[124] In terms of the proper allocation of risk, the problems presented by the failure to settle may vary depending upon whether settlement is effectuated by a correspondent relationship as in SWIFT or by a settlement system such as CHIPS.

In a correspondent relationship, if a correspondent bank extends credit to a sending bank, the amount of its potential exposure is well defined: it is the amount of credit it has extended. In a settlement system such as CHIPS, however, the risk that one of the participants will be unable to settle is compounded by the fact that one participant's failure may affect many subsequent transactions since transfers are made in reliance on expected previous transfers.[125] Although CHIPS

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124. For example, when the Bankhouse I.D. Herstatt of Cologne failed on June 26, 1974, it owed dollars on the same day for purchases of deutschemark (DM). The German correspondents of the settling banks had debited the DM accounts of the selling banks and had transferred the funds to Herstatt through the Landes-Central Bank—the Bundesbank clearinghouse. However, while Herstatt had been credited with the funds, the selling banks failed to receive dollars through the London or New York clearing houses. The Herstatt failure had a major impact on CHIPS' subsequent development and prompted the move to same-day settlement. See note 126 *infra*. After the Herstatt failure, use of CHIPS dropped dramatically, from a volume of about $70 billion to $20 billion. As Martin Mayer has noted, "The problem was that after Herstatt, no bank was so willing to commit itself to payments without better evidence than CHIPS had provided in the past that the receipts to match those payments, promised by a remote participant . . . were really a sure thing." Mayer, *supra* note 2, at 362. CHIPS initial response to Herstatt was to adopt a special emergency rule on July 1, 1974, which permitted banks to cancel payments up to one day after they were sent. This procedure remained in effect until November 13, 1974. The clearest remedy, however, was reducing credit risks by eliminating the overnight risk inherent in next-day settlement by moving to same-day settlement.

For a discussion of the Herstatt failure, *see, e.g.*, Becker, *International Insolvency: The Case of Herstatt*, 62 Am. Bar Ass'n J. 1290 (1976); Tyson, *Some Banks Escape Damage in Herstatt Failure While Others Suffer Losses in Millions*, Am. Banker, Jul. 19, 1974, at 1, col. 2.

For a discussion of the risks of bank failure, *see, e.g.*, Altman and Sametz, Financial Crises: Institutions and Markets in a Fragile Environment (1977); Horvitz, *Bank Risks in the New International Monetary System—Lessons from Bank Failures*, in The Emerging International Monetary Order and the Banking System 145 (Aharoni. ed. 1976); Mayer, *Should Large Banks be Allowed to Fail?*, 10 J. Financial & Quantitative Analysis 603 (1975); Spero, The Failure of the Franklin National Bank: Challenge to the International Banking System (1980).

125. Kutler, *CHIPS Faces Crucial Policy Issues Amid Regulatory Scrutiny*, Am. Banker, Feb 1, 1979, at 1, col. 1. (claiming that the CHIPS dollar "moves" 50 to 100 times in a day.)

has significantly reduced the amount of time participants are exposed to the risk that a participant will not settle, by moving from next-day to same-day settlement, the risks on banks remain substantial.[126] If a participant bank fails, the funds sent to the Federal Reserve may be inadequate to satisfy other banks' claims. Thus, since the Federal Reserve does not assume risk of bank failure from a private settlement system,[127] some bank or banks in the system will necessarily bear the risk associated with the unsatisfied debits. In the instance of a foreign exchange contract, for example, if a New York bank's foreign payment is cleared before the foreign bank's CHIPS payment is settled and the foreign bank fails in the interim, the New York bank will bear the loss.[128]

Figures 3 and 4 illustrate a simplified version of the CHIPS tranactions occurring in one day.[129] On that day, there are a total of eight transactions among four banks. At the end of the day, Banks A and B are in net debit positions and Banks C and D are in net credit positions. If Bank A fails on that day, its failure to settle creates a shortfall of $14 billion. The responsibility for this failure to settle

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126. Mayer, observes that:

> the major credit risks are borne by the seven largest New York clearing banks, which act as correspondents for the others in settlements, and are thus the most likely to be left holding the bag if "Banco Banco" becomes Banco's ghost.

Mayer, *supra* note 2, at 362. Moving to same-day settlement removes the banks' exposure to overnight credit risks, but still leaves them with substantial "daylight" exposures. These banks would like to set limits on the size of transactions non-settling participants may send through CHIPS, but when such a suggestion was proposed in 1978 it produced violent reactions on the part of the Edge Act subsidiaries participating in CHIPS. *Id.*

Moving to same-day settlement, however, was clearly an important event to the United States banking industry. Thomas Sloane, the senior vice president in charge of management planning at the FRB-NY, describes the move as "a major step with major implications for banks in Western Europe and banks here." *Id.* at 358. Mayer predicts that the result of the move will be that "the velocity of money will soar and some basic U.S. banking practices will never be the same." *Id.*

In addition, before same-day settlement banks had the whole night to find money to clear debits. With same-day settlement, the time for locating money for clearing debit positions has been shortened considerably.

127. Regulation J provides that "except as herein provided, a Federal Reserve Bank shall not be liable for the insolvency, neglect, misconduct, mistake or default of another bank or person, including a transferor." Federal Reserve Board, Regulation J governing the Transfer of Funds, 12 C.F.R. § 210.64 (1981). In addition, the CHIPS Settlement Agreement provides that in consideration of the FRB-NY providing the settlement service, each Settling Bank will indemnify and hold the FRB-NY harmless from any expenses it suffers resulting from its acts or omissions in connection with the settlement arrangement, except for losses resulting from certain stipulated causes. *See* CHIPS Settlement Agreement, *supra* note 38, ¶ 9. See also notes 143–47 and accompanying text *infra*.

128. For a discussion of the Herstatt failure which involved losses arising from foreign exchange contracts, see note 124 *supra*.

129. These figures were inspired by course materials prepared by Professor Scott, Harvard Law School.

Figure 3

Transaction No.	Sending Bank	Receiving Bank	Amount
1	A	B	$11 billion (b)
2	A	C	10 b
3	B	A	6 b
4	B	C	5 b
5	B	D	4 b
6	C	A	1 b
7	C	B	1 b
8	C	D	1 b

Figure 4

Transaction No.	Bank A	Bank B	Bank C	Bank D
1	− 11b	+ 11b		
2	− 10b		+ 10b	
3	+ 6b	− 6b		
4		− 5b	+ 5b	
5		− 4b		+4b
6	+ 1b		− 1b	
7		+ 1b	− 1b	
8			− 1b	+ 1b
NET BALANCES	− 14b	− 3b	+ 12b	+ 5b
BANK A FAILS:				
DELETION	—	− 8b	+ 3b	+ 5b
UNWIND	—	+ 1b	− 2b	+ 1b

could be allocated in a variety of ways, two of which will be discussed in the text.[130]

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130. Five schemes for allocating liability have been outlined by Seymour Rosen, Vice President, Citibank. *See* Outline of Remarks by Seymour Rosen on the Bankwire Settlement System at the 1981 Electronic Funds Transfer Association Conference on Legal Issues in EFT (Jan. 12, 1981) (unpublished memorandum on file at the Harv. Int'l L. J. library) [hereinafter cited as Rosen Remarks]. Mr. Rosen identified these as: (1) the total unwind (discussed in the text), (2) the partial unwind—unwinding transactions only after the bank's failure, (3) spreading losses over all banks that were to receive credits from the failed bank, (4) spreading losses over all net creditor banks, and (5) allocating the loss over all banks having a business relationship with the failed bank. The partial unwind would affect fewer transactions than the complete unwind. The drawbacks of the partial unwind are similar to those of the total unwind discussed in the text. In addition, this alternative introduces an element of chance into the operation

One option would be to delete all transactions with the failed bank from the system and to recalculate net positions for all remaining participants. These participants would then be responsible for settling the revised balances. This option places the risk of loss on those banks that received payment messages from the failed bank on the day of failure and does not necessarily affect other banks. (See Bank D in Figure 4.) Deletion, however, could cause the failure of a second bank — Bank B, for example — if that bank, expecting to cover its net position with credits from the failed bank (Bank A) ordered additional payments.[131] Bank B's failure would then affect still further banks.[132]

A second approach would be to unwind all the transactions of the day on which the bank failure occurred. Banks would then have the option of replaying the day's transactions. For example, if Bank B in Figure 4 realizes that it cannot settle an $8 billion debit, it could decide not to replay the transfers of $5 billion to Bank C and $4 billion to Bank D. The new net positions would then be represented by the last row of figures in Figure 4. Although this approach preserves the options of all banks, it is likely to delay or completely cancel some payment messages, thereby exposing some banks to potential liability to customers for the resulting damages. In addition, the reversal of so many transactions results in a large number of adjusted entries. This adjustment can cause considerable disruption, particularly when a large number of transactions are involved and the number of net balances related to the uncovered transaction is small.[133]

The CHIPS Rules provide that in the event that a participant is unable to settle, "the payment messages released and received by such participant will be deleted and a revised net net balance determined for all other participants."[134] After deletion CHIPS sends a "revised trial balance report"[135] to all other participants. In addition, each

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of the settlement system that might cause some banks to limit their use of the system later in the day, when it is most needed. *Id.* Spreading losses among all banks that had a business relationship with the failed bank is likely to affect banks that had no activity with the failed bank on the day of failure. *Id.* Allocation over net creditors, though somewhat different from the deletion alternative discussed in the text, has a similar effect.

131. This would be the case if Bank B does not have assets to cover its debit position of $8 billion. See Figure 4 at p. 645, *supra*.

132. If Bank B failed, Bank C's credit position of $3 billion would be converted into a debit of $1 billion. See Figure 4 at p. 645, *supra*.

133. Bank D in Figure 4, for example, was affected even though it had no transactions with the failed bank. *See* Rosen Remarks, *supra* note 130 (discussing the disadvantages of spreading losses over net creditors.)

134. CHIPS RULES, *supra* note 27, rule 13(b). The deletion of the messages, however, does not relieve a participant from its "unconditional obligation to make payment in accordance with its payment messages." *Id.* rule 13(e).

135. The trial balance report is "a report sent to a participant consisting of the total dollar amount of payment messages sent by such participant, the total dollar amount of payment messages received by such participant, and the net net balance." *Id.* rule 1(g).

settling participant receives the revised net net balance of each participant for which it settles.[136] The CHIPS Rules grant the Clearing House Committee[137] the "discretion to take such action as it deems appropriate" after consulting with such parties as it deems appropriate.[138] In exercising its discretion the Committee must place "primary emphasis on effectuating settlement."[139] Thus, the deletion alternative described above and illustrated in Figure 4 is clearly permissible under the CHIPS Rules and may be mandated in some instances.

The CHIPS Rules also provide, however, that even though the focus of the Committee's attention should be to effect settlement, it is authorized to return all payment messages to storage, thereby enabling the participants to delete the messages and free themselves of the obligation to settle those transactions.[140] Thus, if a participant's financial soundness is threatened by requiring settlement on revised net net balances, the Committee can avoid these consequences by implementing a complete unwind. The language of the CHIPS Rules, however, appears to limit CHIPS discretion to implement this alternative if deletion will effectively assure settlement without endangering the soundness of the participants. In addition, the Rules prohibit certain other possible allocations of risk by providing that the Committee may not impose liability on any participant in excess of that provided by the CHIPS Rules.[141]

The failure of a CHIPS settling participant would be the bank failure most disruptive to the CHIPS system. In that event, the CHIPS Rules would require the deletion not only of the failed bank's payment messages but also the payment messages of those of its associated participants which were unable to settle its transactions.[142]

Should the Federal Reserve Bank (FRB) suffer any loss from the failure of a participant to settle, the Agreement between the bank and CHIPS provides that the settling banks will indemnify the FRB.[143] That agreement and the CHIPS Rules allocate this loss among the

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136. *Id.*

137. For a description of the Committee, see note 25 *supra*.

138. CHIPS RULES, *supra* note 27, rule 13(b). Presumably banks with substantial changes in their account positions will be consulted by the Committee.

139. *Id.* rule 14(b).

140. *Id.* rule 2.

141. *Id.* rule 14(e).

142. Under the CHIPS Rules, in this event "the Clearing House Committee shall make such arrangements as it deems appropriate with respect to the settlement of the net net balances of any participants for which such settling participant settled, provided that in no event may it impose upon any participant any liability in excess of that otherwise provided by these rules." *Id.* rule 13(d). For these participants, the problem of finding a settling participant willing to assume the credit risk of settling on their behalf, is of course, compounded if all of their funds in New York were with the failed bank.

143. CHIPS Settlement Agreement, *supra* note 38.

settling banks in proportion to the total average daily CHIPS usage of each settling bank and all participants for which it settles.[144] Each settling bank may recover from its participants in proportion to that participant's contribution to the average daily CHIPS usage on which the settling bank paid.[145] Although these provisions allocate the risk of failure to settle if the FRB suffers a loss, according to the agreement these allocation provisions do not otherwise affect the allocation of the risk of failure to settle among participants.[146] As long as adjustments are made before CHIPS sends a balanced net settlement report to the FRB-NY this risk will not arise.[147] Apparently it is within the Committee's discretion, however, to impose this allocation if CHIPS forwards an unbalanced net settlement report to the Federal Reserve and that bank makes payments. This allocation of risk would spread losses most evenly though it has no relationship to whether a bank made payments for a failed bank.

III. JUDICIAL TREATMENT OF RISK IN ELECTRONIC FUND TRANSFERS

Absent a legislative declaration to the contrary, the courts should not impose rules of law which favor one payment system over another.[148]

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144. *Id.* ¶ 9. CHIPS RULES, *supra* note 27, rule 14(e). The total average daily CHIPS usage is defined as the average daily number of payment messages released and received during the 30 calendar day period preceding the shortfall. Thus, the settling bank is liable for the shortfall multiplied by the proportional use of the settling participant and its associated participants. *Id.*

145. *Id.*

146. The CHIPS Settlement Agreement provides, "Nothing herein shall be deemed to affect the rights of the Settling Banks or the Clearing House against each other or the rights of the Settling Banks or the Clearing House against CHIPS participants." CHIPS Settlement Agreement, *supra* note 38, ¶ 9.

147. A balanced net settlement report will not create any claim on the part of the FRB that would require indemnification. Mayer claims that "As the system [CHIPS Same-Day Settlement] matures without failures to settle, everything will, as usual, loosen up, making the FED even more significantly (but less visibly) an insurer of last resort." Mayer, *supra* note 2, at 366.

148. SCOTT, *supra* note 54, at 40. Professor Scott notes that there may be a need for a comprehensive payment code which treats similar transactions in a like fashion so as to eliminate artificial legally imposed advantages of one payment system over another."

This policy is reflected in the recent changes in the Federal Reserve Wire Transfer System's pricing policy mandated by the Depository Institutions Deregulation Act of 1980, Pub. I. No. 96-221, 94 Stat. 132 (codified in scattered sections of 12, 15 U.S.C.). The Board published a set of pricing and schedule fees for certain Federal Bank services effective on Jan. 29, 1981, 46 Fed. Reg. 1338 (1981).

The principles set forth in the Act require that the Reserve Bank services covered by the fee schedule be available to nonmember depository institutions at the same fee schedule applicable to member banks (although the Board may subject nonmembers to other terms). In addition, fees must be established on the basis of all direct and indirect costs. 12 U.S.C. 148a(e) (Supp. 1981). Moreover, the Act requires that the Federal Reserve's fees take into account the return on capital and taxes that would have been paid if the services had been provided by a private firm. *Id.*

The Board has set this "Private Sector Adjustment Factor" at 16%. *See* 45 Fed. Reg. 58,689

Moreover, to the extent possible, the courts should play a clarifying rather than an obfuscating role in developing electronic fund transfer law. Unfortunately, as the following discussion of the judicial pronouncements concerning consequential damages and final payment in electronic fund transfers reveals, the courts have not always achieved either goal.

A. *Liability for Consequential Damages*

In the few instances courts have dealt with damages in wire transfer cases they have limited the amount of recovery for loss resulting from delay or failure to perform a fund transfer to the amount paid under the transfer agreement[149] or the value of the foreign currency credit at the time of breach,[150] plus interest. The District Court for the Northern District of Illinois, however, in *EVRA Corp. v. Swiss Bank Corp.*[151] recently awarded damages exceeding two million dollars to a Charter party which had attempted to pay $27,040.62 on its contract by wire.[152] The Charter party had lost its rights to a time charter as a result of Swiss Bank Corporation's failure to order payment to an account at the Banque de Paris et des Pay Bas (Suisse) S.A. in Geneva.[153] The damages consisted primarily of earnings the plaintiff would have made had the charter continued.[154]

(1980); 46 Fed. Reg. 1,338 (1981); 467 Fed. Reg. 20,298 (1981); and 46 Fed. Reg. 37 (1981).

For a criticism of a Reserve policy that favors either one network or one payment system over others, *see. e.g.,* Eisenmenger, Munnel and Weiss, *Pricing and the Role of the Federal Reserve in an Electronic Funds Transfer System,* in FEDERAL RESERVE BANK OF BOSTON, THE ECONOMICS OF A NATIONAL ELECTRONIC FUND TRANSFER SYSTEM 97, 103–05 (1974) [hereinafter cited as ECONOMICS OF EFT]; Baker, *Competition. Monopoly and Electronic Banking,* in ECONOMICS OF EFT, *supra* at 47, 52–53. For a discussion of the "risk differential" of banks that participate in Federal Reserve bank collection and those that did not, *see* Scott, *The Risk Fixers, supra* note 15, at 737.

149. *See, e.g.,* Richard v. Credit Suisse, 242 N.Y. 346, 353–58, 152 N.E. 110, 112–14 (1926).

150. *See. e.g.,* Richard v. American Union Bank, 253 N.Y. 166, 173–75, 170 N.E. 532, 535 (1930); Richard v. American Union Bank, 241 N.Y. 163, 149 N.E. 338 (1925).

151. No. 73 C 2643 (N.D. Ill., May 12, 1981).

152. EVRA Corp. v. Swiss Bank Corp., No. 73 C 2643 (N.D. Ill., May 12, 1981). The plaintiff, Hyman-Michaels, brought an action against the Swiss Bank Corp. which joined Continental Illinois Bank & Trust (Continental Illinois) pursuant to Fed. R. Civ. Pro. 14(a) as a third party defendant. (Continental Illinois had wired Swiss Bank Corp. on the plaintiff's behalf.) Continental Illinois filed a crossclaim against the plaintiff, for damages for which it might be liable to Swiss Bank Corp. Hyman-Michaels then filed a counterclaim against Continental Illinois for negligence, breach of contract and breach of fiduciary duty.

153. In the *EVRA* case, the plaintiff, Hyman-Michaels had entered into a standard-form time charter with Pandora Shipping Company. The charter provided for semi-monthly payments and gave Pandora the right to withdraw the vessel from Hyman-Michael's service if it failed to pay on time. On April 25, 1973 Hyman-Michaels phoned its bank, Continental Illinois, to make a wire transfer of $27,040.62 to the Pandora Shipping Company's account at the Banque de Paris. Continental Illinois forwarded the order by telex to its London branch. The

Although it based its holding on Swiss Bank's failure to exercise ordinary care, the court did not follow the rule applicable to the payment systems governed by the U.C.C., which excludes consequential damages unless the plaintiff proves bad faith.[155] The court rejected Swiss Bank's argument that the magnitude and character of the plaintiff's injury was not foreseeable. It noted that "The fact that plaintiff was transferring funds by wire rather than through the mails was sufficient to alert Swiss Bank to the importance of the transaction."[156]

By holding that effectuating payment electronically automatically alerts the bank to the importance of the transaction, the court seems to suggest that all consequential damages resulting from electronic transfers should be foreseeable. Carrying foreseeability to this extreme in electronic fund transfer cases is not efficient. Payments made via telecommunication would be priced higher than other types of fund transfers not because they are intrinsically more costly but because courts impose an insurance component not imposed on other payment media.[157]

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telex requested retransmission on to Swiss Bank Corp. which was to retransmit the payment order to the Banque de Paris, where Pandora had an account. Continental Illinois' London branch sent the message to Swiss Bank Corp. and received a reply. Swiss Bank Corp., however, took no action in response to this telex. As a result, Pandora Shipping Co. withdrew its vessel.

The plaintiff alleged breach of contract, negligence and breach of fiduciary duty on the part of the Swiss Bank Corp. The court first noted that "An analogy may be drawn between the concept of 'collecting bank' as found in article 4 of the U.C.C. and the Swiss Bank's role as a correspondent bank." *Id.* It concluded that Swiss Bank Corp. was an agent of the plaintiff and therefore owed it the same degree of care as did Continental Illinois.

In addition the court found that the "Swiss Bank owed a duty of care to plaintiff to maintain a system of receiving and disposing of telex messages upon which plaintiff could rely." *Id.* The court characterized both the use of an automatic answer-back code on the telex, and the failure to institute a system for logging messages as negligent actions. These facts, according to the court, "indicate an appalling lack of regard on the part of Swiss Bank for the more than reasonably foreseeable possibility that the negligent maintenance of its foreign exchange telex machines could result in substantial damage to one of its customers. . . ." *Id.*

154. *Id.* Lost profits accounted for $2,120,804. The court also awarded costs amounting to $16,927.65 that stemmed from prior arbitration.

155. U.C.C. § 4-103(5) provides "The measure of damages for failure to exercise ordinary care in handling an item is the amount of the item reduced by an amount which could not have been realized by the use of ordinary care, and where there is bad faith it includes other damages, if any, suffered by the party as a proximate consequence."

156. EVRA Corp. v. Swiss Bank Corp., No. 73 C 2643 (N.D. Ill. May 12, 1981).

157. Banks of course, should base the charges they impose for services on the true costs they incur. As J. Ehman, President of the Svenska Handelsbanken in Sweden has noted, "The operating costs of international banking and particularly the handling of payments have over the last couple of years been on a constant increase and they tend to increase more rapidly than other costs. Also it is obvious that most of the world's trade represented by our customers cannot increase prices at the same rate as bank charges must increase in order for banks to reach break-even." Ekman, *Serving the Customer—Can We Afford It?*, in SIBOS 1981 *supra* note 1, at 17, 19. Therefore, it is essential that this situation not be exacerbated by imposing rules of liability favoring one payment system over another.

B. *Time of Payment*

In charting the legal rights and responsibilities during the fund transfer process, it is important to establish the time of payment. In addition, two subsidiary questions may affect the rights of participants. First, when does the sending bank become bound to its payment message? Second, when, if ever, may the bank receiving the message to pay refuse to honor the payment request? These questions are crucial because they determine whether a bank has delayed the performance of a transfer,[158] whether a bank assumes certain liabilities in the event of bank failure, and what a bank's responsibilities are if funds are attached.[159]

The courts have not adopted a consistent definition of "time of payment." They have held "time of payment" to be the time at which a transfer message is released by the sending bank,[160] the time at which the receiving bank receives the message,[161] the time at which the receiving bank enters the credit to the payee's account in its books,[162] and the time at which the payee receives notice of the credit.[163] But, in the context of the CHIPS and SWIFT systems, this failure to adopt a consistent definition of "time of payment" may be offset if the courts are willing to uphold the system agreements regarding when payment is final. So far, this issue — whether a court will uphold the agreements of an electronic funds transfer network regarding the time when payment is final — has appeared in one case,[164] *Delbruek & Co. v. Manufacturers Hanover Trust Co.*[165] The court found that the practices associated with the transactions constituted

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158. This question becomes particularly important when a contract specifies a time of payment. *See, e.g.,* EVRA Corp. v. Swiss Bank Corp., No. 73 C 2643 (N.D. Ill. May 12, 1981); Tenax S.S. Co. v. The Brimnes, [1973] 1 All E.R. 769 (Q.B. 1973).

159. If payment is final a bank may not permit withdrawal of transferred funds. *See* Buffalo Insulation Distrib. v. Marine Midland Bank (N.Y. Sup. Ct., Apr. 11, 1972), *cited in Banking Decisions: Wire Transfer Complete Before Bookkeeping Entry,* 89 BANKING L.J. 851 (1972).

160. Delbrueck & Co. v. Manufacturers Hanover Trust Co. 609 F.2d. 1047 (2d Cir. 1979).

161. Buffalo Insulation Distrib. v. Marine Midland Bank (N.Y. Sup. Ct., Apr. 11, 1972), *cited in Banking Decisions: Wire Transfer Complete Before Bookkeeping Entry,* 89 BANKING L.J. 851 (1972).

162. Tenax S.S. Co. v. The Brimnes, [1973] 1 All E.R. 769, 784 (Q.B. 1973).

163. Guaranty Trust Co. v. Lyon, 67 Misc. 334, 124 N.Y.S.2d 680 (Sup. Ct. 1953). For additional discussion of the time of payment, *see* A. Arora, *Future Developments in Money Transfer.* [*1981*] LLOYD'S MAR. & COMM. L. 56 (1981); A. Arora, *Recent Developments in Money Transfer Methods,* [1980] LLOYD'S MAR. COMM. L. 416, 423–26 (1980).

164. The courts have demonstrated a willingness to uphold such agreements in analogous contexts. *See, e.g.,* Westside Bank v. Marine Nat'l Exch. Bank, 37 Wisc. 2d. 661, 155 N.W.2d 587 (1968) (upholding a clearing house rule extending the time for final payment beyond the midnight deadline in the U.C.C.).

165. Delbruek and Co. v. Manufacturers Hanover Trust Co., 609 F.2d 1047, 1051 (2d Cir. 1979).

"conclusive evidence of the legal effect of those transactions,"[166] and upheld the irrevocability of a CHIPS transfer when released.[167] Thus, since both CHIPS and SWIFT bind the sending bank upon release of a message, the first question — when the sending bank is bound — should be easy to resolve.[168]

The second question — when the receiving bank becomes bound to accept a payment order — is not well established either by the systems' agreements or the courts.[169] Although one court has held that a bank is bound upon receipt of a payment message,[170] banks should be granted a limited right to refuse payment in order to enable them to control the credit they extend. It is equally important, however, that this right be restricted to a limited period of time to avoid excessive uncertainty as to the status of payments.[171]

IV. LEGISLATIVE RESPONSES TO RISK IN ELECTRONIC FUND TRANSFERS

Several reasons could justify national or international codification of the rights and liabilities of participants in a fund transfer system. A codification could assure that the law does not favor one payment system over another by imposing a set of uniformly applicable rights and obligations on participants in all payment systems. In addition, such a law could impose efficiency by shifting liability to the cheapest cost avoider in areas where parties fail to do so by private agreement.

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166. *Id.* at 1051.

167. *Id.* at 1052.

168. See note 33 *supra*. SWIFT has also defined several other terms that would facilitate such findings, and further clarify the rights of the participating banks. "Time of Receipt" is precisely defined. *See* SWIFT USER HANDBOOK, *supra* note 5, § 7, ch. 2, ¶ 4.3.1 and § 4, ch. 1, ¶ 1.1.2. The "value date" is defined as the "date when the amount of the transfer is at the disposal of the Receiving Bank." *Id.* § 7, ch. 2, ¶ 4.3.2. SWIFT defines the "pay date" as "the date on which the receiving or third Bank is requested to credit or pay the beneficiary customer . . . subject to national convention and exchange control regulations, if any." *Id.* § 7, ch. 2, ¶ 4.3.3. Finally, "cutoff time" is defined as "the latest time of day (by country/ time zone) for Receiving Banks to apply same day value to effect transfers in domestic currency in favor of third banks." *Id.* § 7, ch. 2, ¶ 4.3.4.

169. This issue, of course, is distinct from the bank's obligation to its customer to accept payments on his behalf. *See, e.g.*, Tenax S.S. Co. v. The Brimnes, [1973] 1 All E.R. 769 (Q.B. 1973).

170. Buffalo Insulation Distrib. v. Marine Midland Bank, (N.Y. Sup. Ct., Apr. 11, 1972) *cited in Banking Decisions: Wire Transfer Complete Before Bookkeeping Entry*, 89 BANKING L. J. 851, 852 (1972) (an attachment where the court held that the transfer "was complete *upon receipt*" by the receiving bank.) *Id.*

171. *See* Momms and Others (Trading As Delbruek and Co.) v. Barclays Banks Int'l. Ltd., [1976] 3 All E.R. 588 (Q.B. 1976). The court noted that:

Commerce requires that it should be clearly ascertainable by the end of the day whether a payment due to be made on that day has been made or not. Whether this has happened or not cannot be held in suspense until the following morning.

Id. at 598.

Finally, a codification could clarify expectations of liability among participants by supplementing risk allocations not expressly agreed to by the participants.

A. National Responses

Legislation specifically concerning electronic funds transfers has been limited. The United States enacted the Electronic Funds Transfer Act in 1978, but this legislation concerns consumer rights and specifically excludes interbank transfers.[172] Federal regulations dealing with interbank fund transfers are limited to bank use of the Federal Reserve Communications System[173] (FedWire) and the Treasury Department's regulations governing federal recurring payments.[174]

Several states in the United States have also enacted legislation governing electronic fund transfers, but these statutes also generally fail to deal with risk allocation in interbank transfers.[175] Moreover, the present U.C.C. and the electronic fund transfer acts in effect today fail to define the obligations and rights arising from electronic fund transfers among banks and the network.[176]

This gap is the result of the fundamental limitations of these statutes as currently drafted. The electronic fund transfer acts generally deal with consumer rights and bank-branching restrictions. The U.C.C. is based upon the paper "item,"[177] which in electronic fund transfer

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172. Electronic Fund Transfer Act of Nov. 10, 1978, P.L. 95–630, 92 Stat. 3728 (codified at 15 U.S.C. 1693 (1980)). Section 903 exempts interbank fund transfers entirely. Regulation E also provides that the Electronic Fund Transfer Act and regulations pursuant to it do not apply to "Any wire transfer of funds for a consumer through the Federal Reserve Communication System or other similar network that is used primarily for transfers between financial institutions or between businesses." Regulation E, Electronic Fund Transfers, 12 C.F.R. § 205.3 (1980).

173. Federal Reserve Board, Regulation J Governing the Transfer of Funds, 12 C.F.R. § 210 (1981).

174. U.S. Dept. of Treasury Regulations: Federal Recurring Payments Through Financial Organizations by Means Other than Check, 31 C.F.R. § 210 (1981).

175. *See, e.g.*, CONN. GEN. STAT. ANN. §§ 36-193 a–h (West 1981); ILL. ANN. STAT. ch. 16 ½, § 801-100 *et seq.* (Smith-Hurd Supp. 1980); IOWA CODE ANN. §§ 527.1–527.12 (West Supp. 1981); MICH. STAT. ANN. §§ 23.1137(1)–(31)(1981); MONT. REV. CODES ANN. §§ 32-6-101 to 32-6-402 (1979); N.Y. BANKING LAW § 105-a; § 240-a (Consol. Supp. 1980); OR. REV. STAT. §§ 706.005 *et seq.*, §§ 714.200 *et seq.* (1979); UTAH CODE ANN. § 7-16-1 *et seq.* (Supp. 1979). The Permanent Editorial Board of the Uniform Commercial Code is considering a new payments code that would cover interbank electronic fund transfers. *See* PERMANENT EDITORIAL BOARD FOR THE UNIFORM COMMERICAL CODE, NEW PAYMENTS CODE (1981).

176. First Nat'l Bank & Trust v. Georgia R.R. & Trust, 238 Ga. 693, 235 S.E.2d 1 (1977) illustrates the U.C.C.'s inadequacy in providing sufficient guidance for courts to reach an efficient result in certain electronic transactions where an intermediary commits an error while processing an item. In *Georgia Railroad* the payor bank was held liable for damages caused by a check that was underencoded by a collecting bank, even though the collecting bank had caused the error. The Georgia Supreme Court cited to U.C.C. §§ 3-303, 4-303 noting that "[o]nce the check had been acted upon by that bank [the payor bank], its drawer no longer had the authority to stop payment." *Id.*

177. ZIMMER AND EINHORN, THE LAW OF ELECTRONIC FUND TRANSFERS 45 (1981). The

systems is replaced by a stream of electronic data and a series of records.[178] Moreover, the U.C.C. does not provide for liability falling upon systems such as CHIPS and SWIFT because it does not contain any provisions that govern the liability of parties to transfers who are not parties to the instrument.[179] In addition, the U.C.C. fails to allocate risks effectively because rights and liabilities under the U.C.C. often hinge on ascriptive statutes that are difficult to apply to the participants in electronic fund transfers.[180] Thus, Professor Scott has noted that the U.C.C. as currently drafted, "is largely irrelevant to the significant legal problems confronting [electronic fund transfer] systems" and "even if the Code were deemed applicable to various transactions, it would not supply any answers to the most pressing problems, except by analogies or application of its underlying principles."[181]

To the extent that the U.C.C. is applicable to electronic fund transfers, either directly or by analogy, it does mandate deference to the agreements made by the participants in the systems. Article 4 provisions "may be varied by agreement except that no agreement can disclaim a bank's responsibility for its own lack of good faith" or "negligence".[182] The U.C.C. ascribes to "Federal Reserve regulations and operating letters, clearing house rules and the like" the effect of agreements even though they were not assented to "by all parties interested in the items handled."[183] Thus, if the U.C.C. is deemed applicable, it seems to uphold virtually all of the risk allocations embodied in the operating rules of fund transfer systems such as CHIPS and SWIFT.[184] The analogy to these provisions of the

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U.C.C. provides, "'Item' means any instrument for the payment of money even though it is not negotiable but does not include money." U.C.C. § 4-104(g), *Cf.* Clarke, *An Item is an Item is an Item: Article 4 of the U.C.C. and the Electronic Age*, 25 Bus. Law. 109 (1969) (arguing that the U.C.C. is capable of dealing with most EFT issues).

178. ZIMMER, *supra* note 177, at 45.

179. SCOTT, *supra* note 54, at 64. *See also* Girard Trust Corn Exch. Bank v. Brink's Inc., 422 Pa. 48, 220 A.2d 827 (1966).

180. SCOTT, *supra* note 54, at 47–48. Such ascriptive statuses include "holder," "holder in due course," "transferee," "collecting bank," and "payor bank." *See* U.C.C. §§ 3-201, 3-202, 3-301, 3-305, 3-306, 4-207. For an application of the article 4 statuses to a wire transfer see the discussion at note 153.

181. SCOTT, *supra* note 54, at 251–52.

182. U.C.C. § 4-103(1).

183. U.C.C. § 4-103(2).

184. The phrase "Clearing House rules" in U.C.C. section 4-103 apparently covers the CHIPS rules as they are promulgated by the New York Clearing House and govern "the details of clearing." U.C.C. § 4-103, Comment 3.

SWIFT's rules would have to be construed as falling under the U.C.C.'s phrase "and the like" in section 4-103(2). The U.C.C. Comment notes, "Other agencies or associations may be established in the future whose rules and regulations could be appropriately looked on as constituting a means of avoiding absolute statutory rigidity. The phrase 'and the like' leaves open such possibilities for future development." U.C.C. § 4-103, Comment 3.

U.C.C. could, however, be used to impose liability for system error on the systems to the extent that they disclaim liability for negligence and lack of good faith.

Other commercial codes have similarly stopped short of imposing risk allocations between the network participants to any greater extent than the U.C.C.[185] These codes contain many of the same conceptual weaknesses present in the U.C.C. when applied to fund transfers, and thus fail to enhance efficiency by serving a supplementary or clarifying role. Nonetheless, the principles that have developed with Giro accounts,[186] which have been incorporated into the law of several European states, already provide a framework through which some disputes in interbank transfers could be resolved in an effective manner.[187]

B. *International Response*

The primary benefit of international codification of rules regarding electronic fund transfers is that such an effort would eliminate uncertainties created by different substantive provisions in national laws.[188] In addition, such a codification could be an effective means of unifying the laws applicable to different payment systems.

The main source of the uncertainty is that there is no single code or law applicable to every transaction. Different nations' laws apply to transfers that originate or are transmitted to different nations although the transfers are otherwise identical. Often, the substantive provisions of several states' laws purport to apply to a single transaction. Thus, the outcome may depend on the forum in which the

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Reading section 4-103 as upholding the SWIFT rules receives further support from U.C.C. section 1-102 which provides that one of the underlying principles and policies of the Code is "to permit the continued expansion of commercial practices through custom, usage and *agreement* of the parties." U.C.C. § 1-102(2)(b) (emphasis supplied).

185. *See, e.g.,* A. Tyree, *Electronic Funds Transfer in New Zealand,* 8 NEW ZEALAND U.L. REV. 139 (1978); Crawford, *Credit Transfers of Funds in Canada: The Current Law,* 3 CANADIAN BUS. L.J. 119 (1979). WECHSELGESETZ, June 1933 (BGB1, IS 753) (Fed. Rep. Germany); for reprints of the major commercial law statutes, *see* DIGEST OF COMMERCIAL LAWS OF THE WORLD (G. KOHLICK ed. 1981).

186. The Giro account is held by a financial institution on behalf of a customer who accepts credits to the account, and orders the bank to make payments on his behalf by debiting his account and crediting the account of the customer's creditor. For a discussion of the automation of one Giro center *see* BANKGIROCENTRALE B.V., ANNUAL REPORT 1980 at 13–18 (1980).

187. *See, e.g.,* Judgment of Nov. 3, 1976, II BGHSt 116/74; Hadding, *Neuere Rechstprechung zum bargeldlosen Zahlungsverkehr* 9 JURISTENZEITUNG 281 (1977); Fries, *Änderung der Aufgaben der Girozentralen* 67 VERWALTUNGSARCHIVE 241 (1976); Fries, *Änderungen der Aufgaben der Girozentralen* (2. Teil) 67 VERWALTUNGSARCHIVE 384 (1976). For a discussion of the interrelation between Giro and electronic fund transfers *see* White, *The Coming Credit: The Developing Electronic GIRO Capability,* Mag. Bank Ad. Dec. 1975 at 34.

188. The failure of most nations to provide clear codifications of the rights of parties participating in electronic transfer transactions creates a substantial risk that different laws will be applied in different jurisdictions. This risk is exacerbated if a court must resort to judicial interpretation of general principles underlying a foreign state's laws.

litigation proceeds. In *EVRA Corp. v. Swiss Bank Corp.*, for example, the Illinois court had to choose between conflicting conceptions of a bank's duty under Swiss and Illinois law.[189]

In addition to conflicting substantive provisions there is even dispute over the principles which should determine the law that is applicable to a transfer in the event of a conflict. Some courts have characterized electronic orders as executory contracts[190] and have held that the governing law is the law of the place where the contract is to be performed.[191] Others have held that the law of the place where the customer paid for the transfer governs.[192]

Clearly, this uncertainty would be most completely eliminated by drafting a code of liability that would be uniformly applicable. To the extent that an international document reduces uncertainty it will result in more efficient outcomes provided that it does not hamper the further development of the technology.[193]

To date no convention on the electronic transfer of funds has been ratified, though the United Nations Conference on International Trade Law (UNCITRAL) has focused substantial efforts on drafting a Uniform Law on International Bills of Exchange and Promissory Notes[194] (Draft), which could affect risk allocation in some system transfers if adopted.[195] Since SWIFT plans to expand the range of services it

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189. No. 73 C2643 (N.D. Ill. May 12, 1981). Under Swiss law, Swiss Bank would not have owed Hyman-Michaels any duty of care because Swiss law requires privity. Illinois law, which the court finally adopted, "does not require privity to establish the existence of a duty." *Id.*

190. Gravenhorst v. Zimmerman, 236 N.Y. 22, 27–34, 139 N.E. 766, 768–70 (1923).

191. Richard v. American Union Bank, 241 N.Y. 163, 166–67, 149 N.E. 338, 339 (1925).

192. American Union Bank v. Swiss Bank Corp. 40 F.2d 446, 540 (2d Cir. 1930).

193. Where technology that could lead to greater efficiency is in a stage of rapid development, aggregate efficiency could be impeded by legal regimes unable to foresee or accommodate new technological developments. This outlook was adopted by the OECD in its guidelines for governing the protection of privacy and personal data. Recommendations of the Organization for Economic Co-Operation and Development Concerning Guidelines Governing the Protection of Privacy and Transborder Flow of Personal Data, O.E.C.D. Doc. C(80)58 (Oct. 1, 1980). These recommendations are purely voluntary. *See, e.g., Transborder Data Flows: Personal Data,* 22 HARV. INT'L L.J. 241 (1981); Note, *Contracts for Transnational Information Services: Securing Equivalency of Data Protection,* 22 HARV. INT'L L.J. 157 (1981).

194. Draft Uniform Law on International Bills of Exchanges and International Promissory Notes, U.N. Doc. A/CN.9/WG.IV/WP.2, (Nov. 21, 1972) (initial Secretariat Draft, with commentary modified as a result of six sessions of the Working Group). *See* Working Group, *Report on the Fifth Session.* U.N. Doc. A/CN.9/141 (1977); Working Group, *Report on Sixth Session.* U.N. Doc. A/CN.9/147 (1978). A revised full text can be found at U.N. Doc. A/CN.9/141 (1977).

195. *See also* Penney, *The Draft Convention on International Bills of Exchange and International Promissory Notes: Formal Requisites,* 27 AM. J. COMP. L. 515, 518 (1979). The Working Group on UNCITRAL has not yet decided whether or not the Draft should cover electronic transmissions. *Id.* (citing Working Group, *Report on Fourth Session,* A/CN.9/117 (1976) para. 76, VII *Yearbook* 143). Professor Penney argues that the Draft is not the "appropriate place" for regulation of electronic fund transfers. Penney, *supra,* at 518.

performs and the volume of messages it transmits even further,[196] the prospect of a substantial volume of electronically created instruments by the time the convention is opened for signature should be considered in its drafting.

The Draft's approach to mistake and fraud appears to be based on efficiency principles, but like some national codes its current provisions lack the specificity required to achieve such a goal. Article 11, for example, seems to be based on the principle that the party which creates an error is liable for it. It provides that if an incomplete instrument is completed in a fashion other than in accordance with agreements entered into by the parties, the "party who signed the instrument after the completion is liable according to the terms of the instrument so completed." Moreover, the "party who signed the instrument before the completion may invoke the non-observance of the agreement as a defense against a holder or against any other person. . . ."[197] The Draft, therefore, would accommodate system rules which allocate liability on the party responsible for the error and the failure to make follow up inquiries. The Draft, however, does not play an effective supplementary role in the absence of an agreement allocating network created error.

The fraud provisions of the Draft are also insufficiently specific to make any significant contribution to network efficiency. Article 22, which is the only article in the current draft dealing with fraud, provides only for rights against the forger himself, and does not purport to allocate the risk of forgery between participants in the creation, transmission and receipt of the instrument absent recourse against the forger.[198]

The generally negative sentiment towards including interbank electronic transfer transactions in the present UNCITRAL Draft has been the result primarily of the fear that such an effort would impose unnecessary and inconvenient delay into the process of adopting a negotiable instruments convention that would replace the Geneva Convention.[199] Professor Penney, for example, noted that "if UN-

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196. *See* Reuterskiöld, *supra* note 1; Kok, *supra* note 32.

197. Draft Uniform Law on International Bills of Exchange and Promissory Notes, U.N. Doc. A/CN.9/141 Annex (1977) art. 11.

198. *Id.* art. 22, which currently provides:

    (1) if an endorsement is forged the person whose endorsement is forged has against the forger and against the person who took the instrument directly from the forger the right to recover compensation for any damage that he may have suffered because of the forgery;

    (2) the drawer or maker of the instrument has a similar right to compensation in circumstances where damage is caused to him by the forgery of the signature of the payee;

199. Convention Providing Uniform Law for Bills of Exchange and Promissory Notes, *opened for signature* June 7, 1930, 143 L.N.T.S. 259, 1 U.N. REGISTER OF TRADE LAW TEXTS 144-80 (1971).

CITRAL is to establish special regulations for electronic fund transfers as normally conducted, this should be accomplished by a separate project or by a set of separate provisions to be added to the Draft at a later time."[200]

However, since a convention could make substantial contributions to the efficiency of a payment systems simply by clarifying the responsibilities beyond the vagaries of some national laws, and adopting a unified approach to risk allocation in all payment systems, this vehicle should be seriously considered. Such a convention could be useful in defining where the boundary lies between risks that can be allocated by the parties and those that should not be disclaimable. Moreover, it could provide for supplementary allocations in the absence of participant agreements. Finally, such a document could define the standards for liability and the scope of damages that would be applicable to all payments systems.

V. CONCLUSION

Regardless of whether risk is allocated by legislation, judicial decisions or private agreements, the same factors of cost avoidance and cost spreading should be considered when structuring an efficient system of risk allocation. To varying degrees, the fund transfer systems, the courts and the legislatures have established some rules that comply with the basic principles of risk allocation. Nonetheless, all appear to have failed to adopt optimal allocations in important areas.

This Comment has postulated a model as a basis for its analysis of risk allocation in electronic fund transfers.[201] This model suggests that generally interbank fund transfers can be divided into three stages — (1) before release of the transfer message by the sending bank, (2) after release of the transfer message and before receipt of the message by the receiving bank, (3) and after receipt of the message by the receiving bank. According to the model, the party "in possession" of the message — the sending bank at stage one, the network at stage two, and the receiving bank at stage three — is usually the most efficient bearer of risk, because that party is presumably the best cost avoider. In addition parties that can avoid or mitigate losses should be obligated to do so or bear the losses even if the error is introduced elsewhere. As noted, however, neither the CHIPS nor SWIFT provisions are entirely consistent with this model, since both systems have opted for substantially limiting the amount of risk that they will bear by disclaiming liability entirely,[202] limiting the amount

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200. Penney, *supra* note 195, at 518.
201. See notes 62-63, and accompanying text *supra*.
202. See notes 64, 76, 81, & 122 and accompanying text *supra*.

for which they are liable[203] or adopting conditions precedent to accepting liability.[204] This Comment has suggested accordingly that the CHIPS and SWIFT allocations of risk may be, from an efficiency standpoint, less than optimal.

However it may be that the underlying model of electronic fund transfers between banks is not entirely valid. One possible objection is that the model implicitly exaggerates the independence of the system from the participating banks, whereas in both CHIPS and SWIFT the system is a creature created and run, to a certain extent, by the participants. Hence, this argument runs, the banks do in fact have the power to implement system changes that will reduce losses, and are therefore the best bearers of losses arising from system action.

This objection is valid to a certain degree. SWIFT's corporate structure accomodates input by all users of the system, and as a result the participants in SWIFT have some control over the way the network is run.[205] Similarly, in CHIPS, although the system's operations are controlled by a small number of settling participant banks, those banks are the parties that bear most of the risks of loss in the system.[206] Still, this degree of control over the systems by potentially liable parties does not make the distribution of the risk of system generated loss on the banks an efficient allocation.

The reason that the present allocations of risk by CHIPS and SWIFT may not result in the most efficient improvements by the systems is that both systems fail to incorporate adequately principles of cost spreading into the calculus of risk allocation. Under the present regime of allocating losses, cost-effectiveness in the system will presumably occur when certain banks arrive at a consensus to implement efficient improvements. However, this consensus may be difficult to achieve if there are parties who prefer the risk of loss over paying for im-

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203. SWIFT limits the amount of liability it assumes for both system error and fraud. See notes 70, 71, 78–80, 119, & 123 and accompanying text *supra*.

204. The most significant of these is a requirement of a showing of negligence before allowing recoveries. See note 74 and accompanying text *supra*.

205. See notes 6–12 *supra*. In fact, SWIFT has adopted a risk allocation more consistent with the efficiency model proposed here, even though its decision-making structure expressly involves all members, suggesting that despite their ability to participate in determining improvements, the SWIFT members perceive that imposing risk of certain losses on the system will lead to more desirable results. The loss prevention services that SWIFT provides are in fact more extensive than those that CHIPS has implemented. See notes 116–18 and accompanying text *supra*. In addition, SWIFT is undertaking a major program of system improvements which includes the replacement of the approximately 60 regional processors currently in service. *See* Cerveau, *The Architecture of S.W.I.F.T.'s Future,* in SIBOS 1981 *supra* note 1, at 13; *Planning for the Future,* Swift Newsletter, May 1981 at 1. In addition, SWIFT plans to improve system redundancy by "triplexing," or installing an additional processor in the operating centers in Holland and the United States. Cerveau, *supra*.

206. See note 126 *supra*.

provements which will eliminate the possibility of certain losses. Risk-taking, then, is ultimately counter-efficient.

Moreover, even if all banks insure against system losses, placing liability on the system for system-caused losses would be likely to be more efficient. A single insurance policy held by the system saves the administrative costs of separately insuring each bank. In addition, an insurance company which insures the entire system may have a greater incentive to encourage the implementation of cost effective improvements than a company which insures only a single bank.

Given that private agreements may not always allocate the risk of loss efficiently, the question remains whether courts and legislatures should assume responsibility for making decisions concerning the allocation of risk, even when this may mean overriding the decisions of the systems. In the judicial context, for example, should courts always follow the *Delbruek* rule, or should courts independently arrive at the efficient allocation in certain instances? Although judicial intervention may at times impose more efficient allocations of risk than those contained in system agreements, the uncertainty that such intervention could introduce concerning the validity of other portions of the systems' agreements might outweigh any efficiency gains that judicial activism might bring about. Perhaps the most effective role the courts and legislatures can play is in supplementing the allocation of risk where private agreements have remained silent,[207] and in ensuring that the legal rules do not favor one payments system over another by requiring that certain legal rules be applicable to every payment system.

Most important, however, many provisions in private agreements could lead to more efficient results simply by clarifying the legal consequences of certain occurrences. Many such provisions have only minimal negotiation costs but can lead to substantial efficiency improvements by clarifying the rights and liabilities of participants.[208] Ultimately, such an approach is the most desirable since it is the simplest and least costly to implement.

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207. See discussion at pp. 648–58 *supra*. In addition, such legislation could be used to create certain evidentiary presumptions to aid in resolving disputes consistently.

208. For example, codifying the responsibilities of banks to route messages in certain manners would make the erring bank's liability clear and thus probably reduce the occurrence of faulty routing of payment messages. *See* Polo, *supra* note 81, at 118–20. Polo suggests that the User Handbook provide examples of the proper manner in which payment messages should be routed, and how cover instructions should be formulated. Another such clarifying provision is a choice of law clause. While SWIFT explicitly provides that Belgian law applies (see note 5 *supra*), neither the CHIPS Rules nor the New York Clearing House Constitution provide that New York law applies. Although the CHIPS Rules require that every participant have an office in New York and that all messages processed by computer be processed in New York, this requirement clearly does not preclude a participant from filing an action in a foreign forum which could be tried under another jurisdiction's laws.