

ELECTRONIC STORED VALUE PAYMENT SYSTEMS, MARKET POSITION, AND REGULATORY ISSUES

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INTRODUCTION

Paper based stored value schemes have been a part of life in the United States for more than 100 years. For instance, the American Express Company, the longest non-bank issuer, began issuing money orders in 1882.¹ Traveler's checks, pre-paid scrip books, and layaway

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1. 8 ENCYCLOPEDIA BRITANNICA 253 (15th ed. 1995).

plans are other representative examples. Stored value as a form of payment has distinct and useful properties when compared to the more commonly used payment forms such as cash, check, credit, and debit. In most cases, stored value serves as a cash surrogate that, although having some limitations on its use, can have advantages over cash. These advantages include: protection from loss or theft (traveler's checks); ability to be sent to a remote recipient (money orders); and pre-payment for goods or services (scrip books and layaway plans).

In the early 1970s, advances in digital magnetic recording technology led to the development of mag-stripe card-based electronic payment systems. The most familiar of these are the ubiquitous automatic teller machines ("ATM") and credit authorization and transaction capture terminals found in many retail stores at the point of sale ("POS"). As a parallel development, albeit on a much smaller scale, entrepreneurial companies—which represented themselves neither as being banks nor as being involved in banking activities—developed electronic stored value systems for various applications. There are two broad divisions in the taxonomy of these systems: off-line and on-line.²

Off-line systems encode information electronically on a magnetic strip or a computer chip and can be used to purchase goods or services.³ The balance recorded on the card is debited at a merchant's POS terminal when a customer makes a purchase or is credited when additional value is placed on the card.⁴ Generally, stored value cards ("SVC") contain all the information necessary to identify the card and its value. This has enabled POS terminals in most systems to be "off-line." In other words, it is unnecessary to contact a depository institution or database for transaction authorization. Examples of off-line stored value systems include photo copier payment cards and prepaid rapid transit system fare cards. These cards are disposable and contain a small amount of value—usually less than twenty dollars. This type of card is treated as a bearer instrument because there is no registration of the card's value with a corresponding owner.⁵ In this

2. See Notice of FDIC General Counsel's Opinion No. 8; Stored Value Cards and Other Electronic Payment Systems, 61 Fed. Reg. 40,490 (1996).

3. See *id.*

4. See *id.*

5. A "bearer instrument" is an instrument that is payable to the bearer by its terms. It is payable to: the bearer or order of the bearer; a specified person or bearer; "cash" or the order of "cash;" or any other indication which does not purport to designate a specific payee. See U.C.C. § 3-109 (1990). The mere possession of the instrument presumes the right to use it without prejudice. The identity of the bearer is immaterial in the context of using the card to make a payment. See *id.*

respect, off-line SVCs are like cash. If a card is lost, the value on the card is irretrievably lost to its purchaser and may or may not be available to its finder. If the lost card has an assigned personal identification number ("PIN"), only the card's rightful bearer can use its value, provided, of course, that the card's finder is unable somehow to determine, or guess, the correct PIN.

On-line systems, on the other hand, use the encoding on the card to identify the unique location of the cardholder's "value store" in a centralized data processing resource. This value store is maintained in an electronic memory register. The card accepting terminal and the centralized data processing resource are connected, either permanently or as required at the time of the transaction, by means of a data communications channel—hence the "on-line" designation. As value is used to make purchases or when additional value is added to the store, the memory register in the unique location is adjusted accordingly. Such cards are similar to debit cards except that the cardholder specifically designates the amount of money that may be accessed through the card, and once so designated, such funds may be accessed only through the card.⁶ The identity of a particular cardholder is generally, but not necessarily, known.⁷ The knowledge of a cardholder's identity is a policy issue to be determined by the system's administration authority; it is not a capability limitation of the system. If the person's identity is known, it is possible to deactivate the linkage between the card and its value store in the event that a cardholder reports its loss in a timely manner.⁸

On-line stored value systems, where the cardholder is known to the system, have found their primary application in campus card systems. A campus consists of a geographically contained facility, under localized management, that has an associated community of people. Colleges and universities, cruise ships, vehicle refueling operators, specialty retailers, hospitals, and correctional institutions are the main users of campus cards systems.⁹

6. See 61 Fed. Reg. at 40,490 n.1.

7. Anonymity provides the cardholder with the advantage that if the card is lost, the value is not necessarily lost if the card loss is reported in a timely manner.

8. Because transactions are authorized and settled at the instant they are conducted against a remote database, the card accessing the account can be deactivated once it is known by the system operator that the card has been lost. This procedure is well-known to credit card holders. If the card is lost, the cardholder calls the toll free number to report the loss. Shortly thereafter, the card no longer can be used because access to the credit authorization computer maintaining the cardholder account is blocked by the operator.

9. Other examples of campuses include corporate headquarters, factories, country clubs, and resorts.

On-line stored value systems, where the cardholder is anonymous, are the most common form of electronic stored value in the United States. These are typically in the form of pre-paid telephone calling cards. A calling card number is linked to a pre-denominated account. When the purchase price value associated with the card is exhausted, the card is discarded by the user. Correspondingly, the numbered account is discarded automatically by the host computer system and never is reused.

Although off-line stored value systems have the potential to act as a generalized cash surrogate, magnetic technology is too insecure to be used safely in "open systems."¹⁰ The magnetic technology is easy to reverse engineer and compromise.¹¹

In an off-line system the card has to perform additional functions that it does not have to execute in an on-line system. To protect the holder, the card must store the value in a way that it cannot vanish, erroneously lose part of its value, or become corrupted so that its value becomes unavailable. To protect the agent holding the funds that are represented on the card, cards should be uneconomical to counterfeit or copy. To the extent that copying or counterfeiting is

10. See David G. Hayes, *An Introduction to Electronic Money Issues*, in TOWARD ELECTRONIC MONEY AND BANKING: THE ROLE OF GOVERNMENT 8, 8-9 (Sept. 19, 1996) <<http://www.occ.treas.gov/emoncy/papinf.htm>> [hereinafter TOWARD ELECTRONIC BANKING] (on file with *The American University Law Review*).

One convenient way to understand stored value cards ("SVC") is to classify them as representing either "closed" or "open" systems. SVCs that are limited to just a few merchants regardless of location, or to many merchants in a relatively small geographic area, would represent a closed system. SVCs that consumers could use at many different businesses over a large geographic area would represent an open system. The distinction between closed and open, however, is largely one of degree.

One example of a closed system SVC is one in which the card issuer and the seller of the goods and services are one and the same (the "merchant-issuer" model). Examples of such cards include: the farecard used by riders of the subway system in Washington, D.C.; cards issued by a number of colleges and universities in the United States to students and perhaps to employees so that holders may use them to purchase a variety of goods and services supplied by the college or university; cards issued by public bodies; and cards issued by certain telephone companies to pay for telephone calls. See *id.*

Examples of open system SVCs exist today in several countries in Europe and the Far East, and to a more limited extent, in the United States. They work essentially in the same manner as bank-issued SVCs in closed systems, with the important exception that a greater variety of businesses over a relatively larger geographic area accept them. See *id.*

11. "Unfortunately, it is very easy to copy the usual kind of magnetic stripe card. Cards can be manufactured, without excessive difficulty, to resemble true cards sufficiently well as to deceive most people having to deal with them." D.W. DAVIES & W.L. PRICE, *SECURITY FOR COMPUTER NETWORKS: AN INTRODUCTION TO DATA SECURITY IN TELEPROCESSING AND ELECTRONIC FUNDS TRANSFER* 178 (2d ed. 1989). Also, the ability of the card handling terminal to update one of the value recording areas on the card can be crippled temporarily by, for example, putting cellophane tape in just the right spot over the magstripe. The system still is likely to accept the card, because it will be able to read both value stores even though it is only able to decrement one of them. When the cellophane is removed, both stores are visible again. See generally *id.*

occurring, the payments system will be unable to settle future claims for payment. The crucial difference between on-line and off-line systems is that copying a card in an on-line system yields only an additional access device to a single store of funds, while in an off-line system, additional funds are created fraudulently by duplication.

In on-line systems, the security problem can be approached from the system level and does not depend on the security of the card per se. The fact that additional funds cannot be created by copying the card provides a level of security over off-line systems. The fact that the link between the cards and the funds can be severed by administrative action to the system provides another level of security over off-line systems. Sophisticated pattern analysis of transaction activity can be accomplished in real time, and this provides yet another level of security.

The security of magnetic recording can be enhanced through techniques such as: (1) encrypting the data in order to hide it; (2) making it less compatible with readily available readers and writers;¹² or (3) using some intrinsic physical feature of the card that is known to vary in a random way from card to card, and somehow, incorporating that feature into the encoding of the information on the card so that the encoded information works only on that particular physical card. None of these techniques either alone or in combination, however, provides the level of security that a smart card can provide.

Failure to take these limitations of magnetic technology into account has lead to disastrous consequences. A case in point occurred in Japan, where two large trading companies sustained a \$550 million loss on magnetic cards used in a pachinko machine payments system.¹³

12. Compatibility can be lessened by recording and reading the flux reversals that contain the digital information at some acute angle with respect to the center line of the data track rather than perpendicular to it as is normal practice.

13. See Steve Glain & Norihiko Shirouzu, *Lost Gamble: How Japan's Attempt to Slow Nuclear Work in North Korea Failed*, WALL ST. J., July 24, 1996, at A1 (noting that attempts to replace cash with magnetic cards in pinball games resulted in huge losses due to counterfeit cards).

Figure 1

Mode of card compromise	Off-line	On-line
Stolen	Value contained on the card is lost to the card holder. To the extent that the value on the card remains unspent, the settlement fund ultimately will show a surplus.	Value associated with the card may or may not be lost to the card holder depending on the circumstances.
Copied or skimmed	Additional purchasing value is created in an amount equal to the amount on the card copied. The settlement fund will be short by this amount when all payment claims eventually are settled.	A duplicate access device is created to the same value accessible from the copied card. No additional purchasing value is created.
Counterfeited	Additional purchasing value is created in an amount equal to the amount on the counterfeited card. The settlement fund will be short by this amount when all payment claims eventually are settled.	An access device is created to some stored value register. No additional purchasing value is created.
Altered, modified, or refreshed	The effect is the same as counterfeiting.	The effect is the same as counterfeiting.
Information corrupted	The value on the card is lost to the cardholder. The settlement fund eventually will show an incremental surplus equal to the value on the card when it became corrupted.*	Value is unavailable to cardholder via the corrupted card. The value is not lost to the cardholder because a replacement card can be issued.
Erased	Same effect as information corrupted.	Same effect as information corrupted.

* To ameliorate the security problem, some cards store the value on the card in two physically separate places so that if one store becomes corrupt, the remaining store can be used to recover the card's true value or the card's value before the last transaction, depending on the circumstances causing the corruption. It is beyond the scope of this Essay to describe the methodology, but this very feature can be used by a clever person to defraud the system.

As in this Japanese case, off-line systems can be used with a "blind funds pool."¹⁴ For these to be successful, it is absolutely necessary that the aggregate amount of value stored on all cards in circulation be less than or equal to the amount of money held by the card issuer in order to settle card-based payment transactions. If the card issuer holds less money than the circulation value of its issued cards, the payments system becomes insolvent.¹⁵

The next technical advance that currently is changing the face of stored value is the smart card. The smart card contains non-volatile memory and a microprocessor that is programmed to put a cryptographic barrier between the data in the card and the outside world.¹⁶ The cryptographic barrier can be integrated with programmatic logic and on-card digital storage to implement a so called "electronic purse."¹⁷ Although stored values on smart cards have the appearance of being impervious, cards based on magnetic technology are not entirely secure. It is exceedingly difficult for an unauthorized individual to obtain data from a properly designed and implemented smart card, but penetration of cryptographic protection is possible.¹⁸

14. The terminology of a "blind funds pool" is the author's own. The idea is that a "pool" of "funds" held by a fiduciary representing a liability against credits is carried in electronic form on a multitude of issued and outstanding storage devices. The liability account is held on deposit to settle transactions for the account of merchants accepting electronic credits spent by holders of the storage devices. The balancing equation for this financial system is that the aggregate of credits on the storage devices is equal to the balance of the liability account at the end of any business day. The notion of "blindness" arises from the fact that there is no way to confirm a balance; the aggregate of credits on storage devices never can be known, because there is no way to ascertain each individual balance simultaneously. The viability of such a system depends on its invulnerability to fraud, because such fraud is exceedingly difficult to detect until the system is grossly (and insolvently) out of balance. In contrast, in an on-line environment, the total of all credits outstanding by card can be determined with certainty and at will from the centralized database.

15. See Notice of FDIC General Counsel's Opinion No. 8; Stored Value Cards and Other Electronic Payment Systems, 61 Fed. Reg. 40,490, 40,490 (1996) (identifying primary legal issue raised by stored value card system as whether and to what extent funds underlying stored value cards constitute deposits within meaning of section 3(1) of Federal Deposit Insurance Act). Unlike holders of traditional cash who are protected against issuer insolvency, it is expected electronic cash holders will bear this risk. See Hayes, *supra* note 10, at 23.

16. See DAVIES & PRICE, *supra* note 11, at 182 (discussing the physical security attributes of smart cards); Catherine A. Allen & Jeffrey Kutler, *Overview of Smart Cards and the Industry*, in SMART CARDS: SEIZING STRATEGIC BUSINESS OPPORTUNITIES 2, 3-4 (Catherine A. Allen & William J. Barr eds., 1997) [hereinafter SMART CARDS] (defining smart cards as credit card-sized cards storing and processing information on integrated microprocessor chip).

17. See FEDERAL RESERVE BANK OF N.Y., THE ELECTRONIC PURSE: CURRENT ISSUES IN ECONOMICS AND FINANCE 1-5 (1995); COMMITTEE ON PAYMENT AND SETTLEMENT SYSTEMS AND THE GROUP OF COMPUTER EXPERTS, CENTRAL BANKS OF THE GROUP OF TEN COUNTRIES, BANK FOR INTERNATIONAL SETTLEMENTS, SECURITY OF ELECTRONIC MONEY 6-7 (1996) [hereinafter SECURITY OF ELECTRONIC MONEY]. See generally Allen & Kutler, *supra* note 16, at 3, 4.

18. See SECURITY OF ELECTRONIC MONEY, *supra* note 17, at 52. The Committee explains: To date, there have been no published reports of security breaches of smart cards, although some instances of tampering with simpler memory cards are known. Tampering with a chip would entail overcoming many physical and cryptographic

Relying on this feature, the Mondex system, which is being deployed around the world, is completely off-line with respect to routine transactions between cardholders and merchants and even between multiple cardholders.¹⁹

Financial institutions are actively pursuing smart card-based payments systems.²⁰ These systems afford new market opportunities by expanding the mix of payments systems in which banks can participate. Moreover, they have the potential to solve current limitations and problems in credit and debit card systems. As with any major change in technology, however, there is a myriad of issues surrounding the development of the smart card, including: consumer acceptance; system performance and security; and appropriate statutory regulation.

I. LEGAL STATUS OF STORED VALUE

A well-developed regulatory framework exists for long-standing and well-understood forms of stored value such as traveler's checks and money orders. Various state statutes govern payment instruments of this type. In California, for example, traveler's checks are governed by chapter fourteen of the California Financial Code.²¹ The most important regulatory feature common to both of these stored value schemes is that the face value of the instrument must be fully backed at the issuing institution by cash or highly liquid, low risk financial investments.²² This requirement is an important safety and sound-

barriers. This does not mean that the current security measures will continue to be sufficient in the future. As new techniques for attacking chips are developed, the current security measures may become obsolete and new ones will have to be adopted. In addition to new physical security measures, systems utilizing IC [Integrated Circuit] cards should be designed to allow the security of the IC card to be upgraded, for example by implementing new or redundant algorithms. . . . [C]onsiderable care must be taken to implement administrative and procedural security measures effectively. In view of the robustness of the technical security features of smart cards, an attack on administrative security during the manufacturing, distribution, or issuing process (such as theft of ready-to-distribute cards) may constitute a greater risk.

Id.

19. See MONDEX, INT'L, FULLY FLEDGED: THE GLOBAL PAYMENTS SYSTEM COMES OF AGE (1996).

20. See Mondex U.S.A., *Mondex U.S.A. Bom* (Dec. 6, 1996) <http://www.ramresearch.com/crdflash/cf12_6a_96.html> (on file with *The American University Law Review*). Mondex announced in London on December 5, 1996 that Mondex USA was being formed by the following financial institutions: AT&T, Chase Manhattan, Dean Witter Discover (NOVUS), First Chicago NBD, MasterCard, Michigan National Bank, and Wells Fargo Bank. See *id.*

21. 14 CAL. FIN. CODE §§ 1851-1897 (West 1989 & Supp. 1996).

22. See Judith Rinearson, Smart Cards and Stored Value: Other Developments, Address Before the Stored Value Group (Sept. 17, 1996).

ness protection because these financial instruments generally are sold by non-bank issuers.

Many of today's SVC products are issued by non-bank issuers. Because these organizations have neither the oversight of bank regulators nor the protection of federal deposit insurance, liquidity and safety of principal are mandatory for the protection of the users of these products. Furthermore, because these issuers are prohibited from leveraging their deposits in the way that banks are permitted to, there is no effect on the money supply.

Various government agencies now are considering which regulatory postures they should take. The Office of the Comptroller of the Currency has issued a bulletin to provide information for banks and examiners regarding stored value systems.²³ The bulletin identifies various roles that banks play with respect to stored value systems and the risks associated with each role. Various consumer awareness disclosures were encouraged to clarify how these products work, how to use them in practice, what to do when the unexpected happens, and what risks consumers are taking by using these products.²⁴

The Federal Reserve Board ("FRB") has been studying changes to Regulation E²⁵ for at least the last two years, and in September 1996, it concluded a public comment period on a proposed rule for stored value cardproducts.²⁶ A final rule is likely to be promulgated by mid-1997.²⁷ On September 30, 1996, President Clinton signed H.R. 4079 containing a provision that required the FRB to study the applicability of the Electronic Funds Transfer Act to stored value transactions and to report its findings to Congress. The FRB recently appointed a special committee "to study the effect of smart cards and other electronic banking products on the payment system."²⁸

23. Stored Value Card Systems, OCC Bulletin 96-48 (Sept. 10, 1996), *available in* LEXIS, BANKING Library, ALLOCC File.

24. *See id.*

25. *See* Electronic Fund Transfers, 12 C.F.R. pt. 205 (1996) (establishing basic rights & liabilities of consumers who use electronic fund transfer services and of financial institutions that offer these services).

26. *See* Electronic Fund Transfers, 61 Fed. Reg. 19,696, 37,229 (1996) (to be codified at 12 C.F.R. pt. 205) (proposed May 2, 1996). The comment period originally was scheduled to conclude on August 1, 1996. *See id.*

27. The current schedule for the rulemaking process is to complete the study by the end of March 1997, and to report to Congress by the end of June 1997. *See* Telephone Interview with Consumer Affairs Department of FRB (Feb. 6, 1997).

28. Alan Yonan, Jr., *Fed Panel to Study Effect of Smart Cards on Payment System*, Dow Jones Business News Service, Oct. 17, 1996, *available in* Westlaw, ALLNEWSPLUS Database. H.R. 4079 provides:

(a) Study Required.—The Board of Governors of the Federal Reserve System shall conduct a study of whether, and the extent to which, the Electronic Fund Transfer Act is applicable to, or should or should not be applicable to, any payment for transactions

The Federal Deposit Insurance Corporation ("FDIC") also issued an opinion and a request for public comments.²⁹ The FDIC opines that it has a role because with working stored value systems, the cards don't contain real money; they contain a claim to deposit liabilities that are likely to be maintained in a bank.

The American Banker's Association ("ABA") has formed a payments system task force to evaluate issues surrounding current and prospective changes in payments system technology, so that it may advise regulators constructively.³⁰ The ABA argues that all three-party payments systems should be regulated through depository institutions, and appears willing to take a "wait-and-see" position on two party payments systems.³¹ As they point out in their 1996 Executive Summary:

The current problems with pre-paid phone cards [a type of off-line system]—where thousands of consumers who purchased pre-paid long-distance telephone time found themselves with worthless cards as a result of billing disputes and outright fraud on the part of vendors—provide a peek into the dangers of allowing free rein in the issuance of third-party instruments.³²

Until recently, there was no legal concept of an on-line stored value payment system. To the extent that regulators were aware that SVCs existed, they usually were regarded as a specialized form of a debit card system. However, both the FRB and the FDIC have recognized and defined on-line stored value systems.

The FDIC defines an "on-line stored value" system as one that operates in a manner that is the functional equivalent of using a debit card to access a traditional deposit account. Notably, this type

by a person through the use of value stored on, or assigned to, a card, device, or computer if the card, device, or computer is not used to actually access an account in order to effect the transaction.

(b) Report.—

(1) In general.—The Board of Governors of the Federal Reserve System shall submit a report on the study required under subsection (a) to the Congress before the end of the 90-day period beginning on the date of the enactment of this Act.

H.R. 4079, 104th Cong. § 144 (1996).

29. See Notice of FDIC General Counsel's Opinion No. 8; Stored Value Cards and Other Electronic Payment Systems, 61 Fed. Reg. 40,490, 40,490 (1996) (setting forth Legal Advisor's conclusions on issue of whether, and under what circumstances, funds underlying stored value cards may be considered deposits under the Federal Deposit Insurance Act).

30. See American Bankers Association, *ABA Payments System Task Force Executive Summary*, (visited Nov. 16, 1996) <<http://www.aba.com/payment.htm>> (on file with *The American University Law Review*) (outlining principles intended to provide framework for looking at emerging payment systems issues, to guide future policy decisions, to promote public understanding of importance of maintaining payments system integrity, and to promote vital rule for banks as premier providers of payments system services).

31. See *id.*

32. *Id.*

of system involves on-line access to a database for purposes of transaction authorization and data capture. That is, when the card is used at an ATM or a POS terminal, the transaction is authorized by means of on-line communication with the data facility, where the transaction data are stored (including information such as merchant identification, amount, date, and card number). The balance of funds available to the consumer is not recorded on the card itself, as in off-line stored value systems; instead, the balance information is maintained in the data facility. Two distinctions between these systems and traditional deposit accounts accessed by debit card are (1) the value associated with a card is limited to the amount that the cardholder has chosen to make accessible through the card (as opposed to a deposit account accessed by debit card, where the entire account is accessible and funds available may fluctuate); and (2) the value associated with the card is accessible only through use of the card itself (in contrast to deposit accounts accessible by debit card, which typically may be accessed through various means, including check, withdrawal slip, ACH, or telephone bill payment).³³

Note that the FRB and the FDIC are consistent in their determinations of the differentiating factors between debit and stored value systems. Stored value is accessible only by the card, and the value accessible by the card is limited to an amount determined by the cardholder. In other words, you can get at your funds if, and only if, you use your card.

In establishing a taxonomy of stored value systems to undergird both an understanding of the issues and a regulatory framework, the FRB and the FDIC are on different ground. The FRB defines three categories of systems: (1) off-line unaccountable stored value systems; (2) off-line accountable stored value systems; and (3) on-line stored value systems.³⁴ The FDIC defines four categories of systems: (1) Bank Primary—Customer Account Systems; (2) Bank Primary—Reserve Systems; (3) Bank Secondary—Advance Systems; and (4) Bank Secondary—Pre-Acquisition Systems.³⁵

Starting first with the FRB view, in off-line unaccountable stored value systems, the value is stored on the card and there is no external tracking of card transactions. In off-line accountable stored value systems, there is an external tracking of card transactions that can be

33. Electronic Fund Transfers, 61 Fed. Reg. 19,696, 19,699 (1996) (to be codified at 12 C.F.R. pt. 205) (proposed May 2, 1996).

34. See *id.* 19,698.

35. See Notice of FDIC General Counsel's Opinion No. 8; Stored Value Cards and Other Electronic Payment Systems 61 Fed. Reg. 40,490, 40,490 (1996) (defining four types of systems).

balanced to the value on the card. In on-line stored value systems, there is no stored value encoded in the card. The stored value associated with the card is held in a centralized database.³⁶

The FDIC views things differently. "In some systems the funds underlying the SVC could remain in a customer's account until the value is transferred to a merchant or other third party, who in turn collects the funds from the customer's bank."³⁷ The FDIC refers to these as Bank Primary—Customer Account Systems.

In other systems, called Bank Primary—Reserve Systems, "as value is downloaded onto a card, funds are withdrawn from a customer's account (or paid directly by the customer) and paid into a reserve or general liability account held at the institution to pay merchants and other payees as they make claims for payments."³⁸

In still other systems, the electronic value is created by a third party and the funds underlying the electronic value are ultimately held by such third party ("Bank Secondary Systems"). In such systems, depository institutions act as intermediaries in collecting funds from customers in exchange for electronic value. In some Bank Secondary Systems, the electronic value is provided to the institution to have available for its customers. As customers exchange funds for electronic value, the funds are held for a short period of time and then forwarded to the third party.³⁹

These systems are called Bank Secondary—Advance Systems.

In other Bank Secondary Systems, "the depository institution will exchange its own funds for electronic value from the third party and in turn exchange electronic value for funds with its customers."⁴⁰ The FDIC refers to these systems as Bank Secondary—Pre-Acquisition Systems.

The FDIC explains that in Bank Secondary Systems, "the depository institution may have a contingent liability to redeem the electronic value from consumers and merchants. As such electronic value is redeemed, the institution may in turn exchange the electronic value for funds with the third party."⁴¹

These represent two very different ways of looking at stored value. The FRB is interested primarily in consumer protection as it carries

36. See *id.* at 19,699.

37. See *id.* at 40,490 n.1.

38. See *id.* at 40,490.

39. See *id.*

40. See *id.*

41. See *id.*

out its responsibilities under the Electronic Funds Transfer Act.⁴² The FDIC is trying to categorize stored value in order to determine "the circumstances under which the funds underlying SVCs may or may not be considered deposits within the meaning of the FDIA."⁴³ Note that the FRB classifications are independent of the involvement of a depository institution. The nature and degree of involvement of a depository institution, however, is key to the FDIC classifications. Government regulatory agencies are not particularly interested in coordinating their regulatory efforts in order to mitigate the burden that may be placed on those regulated.⁴⁴

A. *University Card Systems—Legal Issues*

Early adopters for smart card electronic purse technology include closed system users such as universities, sports stadiums, and corporate campuses. Potential open system users include countries lacking an efficient and economical telecommunications infrastructure, and states having an acute concern over regulatory compliance with banking or Electronic Funds Transfer ("EFT") laws. This may be true particularly in states that have enacted their own electronic funds transfer statutes. Section 919 of the Electronic Funds Transfer Act ("EFTA")⁴⁵ provides that federal law does not "annul, alter, or affect the laws of any State relating to electronic funds transfers, except to the extent that those laws are inconsistent with the provisions of this subchapter, and then only to the extent of the inconsistency."⁴⁶

The state of Michigan has such a statute⁴⁷ that has caused a number of universities within Michigan to retreat from on-line stored value systems in favor of off-line smart card systems. The University of Michigan in Ann Arbor was the first university to move to the new smart card system. In the spring of 1995, it began a pilot smart card

42. See generally RONALD I. BAKER ET AL., *THE LAW OF ELECTRONIC FUNDS TRANSFER SYSTEMS* ¶ 12.04[1] (2d ed. 1988). "The EFT Act is the primary federal law governing consumer rights in EFT transactions that involve a consumer asset account." *Id.*

43. 61 Fed. Reg. at 40,490.

44. Memorandum from Daniel M. Morton, Vice President and Counsel, Huntington National Bank, to the FDIC 2 (Sept. 5, 1996) (on file with *The American University Law Review*) ("The FDIC's Opinion indicates that the Board's classification system in its Regulation E proposal is 'not necessarily germane' to the FDIC analysis, and if that is the case, bank issuers may need to apply separate analyses in determining coverage issues under each.").

45. Electronic Fund Transfer Act § 919, 15 U.S.C. § 1693q (1994).

46. *Id.*

47. MICH. COMP. LAWS ANN. §§ 488.1-488.31 (West 1987) (authorizing financial institutions to make electronic funds transfers to customers but prohibiting unfair discrimination and monopolistic practices).

system with First of America Bank of Kalamazoo, Michigan, which became operational in the fall of 1995.⁴⁸

A number of years before the new system's introduction, the university administration had concerns about whether the university's on-line campus card system complied with Michigan banking and EFT laws. Because the university's on-line system was closed, only affiliated cardholders conducted transactions with affiliated service providers, and the administration was content to hold a guarded *laissez faire* attitude with respect to system propriety. After a group of off-campus merchants threatened suit against the university—arguing that the university was engaging in unfair competition and demanding that it open the university card program to off-campus businesses—the university was forced to switch to an off-line stored value system.⁴⁹

University card systems have been scrutinized in other states as well. In Florida, the Seminole Access Card of Florida State University was the first system in the United States to be linked with a student demand deposit account with a bank. The Comptroller of the State of Florida determined that the payments system violated § 658.74(1)(a)(b) of the Florida Code.⁵⁰ The comptroller found the Seminole access program violated the Code by: (1) "soliciting and receiving funds for deposit from students enrolled at the University,"⁵¹ (2) "paying checks on behalf of cardholders who use their cards for payment of goods and services and who use their cards to make cash withdrawals from ATM machines operated by First Florida Bank, both on and off the FSU campus,"⁵² (3) "maintaining a place of business in this state for the transaction of unauthorized banking activity,"⁵³ and (4) having the appearance of "transacting business in the manner of a bank."⁵⁴

48. The author was involved in this project personally. For an overview of the University of Michigan's "Mcard," see *Mcard Overview* (last modified Feb. 13, 1997) <<http://www.umich.edu/~busfin/Mcard/overview.htm>> (on file with *The American University Law Review*).

49. The university installed the off-line stored value system after evaluating the relevant risks involved. Although the university doubted the legality of their on-line campus card system, it was willing to accept the level of risk associated with university owned merchants. Allowing off-campus merchants to participate in the system posed a level of risk that the university considered to be unacceptable. As a result of the off-campus merchants' demands, the university switched to an off-line stored value system. See *id.*; see also *Mcard FAQs* (last modified Feb. 13, 1997) <<http://www.umich.edu/~busfin/Mcard/faq.htm>> (on file with *The American University Law Review*).

50. See Op. Fla. Comptroller Gen. (Nov. 16, 1990) (on file with *The American University Law Review*).

51. *Id.* at 1.

52. *Id.* at 2.

53. *Id.* at 3.

54. *Id.* at 4.

The card program was restructured and eventually received regulatory approval from the legal departments of both the Comptroller of the State of Florida⁵⁵ and the Chief Counsel's Office of the federal Comptroller of the Currency.⁵⁶ In order to comply with Florida's regulations, the university was required to remove the banking deposit account relationship from a national bank to a state bank and was forced to begin using an off-line rather than an on-line system for stored value payments.

In Texas, the Commissioner of the Texas Department of Banking conducted similar investigations into the "debit card" programs being operated by Texas A&M University, Stephen F. Austin State University, Texas Tech University, and Southern Methodist University.⁵⁷ Three issues were investigated: (1) whether the issuance of debit cards by these universities amounted to the sale of checks under the Sale of Checks Act;⁵⁸ (2) whether the universities were acting as banks by issuing debit cards and therefore needed to obtain a bank charter; and (3) whether the universities were statutorily authorized to issue debit cards to their students, faculty, and staff.⁵⁹

The situation in Florida differs from that in Texas, because none of the Texas universities had their card programs linked to demand deposit accounts at a financial institution. The legal approach to the issues also was very different between the two states. With respect to the issue of whether the universities were improperly involved in the sale of checks, the Attorney General of Texas reasoned that they were not because the Texas statute applies only to "persons."⁶⁰ According to relevant legal precedent, state institutions, such as three of the four universities, are not regulated as persons.⁶¹ The Attorney General also noted that the Sale of Checks Act "appears to contemplate that a check is a written instrument" and that the sale of a debit card

55. See Letter from Albert T. Gimbel, Chief Banking Counsel, Office of the Comptroller, State of Florida, to Jerome L. Edelstein, Senior Counsel, Corporate Organization and Resolutions Division, Comptroller of the Currency, Washington, D.C. (Mar. 31, 1993) (on file with *The American University Law Review*).

56. See Letter from William P. Bowden, Jr., Chief Counsel, Comptroller of the Currency, Administrator of National Banks, Washington, D.C. (Oct. 5, 1996) (on file with *The American University Law Review*).

57. See Letter from Dan Morales, Attorney General of the State of Texas, to Catherine A. Ghiglieri, Commissioner, Texas Department of Banking 1 (Mar. 9, 1995) (Op. No. DM-329) [hereinafter Morales Letter] (on file with *The American University Law Review*).

58. TEX. REV. CIV. STAT. ANN. art. 489d (West 1996).

59. See Morales Letter, *supra* note 57, at 1.

60. See *id.* at 2-3 ("The Act's prohibitions apply solely to 'persons' The State Universities do not appear even to fall within this definition.").

61. See *id.* at 2.

under the program described "does not involve the sale of a written instrument."⁶²

The Attorney General also determined that the universities were not involved in unauthorized banking, reasoning that under Texas law, no single feature defines a bank: The mere act of taking deposits does not define a corporation as a bank.⁶³ He concluded further that because receipt of student deposits is incidental to the business of a university, the universities were not acting as banks.⁶⁴

The universities also were found to have the authority to issue debit cards.⁶⁵ Legal precedent gives state universities "broad authority to provide services and to perform functions not expressly authorized by statute."⁶⁶ In summary, the Attorney General concluded that, with respect to the investigated issues, the universities were acting properly and within their authority in operating their card programs.⁶⁷

Two other states have initiated campus card-related legislation. Indiana's House of Representatives passed a bill that requires state educational institutions that issue debit cards for on-campus use to allow private retail merchants who compete with the on-campus stores to participate in the "debit" card program, as long as the debit cards are not used to purchase alcoholic beverages or tobacco products.⁶⁸ The bill never was brought to a vote in the other house of the legislature and now is dormant.

In February 1996, a bill was introduced in the Alabama House of Representatives and currently is before the House Committee on Banking.⁶⁹ The bill would "permit[] public institutions of higher learning to issue debit cards for student use on campus provided that off-campus merchants that sell the same kind of merchandise or services may also participate in the debit card program."⁷⁰

62. *Id.* at 3.

63. *See id.* at 4.

64. *See id.* ("We do not believe that a court would conclude that a university that offers a debit card program such as the one you described among its many and various activities engages in banking.").

65. *See id.* at 7.

66. *Id.* (noting that past opinions of Texas Attorney General's Office recognized such broad authority).

67. *See id.*

68. *See* H.R. 1322, 110th Leg., 1st Reg. Sess. (Ind. 1997). The bill was introduced in the Indiana House of Representatives on January 16, 1997. *See id.* On February 27, the bill was passed to the Indiana Senate Committee on Government & Regulatory Affairs. The Indiana Senate has not acted on the bill.

69. *See* H. 341, 1997 Reg. Sess. (Ala.); S. 306, 1997 Reg. Sess. (Ala.).

70. H. 341; S. 306.

The 104th Congress introduced two bills proposing to regulate stored value systems: House Bill H.R. 1858⁷¹ and Senate Bill 650.⁷² Each of the proposed bills would exempt all stored value products from Regulation E.⁷³ Action on both has been delayed to allow for further study.

Multiple universities in the state of Michigan, and one university in the state of Florida, were driven to initiate off-line stored value programs due to legal concerns. At least one state, Texas, has been able to resolve these legal issues to its satisfaction and continues to operate its existing on-line stored value systems.⁷⁴ Other states are in the process of pursuing legislation to clarify the purposes and legal boundaries of campus card systems. For other states, the matter has not yet arisen as an issue. Congress is aware of the stored value issue and seems to be inclined to some type of preemptive action.

B. Stored Value and Regulation E

Table 1 shows that the technology used in stored value systems often is determined by certain protection factors required under Regulation E. Off-line accountable and on-line stored value systems provide similar feature sets; it would be difficult for a cardholder to perceive any difference. On-line systems, however, are held to a higher standard of consumer protection. They prohibit unsolicited issuance, limit cardholder liability, require error resolution procedures, provide re-credits for alleged errors, and require initial disclosure, terminal receipts, and balance and transaction history upon request.⁷⁵

The FRB's proposal to distinguish between on-line and off-line technology is not rationally related to protecting consumers' interests. As David Boyles of American Express explained in his testimony before the House Subcommittee on Domestic and International Monetary Policy:

On-line stored value is the most secure and affords the consumer the greatest protection because every transaction is authorized and recorded. That means that stolen cards can be "turned off" and that users can track all of their spending. In contrast, the off-line cards have gaps in their capabilities and lost or stolen cards often

71. H.R. 1858, 104th Cong. (1995).

72. S. 650, 104th Cong. (1995).

73. 12 C.F.R. § 205.5(1) (1996).

74. See *supra* notes 57-67 and accompanying text.

75. See Electronic Fund Transfers, 61 Fed. Reg. 19,696, 19,702 (1996) (to be codified at 12 C.F.R. pt. 205) (proposed May 2, 1996).

Table 1: Regulation E Proposal Summary*

System Type	Prohibits Unsolicited Issuance	Initial Disclosures	Change in Terms Notice	Receipts	Periodic Statements	Balance and Transaction History				Error Resolution Procedures	Provisional Recredits for Alleged Errors	Annual Error Resolution Notices
						Upon Request	Liability Limits	Resolution	Errors			
1. Stored-value account not greater than \$100	No	No	No	No	No	No	No	No	No	No	No	No
2. Off-line unaccountable stored-value systems, card account >\$100	No	No	No	No	No	No	No	No	No	No	No	No
3. Off-line accountable stored-value systems, card account >\$100	No	Yes	No	No	No	No	No	No	No	No	No	No
4. On-line stored-value system, card account >\$100	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5. Electronic benefit transfer systems (§ 205.15, eff. 3/1/97)	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* This table was presented by James J. Hayes, Stored-Value Cards Under Regulation E, Address Before the Smart Card Forum Annual Meeting 14 (Sept. 17, 1996) (presentation on file with *The American University Law Review*).

cannot be refunded or replaced. Moreover, emerging technologies make it possible to blend both on-line and off-line capabilities on the same card. In such cases, different levels of regulation for different kinds of technology will be confusing to customers, difficult for regulators to apply, and nearly impossible for the judiciary to interpret. . . . [S]ome specific requirements make no sense. For example, the proposed rules require that receipts be issued for all on-line transactions, but not off-line transactions even though they involve an identical activity.⁷⁶

Mr. Boyles summed it up well when he pointed out that "each can of soda would require a separate paper receipt."⁷⁷

C. *Disadvantages of Stored Value*

One disadvantage of stored value systems is that, unlike "deep stores" of accessible value available on credit cards, there is a necessity to manage the amount stored on the smart cards. This effect is seen readily in practice in the closed stored value systems operated by universities. Sales "lift" is the vending industry term for the marginal increase in product sales seen at a vending machine when some positive change factor influences people to buy more. The amount of sales lift seen at vending machines is significantly higher, as much as double the usual sales, for on-line systems where the value associated with the card may be in the hundreds of dollars versus off-line SVCs where the value on the card is in the tens of dollars. If the maximum value accessible by the card is relatively small, the card will require frequent reloading with value. This puts an extra burden on the cardholder, which appears in the case of vending as a relative reduction in sales "lift."

A second disadvantage to stored value is the loss of "float" that accompanies credit card transactions: When a purchaser transacts with credit, the purchaser's money remains in their control until payment is due. With smart cards, money stops working for its owner when the money is loaded to the card.

D. *Disintermediation*

In conventional usage, disintermediation deals with money being moved from one holder to another as a result of dislocations in

76. *The Future of Money—Part 4: Hearing Before the Subcomm. on Domestic and Int'l Monetary Policy of the House Comm. on Banking & Fin. Servs.*, 104th Cong. 227 (1996) (statement of David Boyles, Senior Vice President, New Business Ventures, Stored Value and Smart Card Center of Excellence, American Express) [hereinafter *The Future of Money—Part 4: Hearing*].

77. *Id.* See generally MARTIN MAYER, *THE BANKERS: THE NEXT GENERATION* 164 (1997).

interest rate markets such that usual and customary intermediaries are replaced by other intermediaries. Without torturing the conventional definition, it is fair to say that disintermediation can occur with stored value systems, because they provide the opportunity for private monies to displace national fiat money. This has the effect of disintermediating banks from a part of the payments system in which they otherwise might participate, all other considerations being equal. The following quotes are illustrative:

Nothing that's been said about e-cash so far is a law of nature. There's no reason why issuing electronic purses should be the preserve of banks and there's no reason why the contents of those purses should be nationalised fiat money. There is a new competitive strategy opening up for organizations with strong brands: issue your purse and put your own units on it.

The basis for the competition here is known as "regulatory arbitrage." Bank-issued electronic purses carrying fiat money are subject to all sorts of banking rules and regulations. Non-bank purses carrying so other units are not. Thus, non-banks can operate the business more efficiently than banks can!⁷⁸

"There isn't going to be much room for traditional intermediaries. Ultimately banking is going to be a line or two of application code in a big network."⁷⁹

E. Escheat

Escheat is the reversion of abandoned tangible personal property to the state after a period of general dormancy. Escheat is a state, not a federal issue. This is particularly important in any discussion of off-line stored value systems, as the value associated with the card is not associated with a named person. There are many circumstances in which a card's value will be unused, such as lost cards, cards purchased as collectibles with their full value intact, and unused small residual card amounts.

In order to determine amounts of funds subject to escheat, it first must be possible to ascertain the total amount of funds outstanding. Then it must be possible to assign all of these funds to two categories:

78. David G.W. Birch, *E-Cash for Lawyers*, slide 9 (June 1996) <<http://www.hyperion.co.uk/pub/library/htmllibrary/spa96/>> (on file with *The American University Law Review*). "Fiat money" usually refers specifically to paper money or coins with face values in excess of their bullion values, not redeemable in gold or silver. Excessive issuance of such money eventually leads to depreciation of its value. See Lewis D. Solomon, *Local Currency: A Legal and Policy Analysis*, 5 KAN. J.L. & PUB. POL'Y 59, 65 (1996).

79. Birch, *supra* note 78, slide 10 (quoting John Reed, Chairman of Citicorp (June 1995)).

dormant and non-dormant. A determination of dormant funds requires knowledge of the last time a transactional activity occurred for a given card and the amount on cards for which the last transaction occurred outside the period of general dormancy.

The only way to monitor this process is to have a view of transactions as they occur. This can be done practically by storing an electronic copy of all payments transactions in the merchant's terminal and then periodically uploading and processing the transactions into a database containing all card transactions for the payments system. This constraint precludes allowing person-to-person payments, because individuals have no reason to provide the payments system operator with transaction details. The only events in which an individual would interact with the payments system operator are to add funds to or remove funds from the card.

In stored value systems where the owner of the value is anonymous, it usually is difficult to determine the amount of value that has fallen into "general dormancy," as there is no accounting basis for making the determination. Methodologies utilizing expiration dates could be created, making it possible to evaluate dormant card value amounts. However, these methodologies are cumbersome and require encoding expiration dates to cards and providing notice of the expiration date to cardholders in the event that they purchase or reload a card. Furthermore, value cannot be transferred between cardholders; it can be transferred only between cardholders and merchants. There also must be a centralized reconciliation of all merchant transactions, which is very difficult. The problem is more tractable in on-line accountable systems, because the last transaction date for each cardholder is maintained easily.

The majority of the states have adopted model legislative principles governing escheat. The latest revision of the Uniform Unclaimed Property Act was approved in January 1996.⁸⁰ Although the Act "[c]ontinues the general proposition that all intangible property is within the coverage of this Act," it declares that "[s]tored value or prepaid products are not specifically included in the list of properties subject to the Act."⁸¹ The Act also shortened the period of general dormancy from seven to five years.⁸²

In the special case of university campus card systems, issues of escheat typically are avoided by contract. Prepaid services are

80. See UNIF. UNCLAIMED PROPERTY ACT (amended 1995), 8B U.L.A. 62-91 (Supp. 1996).

81. Rinearson, *supra* note 22.

82. See UNIF. UNCLAIMED PROPERTY ACT § 2(a)(15).

contracted for fixed intervals of time, such as an academic quarter or semester. Depending on the university, any value unused at the end of the time interval is either forfeited or carried over to the next interval. If a student leaves school mid-semester, the remaining stored value may be returned in cash, often minus a service fee. If a student graduates, there is no return of unused value.

F. Anonymous Cash and Strong Encryption

The world of physical cash is protected by physical hardware in the form of vaults for storage and armored cars for transportation. Electronic cash reduces monetary value to information in binary form—one dollar is just a combination of binary bits that someone will accept from the holder as being worth one dollar. Electronic cash is stored in electronic memories and is transported by data communications. How can something as ethereal as electronic cash be made secure?

Cryptography is the art and the science of keeping information secure.⁸³ Cryptography provides the armor for storing and transporting electronic cash. The armor is mathematical rather than physical and is provided by exceedingly complex calculations created by computers used in electronic money systems. These computers are incorporated in various positions in the topology of electronic money systems, including access devices in the form of smart cards, processors in merchant terminals and the central processing resources of the money system operator.

Encryption is the process of disguising a message in order to hide its substance.⁸⁴ It works by introducing additional information along with the useful information being stored or sent to keep the message secure. The availability of strong encryption that provides the security underpinning electronic payment systems also prevents threats to various government activities, including law enforcement agencies concerned with national security and agencies concerned with tax collection. The same security that allows private transactions, prevents tampering by unauthorized parties, and authenticates participants' identities, also can be used to thwart the interests of government.

The federal government, in order to provide a stop-gap remedy, has classified strong encryption as munitions to block export of embodiments of these techniques, whether in hardware or software, outside

83. See BRUCE SCHNEIER, *APPLIED CRYPTOGRAPHY: PROTOCOLS, ALGORITHMS, AND SOURCE CODE IN C 1* (2d ed. 1996).

84. See *id.*

the United States.⁸⁵ Furthermore, to reduce the strength of encryption used domestically, the government has proposed various techniques to provide additional keys for the exclusive use of government agencies to provide a "back-door" into encrypted objects that may be the subject of search warrants. Various key escrow schemes have been proposed not only to protect the anonymity of data objects under normal circumstances, but also to give government representatives access to them when there is a legitimate need.⁸⁶ These proposals have met with vociferous resistance from the cyber-community.

The prospect of anonymous electronic cash raises a number of public policy issues because it allows for the private, untraceable exchange of money—something new in the history of money. As Federal Reserve Board Vice Chairman, Alan Blinder, testified before Congress:

Over the longer term, . . . it seems possible that electronic mechanisms that can hold large balances and make large untraceable transfers over communications networks could become attractive vehicles for money laundering and other illicit activities—especially if they are widely used and bypass the banking system. Existing anti-money-laundering regulations may then need modification.⁸⁷

G. *Materiality of Stored Value Amounts in the Financial System*

The United States has the world's largest payments system. An average of 1.4 billion payments transactions totaling \$1.5 trillion are conducted on a daily basis.⁸⁸ Clearly, there are some huge transactions in the mix. More than eighty percent of all customer retail purchases in the United States are paid for in cash; the vast majority of these transactions are less than \$20.⁸⁹ Banks and other financial institutions are attracted to stored value systems based on the prospect of enlarging their markets. However, one must question to what degree converting cash payments to electronic payments is material. Martin Mayer observes:

85. See International Traffic in Arms Regulations ("ITAR"), 22 C.F.R. § 121.1 cat. XIII(b) (1996); Export Administration Regulations ("EAR"), 15 C.F.R. pts. 730-799 (1996).

86. See Jill M. Ryan, *Freedom to Speak Unintelligibly: The First Amendment Implications of Government-Controlled Encryption*, 4 WM. & MARY BILL RTS. J. 1165, 1174-83 (1996) (describing government's fear of strong encryption in hands of public).

87. *The Future of Money—Part 2: Hearing Before the Subcomm. on Domestic and Int'l Monetary Policy of the House Comm. on Banking & Fin. Servs.*, 104th Cong. 70-71 (1995) (statement of Alan S. Blinder, Vice Chairman, Board of Governors of the Federal Reserve Board).

88. See 1995 FEDERAL RESERVE BANK ST. LOUIS ANN. REP. 15 (discussing history of payments systems in United States).

89. See *id.* at 10.

[T]he volume of traveler's checks outstanding is greater than the total of credits anticipated for smart cards in the foreseeable future—especially in an environment where traveler's checks promise safety and the smart card is finders-keepers. If we assume half the nation's adult population is carrying smart cards with an average of \$30 on each (more when first loaded, less as time passes) we are talking roughly \$5 billion, which is a rounding error on the daylight overdrafts the [FRB] gives the banking system virtually without charge.⁹⁰

Because the most common media for stored value is the International Standards Organization ("ISO") "credit card" sized format,⁹¹ there is more to this than first meets the eye. At the Visa Cash trial at the 1996 Olympic Games in Atlanta, the biggest financial yield to the operators of the payments system did not come from transaction fees or from the time value of money that they were holding.⁹² Instead, it came from the stored value that never was used by cardholders, although this money was earmarked for—and subsequently donated to—the Atlanta Olympic Committee. Many different graphics designs were printed on the cards, making them valuable as collector's items. They became valued as collectibles rather than valued for their intended use. In fact, they were most valuable when none of the stored value on the card had been spent. The precise details of all this are being held confidential information by Visa and the three card-issuing financial institutions.⁹³

The Visa Cash stored value card is based on the Danmont system originally developed in Denmark.⁹⁴ Visa selected the 1996 Olympic Games in Atlanta as the site for its first large scale pilot of the Visa

90. Martin Mayer, Money and Chips, Keynote Address before the Smart Card Forum 11-12 (Sept. 16, 1996) (transcript on file with *The American University Law Review*). "Daylight overdrafts are \$70 billion per day loan from the Fed to banks that was interest free but now has some interest (below market) because [the Federal Reserve bank does not] want to lose the business to CHIPS [Clearing House Interbank Payments System]." *Id.*

91. See generally IDENTIFICATION CARDS—INTEGRATED CIRCUIT CARDS WITH CONTACTS, AMERICAN NATIONAL STANDARDS ORGANIZATION (ISO No. 7810, 1996); *A Smart Card Primer*, in SMART CARDS, *supra* note 16, at 242-47. The ISO, headquartered in Geneva, Switzerland, is the worldwide standards coordinating body for national standards organizations around the world. See International Org. for Standardization, *Welcome to ISO Online* (visited Feb. 27, 1997) <<http://www.iso.ch>> (on file with *The American University Law Review*). The national standards organization for the United States is the American National Standards Institute in New York. See American Nat'l Standards Inst., *ANSI Online* (visited Feb. 27, 1997) <<http://www.ansi.org>> (on file with *The American University Law Review*).

92. See FEDERAL RESERVE BANK ST. LOUIS ANN. REP., *supra* note 88, at 9-11 (noting evolution of world currency systems during last century including transition from bartering to coin and paper currency).

93. See *id.* at 12.

94. See Murray Church, *Olympic Hopefuls* (visited July 26, 1996) <<http://www.hmt.com/moneycard/articles/visa.htm>> (on file with *The American University Law Review*).

Cash product in the United States. Visa was the official payment system for the 1996 U.S. Olympic Team and was "The Official Card of Atlanta."⁹⁵ Three financial institutions, NationsBank, which was appointed by the U.S. Olympic Committee as the official bank of the Games, First Union Corporation, and the Wachovia Corporation, were the issuers of the Visa Cash card.⁹⁶ The product was launched in May. Near the end of July, Visa announced that during the month, consumer transactions numbered 98,961 for a total value of \$372,622, with more than half of the volume occurring in the first five days of the Games.⁹⁷ Forty-two hundred merchant terminals were deployed at 1500 merchant locations around the Atlanta area, including Olympic venues, convenience stores, gas stations, movie theaters, the Atlanta airport, pay telephones, light rail rapid transit turnstiles, and fast food delivery operators.⁹⁸ Visa Cash cards were issued in denominations from \$5 to \$100. First Union alone intended to issue 700,000 cards with various art designs and face values. Wachovia Bank was planning to issue the fewest cards at 100,000.⁹⁹ Initially, only disposable, non-reloadable cards were issued. Later, non-disposable cards capable of being reloaded at specially outfitted ATM machines were sold. By far, most of the cards sold through the end of the Games were of the disposable kind.¹⁰⁰

H. Seignorage

"Currency is that portion of the national debt on which no interest is paid."¹⁰¹ Modern day currency is issued by the FRB, but money has changed form many times as it has developed over the centuries. During the last century, currency having a value of one dollar or more has changed from a combination of specie¹⁰² and paper demand certificates—that were redeemable for a like valued amount of specie—to Federal Reserve notes and token coins. Viewed another way, the basis of currency has changed from valuable commodities to

95. See *Visa Cash Usage Soars During 1996 Summer Olympic Games* (visited July 26, 1996) <http://www.ramresearch.com/crdflash/cfr7_26aa.htm> [hereinafter *Visa Cash*] (on file with *The American University Law Review*).

96. See Church, *supra* note 94.

97. See *Visa Cash*, *supra* note 95.

98. See *id.*

99. See Church, *supra* note 94.

100. See *id.*

101. MAYER, *supra* note 77, at 57 (quoting Her Majesty's Stationery Office, Report by the Comm. on the Working of the Monetary System 117 ¶ 345 (1959)).

102. "Specie" is defined as "[c]oin of the precious metals, of a certain weight and fineness, and bearing the stamp of the government, denoting its value as currency. Metallic money; e.g. gold or silver coins." BLACK'S LAW DICTIONARY 1398 (6th ed. 1990).

fiat money based on the full faith and credit of the Treasury of the United States. The amount of currency in circulation is modulated by the FRB as it conducts its monetary policy.¹⁰³

The production of currency entails only a nominal cost to the federal government because cost of its production is substantially less than its value when issued. Having received them in trade, no one would think of melting down Susan B. Anthony dollars in order to sell the metal, because the commodity value of the metal is much less than the value of the coin as currency. If it were not for its value as a collectable, no one would think twice about melting down a \$20 gold piece and selling the metal. The difference between the face value of currency and its cost of production produces a curious effect. That is, a holder of cash effectively is making a loan to the federal government in the amount of the difference. The time value of money is not lost; instead, it reverts to the federal government. The "government revenue from the manufacture of coins, calculated as the difference between the face value and the metal value of the coins," is called "seignorage."¹⁰⁴

When one holds digital cash, the time value of money likewise is not lost: instead, it reverts to the financial institution holding the funds that were loaded onto the card. In an open or three-party payments system,¹⁰⁵ these funds are held in a liability account at a financial institution for the benefit of the cardholder. In a closed or two-party payments system,¹⁰⁶ such as pre-paid telephone cards, these funds represent prepaid services contracted for in advance by the cardholder.

With the growth of stored value systems, there is a concern that the federal government could experience a significant loss of seignorage. In a recent speech, Vice Chairman Alan S. Blinder, of the FRB, noted:

Let me start with a potential revenue issue that will arise if the stored value industry grows large. The federal government

103. See *The Future of Money—Part 2: Hearing*, *supra* note 87, at 71-72 (statement of Alan S. Blinder, Vice Chairman, Board of Governors of the Federal Reserve System). Vice Chairman Blinder testified:

Concerns have been expressed that introducing what amounts to a form of private currency might damage the Federal Reserve's control of the money supply and lead to inflationary pressures. I can assure you that this is most unlikely. The Federal Reserve currently issues or withdraws currency passively to meet demand, adjusting open-market operations accordingly to keep monetary and credit conditions on track. We would presumably continue to do this if private parties began issuing electronic currency which reduced the demand for paper currency.

Id.

104. WEBSTER'S NINTH NEW COLLEGIATE DICTIONARY 1063-64 (1984).

105. See *supra* note 10.

106. See *supra* note 10.

currently earns substantial revenue from what is sometimes referred to as "seignorage" on its currency issue. In effect, holders of the roughly \$400 billion of U.S. currency are lending interest-free to the government. In 1994, for example, the Federal Reserve turned over about \$20 billion of its earnings to the Treasury, most of which was derived from seignorage on Federal Reserve notes.

If some U.S. currency were replaced by stored value products—which are private monies—this source of government revenue would decline. Indeed, one of the major economic motives for institutions to issue prepaid payment instruments is to capture part of this seignorage, just like issuers of travelers checks do. Because the demand for stored value products and the degree to which they will substitute U.S. currency currently are unknown and impossible to estimate, the loss of seignorage revenue is likely to be small, but this concern should be monitored by Congress.¹⁰⁷

II. RECOMMENDATIONS

A. *Allow Stored Value Systems to Evolve as Dictated by Market Forces*

It is clear that electronic stored value payments systems are in the embryonic phase of development. Much of the applied work being conducted today is experimental and is not necessarily restricted to technical and operational issues. The industry is trying to explore and confirm models to show that there is a business case for these new payments systems.

Many influential industry participants argue that government regulation of stored value systems is premature and should not occur until the salient issues of these systems are understood and a clear need for regulation is established.¹⁰⁸ Only then can regulation, if necessary, be accomplished in a measured and informed manner: premature regulation could stifle further innovations in stored value technology.¹⁰⁹

107. *The Future of Money—Part 2: Hearing, supra* note 87, at 63 (statement of Alan S. Blinder, Vice Chairman, Board of Governors of the Federal Reserve System).

108. See generally Comment Letter from Kurt Helwig, Electronic Funds Transfer Association, to Board of Governors of the Federal Reserve (Sept. 6, 1996) [hereinafter "EFT Ass'n Letter"] (on file with *The American University Law Review*) (discussing Electronic Funds Transfer Association's reaction to proposed amendments and noting that technology still is developing and therefore, regulation is premature); Comment Letter from James H. Hayes, Smart Card Forum, to Board of Governors of the Federal Reserve System (Sept. 17, 1996) (on file with *The American University Law Review*) (discussing stored value cards, operation of Regulation E, and potential extension of Regulation E to stored value card systems).

109. See *The Future of Money—Part 4: Hearing, supra* note 76, at 228 (statement of David Boyles, Senior Vice President, New Business Ventures, Stored Value and Smart Card Center of

For instance, under a strict interpretation of Regulation E as it stands today, receipt printers might be required on newspaper stands, soda vending machines, and parking meters. A monthly statement detailing every transaction made at each of these points of sale would have to be produced and furnished to the cardholder.

The FRB is trying its best to approach these issues in an evenhanded manner. It recognizes the tension between promoting the development of the payments system and providing adequate supervision for safety and soundness and adequate consumer protection.¹¹⁰

According to the Federal Reserve Bank of Saint Louis:

As a central bank dedicated to the principles of free markets and private enterprise, the Federal Reserve has a responsibility to let market forces, by and large, shape and determine change in the payments system. Even so, at times the Fed may encourage developments that promote the public welfare or discourage others that aren't in the public's best interest. It will protect the public's confidence in the payments system by participating as a provider of certain services and by supervising and regulating various participants, but, most importantly, by exercising leadership. The Federal Reserve will share its knowledge and use its unique position to encourage participants to work together in the interest of maximizing the nation's economic welfare.¹¹¹

This statement seems to imply that the FRB has a claim to "special knowledge." It is unclear, however, how the FRB can know which developments will promote public welfare or implicitly know, with a reasonable degree of certainty, which developments are not in the public's best interest.

B. Provide Regulatory Relief to Closed Payment Systems

Most of the payment systems used in daily living are open financial systems where buyers and sellers transact, but a financial intermediary assists in providing the means to promise, finance, and settle payment.

Excellence, American Express); *The Future of Money—Part 3: Hearings Before the Subcomm. on Domestic and Int'l Monetary Policy of the House Comm. on Banking & Fin. Servs.*, 104th Cong. 69 (1996) (statement of Frank Wobst, Chairman and CEO, Huntington Bankshares, Inc.). One panelist at the September 19, 1996, Treasury Conference argued that "the industry is too new. Rigid rules may stifle the development of the industry, which is still evolving." *Concurrent Session: Privacy Issues*, in *TOWARD ELECTRONIC MONEY*, *supra* note 10. Another panelist disagreed and stated that "adopting rules while the industry is new would be more cost effective than attempting to [do so] later, after millions of dollars have been spent." *Id.*

110. See generally *FEDERAL RESERVE BANK ST. LOUIS ANN. REP.*, *supra* note 88, at 15 (explaining FRB's role in establishing new payments systems).

111. *Id.* at 17.

If transactions take place in the form of legal tender currency, the FRB serves as the financial intermediary. If checks or payment cards are used, a bank or other financial intermediary provides these services.

In the special case of closed systems, the party fulfilling the role of seller also provides the services necessary to settle payment. These systems may be large scale and relatively impersonal, like a telephone pre-paid payment card, or small scale and personal, like university campus card systems.¹¹²

The important distinction between open and closed systems is the relationship between the buyer and the seller with respect to the payments system. In an open system, the sales transaction is bifurcated; however, the transfer of goods from seller to buyer remains unchanged in both closed or open systems. Because of the static nature of the closed payment systems, many industry associations argue that closed stored value systems should be excluded from regulation. As the Electronic Funds Transfer Association stated:

The Association . . . believes that "closed" stored value systems should be excluded [from regulation]. These are systems in which the card represents a prepayment of goods or services of the issuer only. The Association does not believe they represent fund balances any more than gift certificates. These cards, which may be on-line, off-line or both, may be very convenient to many types of business and consumers The Association believes the market will provide adequate protections, particularly as the merchant/provider of services has every economic reason to keep its customer happy.¹¹³

C. *Regulate Stored Value Based on Function Not Implementation Technology*

First, on-line stored value systems are closest in implementation technology to electronic debit card systems. Second, these systems, by virtue of their implementation technology, have the ability to

112. See *Prepaid Calling Card History* (visited Feb. 20, 1997) <<http://www.uald.com/history.html>> (on file with *The American University Law Review*). "The first prepaid calling card was introduced in Italy in 1976. Today, the cards are widely used in over 150 countries. The cards are available almost everywhere, including vending machines, stores, and post offices." *Id.*; see also Danielle Arnet, *Phone Cards Ring Up Big Bucks*, U.S.A. TODAY, Aug. 25, 1993, at 4B (suggesting that telephone cards are the "techno-collectible" for the 1990s.); Betsey Wade, *Debit Calling is Coming—Advantages of Paying in Advance Seem to Outweigh Advantages of Credit Card Calls*, CHI. TRIB., July 11, 1993, at 16 ("In Japan, the cards are so common they are given away as souvenirs, including at funerals.").

113. See EFT Ass'n Letter, *supra* note 108, at 6.

support the additional consumer protections outlined, whereas off-line systems, especially off-line unaccountable systems, do not.

For example, on-line systems, by virtue of operating with a centralized database, can provide consumer protection features currently required by Regulation E that are either difficult or impractical to provide with off-line systems. Furthermore, on-line systems have the data to support these features under dedicated operational management. These features include periodic statements, provision of transaction history on request, error resolution procedures, and provisional recredits for alleged errors. Arguably, if an off-line payments system works perfectly, the consumer does not need a statement, because she can get the transaction history and balance the card. Under current card technology limitations, however, the transaction history file is short. No system is perfect, and errors will occur. The issues of error resolution and recredits certainly could be problematic if the only source of information from which to make determinations is the consumer's card itself.

On its face, this treatment is prejudicial to on-line systems in favor of off-line systems. This effect is likely to result in a bias for the natural market forces operating to determine the ultimate product mix and acceptance of these various systems. On-line systems may see a smaller market penetration and acceptance than they would have, all other things being equal. Of course, the converse is true for off-line systems. These stored value systems are providing the same features to the consumer and, therefore, should be treated alike for regulatory purposes.

CONCLUSION

Stored value systems provide an important functional niche in the scheme of electronic payment systems. With appropriate regulation based on both functionality and community of use, rather than on implementation technology, these systems can reach their fullest potential in the new era of electronic commerce.