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Will Electronic Money Be Adopted in the United States?

by Barbara A. Good

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Although the cashless society has been predicted for at least twenty years, the new forms of card-based and software-based electronic money may prove to be a partial alternative to the current forms of payments. This paper examines their possible adoption, primarily in the United States.

Determining what will trigger the adoption of these emerging electronic payments methods is of significant importance to the developers and marketers of the products. The accelerating speed of acceptance of technological advances may help to make these new systems viable in the payments world. The desire by consumers and businesses to conduct purchases on the Internet will also drive acceptance of these emerging payments. The vast potential revenue from these products will push their development and marketing by the issuers .

Based on the findings of this study, six conclusions regarding prospects for electronic money systems in this country are discussed.

1. Electronic money systems will slowly be adopted by U.S. consumers as an additional payments method.
2. Those electronic money systems that are most “like cash” will more likely be accepted for non-Internet purchases.
3. Technology acceptance is accelerating and this will speed the adoption of electronic money systems.
4. Stored-value cards that offer multiple applications, including incentives, are more likely to be accepted by consumers.
5. Acceptance by European and Asian countries, as well as the developing countries, will push acceptance in the United States.
6. The market for electronic money systems should be allowed to develop on its own without government interventions.

In the 20th century, science and technology have dramatically changed how people live their lives and conduct business. These changes have touched virtually all Americans and all aspects of our lives. What is even more amazing to ponder are the changes that are yet to come. More new technologies are coming to the market faster and being adopted by an increasingly technologically savvy public than ever before.

By examining a number of yesterday's inventions we are able to see that these inventions have conditioned and enured us to change and that acceptance of new technologies is accelerating. The following table[1] shows that the time it has taken for new technologies to reach a quarter of the U.S. population has been accelerating.

Table 1: Accelerating Acceptance of Innovations

Date	Invention	Yrs. Before Mass Use
1873	Electricity	46 years
1876	Telephone	35 years
1886	Gas Automobile	55 years
1906	Radio	22 years
1926	Television	26 years
1953	Microwave oven	30 years
1975	Personal Computer	16 years
1983	Mobile phone	13 years
1991	The Web	6 years

Source: National Center for Policy Analysis

With the introduction of electronic money systems, in both the card- and software-based forms, technology may once again change our lives, or at the very least, how we view money and make payments. Although these new money systems have not

yet gained acceptance in the United States, they have made significant inroads in other parts of the world, especially Europe and Asia.

Money, in the form of currency and coin, has had a long and varied history in cultures and societies. The changes that may result from the acceptance of electronic money could affect the manner in which money is viewed, used and counted. These changes could have major implications for both society and those corporate and government entities who are stakeholders in the status quo. Those entities who are currently in control of the payments systems in cash, check, "plastic", or electronic form, will want to continue to play a role in these new payments methods.

But, what are these new electronic money systems and are they really different from those systems we already use? Will they be accepted by consumers and merchants? Will they change the way business is conducted? Will they change the structure of society? Will they be safe to use? No matter what the new technology, many of the questions regarding new technologies are the same. In order to begin providing some answers to these questions, this study was undertaken.

Almost daily one can find articles about these new money systems in the business press, and just recently there have been numerous articles in newspapers and news magazines. As pilots are conducted, closed systems launched, and alliances built between companies, more and more of the U.S. public will become aware of these systems and have to make the decision as to whether they will adopt these new forms of payments.

As the world has changed through the introduction of new technologies, so has the concept of money. Today, money is perceived as a yardstick value, a unit of account. The vast sums of money that are exchanged on a daily basis have changed the way money is viewed. Money is no longer only in the form of paper, but is often only an electronic blip, an accounting entry. On average, more than $1 quadrillion is transferred on a daily basis electronically over Fedwire, the Federal Reserve System's wire transfer network, primarily by corporations and banks.

Many of us are paid by direct deposit, an accounting entry that moves money from the employer's account to our own. The new forms of electronic money take this concept one step further, as they try to replace even more of the paper and metal forms of money in society. This is truly the first time in monetary history that electronic-based money systems are widely available to the public. These systems will bring to the consumer ways to move funds electronically, just as corporations and banks do today, albeit on a smaller scale.

The emerging electronic money systems can be either card-based, using smart cards, or software-based systems, sometimes referred to as cyberpayment systems.[2]

The terms "stored-value card" and "smart card" will be used interchangeably, although there are some technical differences between the two; both can be either a single or multi-purpose card with chip-based technology. These cards can function in either a closed system or open system. A typical closed system would be a transit system, such as the Washington, D.C. Metrocard system, or a university smart card that

functions as identification, library card, copy card, meal and parking pass. An open system would generally be a larger merchant community that accepts the card for payment as though it were cash, check, or any magnetic stripe card, such as a credit or debit card.

These cards are predicted to grow at dramatic rates over the next five to ten years. One forecast predicts that smart card demand will reach $1.6 billion by 2001.[3] The following table shows one breakdown of the types of cards forecasted to be used by application. Those noted as transaction applications are the ones that would be the electronic purse stored-value cards that will be discussed in more detail throughout the rest of this study.

Table 2: U.S. Smart Card Market by Application (million dollars)

Item	1992	1996	2001	Annual Growth 96/92	Annual Growth 01/96
U.S. Smart Card Products Demanded	51	145	1550	30%	61%
Transaction processing	5	15	575	32%	107%
Identification & security	20	50	400	26%	52%
Communications	Negligible	10	250	--	90%
Government	22	50	150	23%	25%
Other	4	20	175	50%	54%

Source: The Freedonia Group, Inc. Cleveland, Ohio

In addition to the card-based systems of electronic money, the world of electronic commerce opens up a whole new market for making payments over an open system like the Internet. Software-based electronic money is projected to become the preferred

method for these payments. The market for on-line purchases is forecast to soar to $16 billion in the United States and Europe in 2002, according to the Datamonitor research firm. This is significant growth from 1997's total, estimated between $300 million and $500 million.[4] This is considered to be a conservative forecast, as other research companies have projected much higher markets. Jupiter Communications of New York has predicted that electronic commerce will be worth $37.5 billion by 2002, while Forrester Research of Massachusetts has projected the market to be $66.5 billion by the same time.[5] No wonder companies are interested in finding a way to provide safe, secure, and reliable payments to this emerging market.

One reason that the electronic commerce market is predicted to grow so rapidly is the proliferation of personal computers in U.S. households. Although you do not need a PC to access the Internet, that is the way most users are accessing the Internet today. Web TVs were introduced in late 1996, and other access technologies may be developed, but PCs remain the primary access device. The following table shows the projections for households with online capabilities, giving some credence to the projections for electronic commerce.

Table 3: Projections of Personal Computers in U.S. Households[6]

	1996	**1998**	**2000**
U.S. Households(millions)	98.9	101.0	103.2
Households with PCs	38.7	47.8	55.1
Households with PCs and modems	27.2	42.0	51.4
Online households	14.7	27.3	36.0

Source: Jupiter Communications
1997 Consumer Internet Report

The acceptance of these new payments methods have some analogies historically, as the United States has experienced a number of different payments methods. Although electronic money systems are more evolutionary in nature, earlier payments innovations help to establish parallels and determine lessons that can be learned from the adoption of these methods of payment.

According to a recent article, money is a system of thought, a way of organizing social behavior, and an integral part of modern culture, but money need not necessarily be an object.[7] This view is different from the traditional one that many studies of money have focused on. Much research and analysis has been done based on money and its definitions and even the more traditional functional view fits the electronic money systems. The three traditional functions attributed to money are that it be a medium of exchange, a unit of account, and a store of value. Electronic money fulfills these three functions.

The potential transition to electronic money raises a number of different types of issues — political, economic, social, and legal. As with all new systems, there are both positives and negatives, up sides and down sides. It may be years before all the issues are sorted out in an acceptable manner.

Notes on Methodology

A hurdle to be overcome in studying electronic money systems is that there are basically two types of problems to be addressed. The first problem involves determining

the fundamental properties from which electronic money derives value and understanding the obstacles that may inhibit adoption. The second is keeping track of the different incarnations of these evolving instruments and dealing with the chimeric nature of these systems. On an almost daily basis, there are press announcements made, new alliances formed, and new trials begun and old trails ended, while those underway are continually scrutinized. Very little academic research has been conducted in this emerging area, and that which has been done quickly becomes less valuable as the playing field changes, as well as the product. Predictions of the adoption rate and market for these products range all over the spectrum.

Conferences are the primary method by which dissemination of information occurs, and thus attendance at conferences was a major part of the research effort. The business press provided extensive amounts of information, and was used to keep up to date on the changing nature of the products and the players. The Internet proved to be an exceptionally rich resource on types of products and descriptions of pilot programs. Personal conversations with the major players in the industry were also a source of future plans and "inside" information on the trials and their successes and failures. This is an area that is ever-changing and always interesting.

The future of these new products is still unknown, but then the future never is known... until it has become the past. However, the past may have given us some direction for determining the future of these products.

A new technology brings with it not only the potential for success, but also a

never-ending series of questions regarding its design, its value to the user, its ultimate use and acceptability. There are many questions that are still to be answered by the designers, issuers, and regulators of these devices. This innovation has the *potential* of changing the retail payments arena in a way that has not happened since the advent of the credit card. But at this time, it is still *only* potential.

The Future of Electronic Money Systems

There are a plethora of forecasts available that predict every possible scenario for electronic money systems in the United States. Some predict that cash is dying and will be completely replaced by the electronic purse stored-value systems; other studies state that there will never be a high level of adoption of the systems in this country. Other studies predict every instance in between.

An entire consulting industry seems to have developed overnight that monitors and analyzes each new development on both the technological and marketing front. Each of these companies are also out there selling their expertise in the analysis of what is going to happen with this new "money". Or they are putting on conferences and seminars to try to get the excitement building regarding these products they have been following and analyzing.

In three short years, we have gone from an occasional article in the business press about smart cards to be being bombarded on a daily basis with new ideas, new technological advances, and new alliances of companies. The amount of time, effort, and money that has gone into these projects is simply mind-boggling. And yet, we really

still don't seem to have seen any significant progress to winning over the hearts, minds, and wallets of the American public.

Stored-value cards seem to be gaining popularity almost everywhere in the world, except in the United States. There is much theorizing being done to try to explain this situation and the most prevalent of those theories will be examined. The next section will analyze what is different in the United States that may impede or enhance the acceptance of electronic money and will make some broad conclusions regarding the future of electronic money systems.

Are Americans Different?

For hundreds of years, social observers starting with De Tocqueville have been writing about how Americans are different. And in an ever increasingly global melting pot, people are still talking about how Americans continue to be "different." In a recent interview with Roland Moreno,[8] the man credited with the invention and development of the smart card, he stated many times that America is very different from his native France. He used not only examples dealing with the larger infrastructure issues, such as the number of financial institutions in the United States versus other countries, but also stated other observations regarding the differences between the French and the Americans. Specifically, he stated that no one in France would wait in line to pay for something in the manner that Americans do and then described Americans as patient and disciplined. This was one of the primary reasons he felt that stored-value and other smart cards were being adopted less quickly in this country. These insights are interesting, as

they neglect some of the major technological advantages that are prevalent in this country. Americans take for granted their efficient, functioning, and relatively low cost communications network. That communications network allows Americans to expect a level of service from an efficiently operating retail payments system that is quite different from those in other parts of the world. The U.S. system allows the processing of credit and debit card transactions to be achieved quickly and at low cost to the merchants.

A recent article in the Washington Post [9] stated that experts believe that smart cards have gained faster and wider acceptance in Europe due to a number of factors, especially noting these differences in telecommunications systems. Telephone systems are much more expensive in Europe than they are in the United States, allowing U.S. merchants to accept credit cards both more reliably and less expensively than their European counterparts. These experts feel that the smart cards have been embraced in Europe as smart card transactions do not require authorization via the telephone network.

The infrastructure of the financial industry is considered another major factor for the higher acceptance of smart cards in Europe, as only a handful of banks control consumer banking accounts, making it easier to agree on standards as well as to concentrate marketing efforts. In the U.S., there are many different players with many differing ideas which could be stifling the development of stored-value cards.

Psychological barriers were also cited; Americans have embraced credit cards because they are "easy to use, allow deferred payment and carry benefits such as accrual

of much-touted frequent-flier points." Although cash is preferred by Americans for small transactions, the value of these transactions is low compared to other payments methods in this country. In fact, smart cards have been compared to the metric system, a fixture in Europe, but largely ignored in the United States.[10] Not a very promising comparison for the issuers of these cards.

Privacy concerns are often cited by consumers in surveys conducted regarding electronic money. Americans jealously guard their privacy and the anonymity of cash transactions is often cited as a benefit of using cash. Cash is also often used to avoid the sales and income taxes by some consumers, and there is significant anecdotal evidence that the underground economy in the United States is a direct result of the anonymity and lack of a paper trail that cash provides. Although these concerns and benefits are not all that different from other cultures, they are of high importance to many American consumers.

Payments in the United States

As money technology has evolved, methods of payment have also changed, but cash still often remains a preferred method of payment by many people. Over the past few decades various media and industry experts have predicted the demise of cash and the advent of the "cashless" society. However, survey results show that the preferred form of retail payments by consumers and merchants is still cash, as presented in the table below. Retail payments are defined as those made by consumers, rather than corporations or government agencies.

Table 4:

Preferred Forms of Payments by Consumers	
Cash	54.2%*
3rd Party Credit Cards (i.e., Visa)	38.5%
Check	23.4%
Store Credit Cards	6.5%
Debit Cards	1.0%
Other	1.1%

*Percentages will not add to 100%, due to format of questions asked.
Source: Survey conducted by Ernst & Young, Business Week, 4/8/96

The survey showed also that 58% of retailers had a preference for cash transactions.[11] Cash is used most often at food stores, for purchases at gasoline filling stations, and for dining out. The reasons given for using cash were that 1) it is convenient for small, inexpensive purchases, 2) force of habit, and 3) the recipient preferred or only accepted cash.[12]

The number of cash purchases far exceeds any other payment method, although the value of cash purchases accounts for less than 20 percent of the value of total retail transactions. The Congressional Budget Office has estimated that cash payments account for approximately $1 trillion of consumer expenditures (roughly 20 per cent of net consumer expenditures of about $5 trillion). This means that for every 1 percent of cash transactions that were replaced with stored-value cards, issuers would sell $10 billion worth of cash balances on the stored-value cards.[13] It is no wonder that the major

players in this new payment form wax so enthusiastic about the prospects of their devices. These cards could replace a portion of the cash transactions, the checks written, and possibly the credit card purchases if they are accepted by the consumers and merchants, and if they are designed in a way that replicates what people like most about cash in a more secure and convenient form.

Even assuming that stored-value cards capture only a small fraction of their targeted markets, the potential of the market for stored-value cards has been estimated to be roughly the size of the market for traveler's checks - $20 billion transacted annually. [14]

While the use of cash accounts for less than one percent of the value of total retail and whole U.S. payments[15] (the average daily value of Fedwire transactions only exceeded 1 quadrillion in 1997) , most retail payments in the United States are still made with cash. The U.S. Department of the Treasury estimates that cash is used for roughly 75% of retail transactions in the United States. Cash use is even more prominent in most other developed nations.[16]

In a recent study of the use of cash by different countries, there is a marked difference in the pattern of cash usage in the United States when compared with Europe and Japan. The use of cash in the United States is considerably lower and the use of the current electronic payments systems greater.

Table 5:

Indicators of Cash Use, 1993[17]

	Cash/M1	Cash/GDP
United States	.11	.02
Europe	.14	.04
Japan	.27	.08

Note: U.S. cash holding have been restated to exclude estimates of U.S. currency held abroad.
Source: Hancock and Humphrey,1998.

As can be noted from the following table, the use of paper versus electronic payments remains fairly constant across the United States, Europe, and Japan, with the main difference being that in Europe and Japan the paper instrument is likely to be cash, while in the United States the paper instrument is more likely to be a paper check. The reliance on the paper-based retail payments methods is striking in an electronic age.

Table 6:

Retail Payments Methods [18]

	Cash vs. Noncash % of Retail Payments		**Paper vs. Electronic % of Noncash Payments**		**Paper vs. Electronic % of Retail Payments**	
	Cash	Noncash	Paper	Electronic	Paper*	Electronic
U.S.	75	25	78	22	94	6
Europe	76-86	14-24	37	63	85-91	9-15
Japan	90	10	22	78	92	8

*Includes transactions paid by cash, check, or paper-based giro.
Source: U.S. Treasury, Bank of international Settlements, correspondence with central banks, and others.

The Market for Electronic Money

Although there has been a tremendous push from the industry and the government for the use of electronic payments, there has been a lukewarm response from consumers to the electronic payments methods**.** Consumers seem to be quite contented with the payments products they currently have available to them. And although there appear to be a number of successful European roll-outs of stored-value systems, it is still questionable whether there will be the same successes in the United States.

One area where consumers do not seem to be content with their current payments methods is when purchasing goods and services over the Internet. This is the area that many experts feel will drive the use of electronic money systems that are either card- or software-based.

Roland Moreno stated that he viewed the main functions of a smart card as giving identity, containing money, and securing a payment. [19] These are some of the necessary components of conducting payments over the Internet and according to Bill Gates, smart cards are a key element in removing obstacles to electronic commerce. "The security issue — knowing who is communicating with you will be crucial to realizing the commercial promise of the Internet."[20] Gates feels that in the United States, smart cards will have their first impact in simplifying security on the Internet. Many experts agree that the consumer demand for stored value will come from the desire to make payments over the Internet, not the more traditional channels where there are an abundance of payment methods that work well today.

These views are not radical or new. In a country that has a well developed and relatively sophisticated payments system, there must be significant value perceived by adding an additional method. A new method must be perceived as having value before consumers will be willing to commit to it. As the following table shows, there does not appear to be a significant improvement in the consumer's perspective over the last payments innovation, the debit card. The advantages seem to be much more heavily weighted towards the banks and merchants than the consumer. In fact, almost all of the disadvantages seem to be affecting the consumer.

Table 7:

Stored Value vs. Debit Cards — Pros and Cons [21]

	Advantages	Disadvantages
Banks	-Interest on float of prepaid amounts - Risk of fraudulent use transferred to consumer -Depending on system, issuer can retain unused money on lost cards -Depending on system, reduction in number of transactions that need to be processed	- Requires new systems to handle stored value transactions
Merchants	-Slightly faster transaction times, since no PIN is required -Eliminates the need for blacklist to be maintained at merchant site	
Consumers	- Slightly more convenient, since no PIN is required	- Must be prepaid; consumer loses float on money - Risk of loss and theft - Card must be reloaded periodically - User must keep track of balances on card.

Source: The Tower Group

There are, however, some other reasons that stored-value cards could be adopted by consumers in the United States. As stored-value cards become better known and

better understood, consumers may see more value in them and become more willing to adopt them. As the electronic money systems gain capabilities with newer, more powerful chips and more multi-application systems are developed, card-based systems may become more useful, especially as they become more readily usable on the Internet**.**

Costs of chip-based cards are dropping, with some selling for $2.00; although they may never be as cheap as magnetic-stripe cards, lower prices will make the deployment of the cards more widespread. The chip-based cards may be used for debit and credit applications, not just stored-value applications, which could lead to more powerful multi-application products in the future.

As closed stored-value systems become more prevalent, such as those currently being used on college campuses and military bases, there will be an ever-growing segment of the population who has used these payments methods. Depending on the nature of that experience, these consumers may also push for more open systems of stored-value. And due to the broad diversity of consumers using these system, both on the college campuses and military bases, these consumers may be more representative on the whole than the consumers involved in the pilot programs in places like Manhattan. This could accelerate the diffusion rate throughout different social systems simultaneously.

The fact that the computer industry is working together to set, establish, and promulgate standards could provide more impetus for the adoption of these system. Developers are becoming more familiar with the cards and the languages that are used to

program the applications on the cards, thereby making more numerous and more diverse applications possible.

Much of the rest of the world is already using smart cards, including many developing nations that lack the infrastructure needed for credit and debit card systems. This widespread popularity could advance adoption in the United States in a manner similar to how the credit card systems migrated to the rest of the world from the United States, so could the smart card systems migrate to the United States.

Lessons from the Introduction of Credit Cards

One of the payments methods which has had the greatest impact on the way Americans pay for things is the credit card. When credit cards were introduced in the late 1950s, their ultimate potential could not have been imagined. Today, more than 75% of the people in the United States have a credit card, and more than 80% of these card holders use their cards on a monthly basis.[22]

Prior to the widespread availability of credit cards, most people either saved the money required for large purchases and then purchased the good or service, or arranged for an installment loan through a financial institution. With credit cards, they could decide to exercise the credit privileges associated with the card by making purchases prior to having the necessary amount of money on hand and choosing to pay when the bill was received, often with no interest charged, or paying the balance off over an extended period of time and paying the interest charged by the card issuer. The introduction of the credit card may be considered a revolutionary payments option as it

changed the very nature of debt in this country, as well as creating a form of "near money".[23] One economic analyst called the credit card the "democratization of debt" [24].

Until the 1960s, bank credit card programs were primarily local in nature. Most banks were initially reluctant to adopt even these local credit card plans due to the paradigm shift that such adoption required; philosophically, the institutional attitude towards consumer credit had to change. With a credit card, qualifications were minimal and the "cardholder was given a credit limit within which he controls the amount, use, and timing of loans. This is contrary to concepts bankers have been accustomed to for years." [25] Banks had traditionally maintained complete control over credit, and approved credit transactions on an item-by-item basis. Although the additional risk of credit cards was compensated for by higher interest rates and the fees charged to merchants, banks were not interested in offering these plans until competitive pressures among banks pushed the widespread acceptance of these national credit card plans. Interestingly enough, it was often the smaller and medium sized banks that were interested in these credit cards, as the larger city banks were more oriented toward the business and real estate loans, rather than consumer installment loans.

With credit cards, financial decisions regarding credit privileges were placed in the hands of the consumer. This concept was new and downright revolutionary. Could consumers handle this newfound responsibility? Would the banks be able to make money by offering these credit cards? Would consumers and merchants accept these cards? Basically, the answer to all three questions was a strong yes.

Although the cards were not accepted by a large number of merchants initially, as the critical mass of cards and the necessary authorization devices became cheaper, more and more merchants began to accept the card. As the cards became available to more people, their popularity increased. This adoption also spread to other parts of the world, albeit more slowly than in the United States. Credit cards are still not as popular in other parts of the world due to a number of reasons, including the need for a reliable, low cost telecommunications network for authorization of transactions. However, as travelers began to expect the cards to be as widely acceptable worldwide as they were in this country, the adoption rate in other countries increased. Network externalities were achieved and the card could be used for purchasing goods and services in what seemed like an ever increasing number of places.

Convenience factors such as ease of use, deferred payment, and even frequent flier miles have made the credit card ubiquitous in the United States payments arena. The success of credit cards has been attributed to the credit feature of the card more than the convenience aspect by most consumers.[26] This does not bode well for stored-value card systems that are promoting their convenience features to consumers. Nonetheless, most consumers now are both familiar and comfortable with using the cards to pay for purchases, eliminating one major impediment that credit cards faced.

Stored-value cards are more evolutionary than revolutionary. They are a replacement, at least in the United States, for payment systems which most people think work just fine already. They also require that consumers have the cash on hand, or on the

card at least, in order for purchases to occur. For small value purchases they may replace cash, paper checks, and/or small credit card purchases, but most cards are not designed for larger purchases, as they have low maximum values that can be stored on the card.

Although most persons think of credit cards as quite modern, they are approaching a 50th anniversary, as the Diners' Club card (a charge card) was first introduced in 1950. This was a time of economic stability, much pent-up demand as a result of World War II, and was in the midst of the Baby Boom. The social and economic climate was ripe for payments innovations**.** And credit cards filled the niche in a way that no one could have expected.

"It is important to remember that the credit card industry developed almost entirely as an American innovation designed to fit certain economic, social, and technological characteristics of this country." [27] When credit cards were introduced and first began to gain popularity as a payments method, the U.S. was experiencing exceptionally robust economic growth. Consumers were able to tap into more disposable income, and with the emergence of new technologies, such as televisions and microwave ovens, more and more diverse goods and services were available to be purchased. Consumers were optimistic and that optimism spread over to the idea that they would always be able to make the payments and improve their standard of living each year, well into the future. This was also the time when home ownership became a reality for larger and larger groups of Americans, and as most people know, purchasing a house is only the beginning of the purchasing cycle. Houses always seem to need something.

Benefits were derived by virtually all participants in this new payments method. Although there were some people unable to handle the responsibility of making their own credit decisions, the higher interest rates compensated for that risk. The higher interest rates coupled with merchant fees made these cards attractive fee income generators for the banking industry. Consumers were able to have almost instant gratification of their purchase desires and were in control of their financial decisions.

Electronic money systems, as they are designed today, continue this trend in an evolutionary manner. The systems allow purchases, whether card-based or software-based, to be accomplished with minimal intervention by the financial industry after the initial loading of the value. In fact, in the systems that allow purse-to-purse transactions, there could be virtually no interaction with the institution, depending on the number of places where the card could be used.

Since the majority of consumers are used to paying for goods and services with "plastic" money, the electronic money systems are merely an extension of that concept. Vast sums are transferred by electronic methods daily by corporations and banks, and now consumers can take advantage of similar electronic methods.

One drawback to electronic money systems involves who benefits from these systems; in most cases, the most tangible benefits accrue to the issuing institutions and the merchants. It is harder to assign a value to the convenience benefit of the consumer and as most consumers understand the concept of float (which will accrue to the issuers of electronic money), the adoption rate of these systems may be slower than anticipated.

In addition, although credit cards allow consumers to purchase goods and services without having the money on hand, electronic money systems require the value to be stored on the card or the software system. For small value purchases, this should not pose insurmountable obstacles, but for most consumers, the use of coins and currency poses few hardships. When introduced, credit cards were truly a revolutionary concept, and in many ways can be compared to the uniqueness of the Internet.

Electronic money systems have the potential of growing, especially if purchases on the Internet continue at the rate that is expected. However, many consumers are using credit cards to make purchases, feeling that they are no less secure than ordering through a catalog over a telephone line. If credit cards can be made secure for use over the Internet, it is not likely that there will be a great demand for other forms of payment for consumers. Business-to-business transactions are different and will not be addressed here.

Conclusions

It is evident that there are many impediments that could slow down the adoption of this innovation. These impediments are not insurmountable, especially if consumers and merchants see the value of the products and issuers feel they can make money by offering them.

The conclusions regarding electronic money offered in this paper are a result of the study of the field as it exists today. As this is a constantly changing field, conclusions may change drastically based on technological advances, alliances that are formed, and

success of pilots and trials. An emerging technology can change quickly and many times as the developers rush to adapt the products to the needs and wants of the consumers, merchants, and other parties involved.

Based on my research and evaluation I have six conclusions regarding the diffusion of electronics money systems.

1. Electronic money systems will be adopted slowly by U.S. consumers as an additional payments method.

2. Those electronic money systems that are most "like cash" will more likely be accepted for non-Internet purchases.

3. Technology acceptance is accelerating and this will speed the adoption of electronic money systems.

4. Stored-value cards that offer multiple applications, including incentives, are more likely to be accepted by consumers.

5. Acceptance by European and Asian countries, as well as the developing countries, will push acceptance in the United States.

6. The market for electronic money systems should be allowed to develop on its own without government interventions.

Each of these conclusions will be discussed in more detail.

1. Electronic money systems will be adopted slowly by U.S. consumers as an additional payments method.

Stored-value cards will replace the smaller value coin and currency retail transactions, and will be used for purchases over the Internet. The driving reason for the adoption is the substantial potential value they have for two important groups of organizations, banks and businesses offering goods and services over

the Internet. The potential billions of dollars in profit for the banking industry and Visa and MasterCard corporations will drive the development of products that will excite and entice the consumer to use the technology.

For the banks, the initial value will result from the increased security and subsequent reduction in fraud that should occur from including chips on both credit and debit cards and the increased profit margins for the issuers. The real prize however is the float on the funds stored on the cards as this will provide significantly increasing revenues to the banks as use becomes widespread. As credit and debit cards with chips become more commonplace, consumers will begin to accept the idea of chip cards. Multiple use cards will help speed the adoption of this technology.

For businesses offering goods and services over the Internet, need for an on-line, secure, and reliable means to make payments over the Internet will drive demand. The value of the security in making purchases over the Internet should not be underestimated. Purchases using stored value cards offer that security. If the standards for secure on-line credit card transactions continue to be delayed, there will be a positive impact on the use of stored-value cards for Internet purchases. The electronic purse capability will be more important in the virtual world of the Internet where there are fewer payment alternatives available than in the real world.

Although these benefits accrue primarily to the issuers and businesses, adoption of these electronic money systems will occur. The adoption in this country will most likely be slower than in the European and Asian markets, as consumers receive few of

the benefits at this time (see Table 7). It is anticipated that these systems will provide an adjunct method of payment, rather than a complete replacement for coins and currency or any of the other current payments methods. Although the cashless society is not out of the realm of possibility, it is not anticipated that it will occur in the short term. What is most likely to occur is a slowed growth in traditional cash transactions with an accelerated growth in electronic money systems, roughly following the standard s-shaped diffusion curve.

Another force that will aid, but not drive, acceptance is the growing phenomenon of "closed" systems that use stored value cards. As "closed" systems on university campuses and military bases expose more and more consumers to the benefits of using stored-value cards, demand may well be accelerated. These consumers will be likely to accept similar "open" systems as they become available, due to their familiarity with the concept. The success or failure of these "closed" systems will help determine the continued adoption of the "open" systems.

Additional organizations that will benefit from the acceptance of electronic money systems are the government agencies. The government mandate for the "electronification" of all government payments by the end of 1999, has caused a rush to provide card-based electronic money systems for the payment of welfare benefits. Most states have either programs or pilots in some stage, and the first widespread use of reloadable stored-value cards has been the card that are replacing food stamp benefits. This initiative has required that food stores be equipped with terminals that will accept

stored- value cards, and therefore ensured that the infrastructure is already in place for the use of the cards in that retail venue. This will also help to speed the adoption process.[28]

2. Those electronic money systems that are most "like cash" will more likely be accepted for non-Internet purchases. Americans fiercely protect their privacy and do not want others to know what they are purchasing and from whom. Consumers want to know what they are spending and where they are spending it, they just do not want anyone else to have access to that information. This technology would allow consumers to track their spending similar to the way it can be done with a credit card, while maintaining the anonymity of cash. Those systems which most closely mimic the anonymity of cash will be the systems that consumers will be most comfortable with, at least in the early stages. Even though having personal and private records would add a value to these card-based systems, most consumers would not want a record of these transactions to be shared with any other organization -- whether it be the bank, the government, or a marketing organization.

For the same reasons that cash transactions concern law enforcement officials, these "cash-like" systems are also the ones that cause the greatest concern and there may be limits on the amount of value that can be stored on the card. Person to person (purse to purse) transactions would continue to allow the underground cash economy to continue in a similar manner to today, which also concerns tax agencies at all governmental levels.

The electronic money systems that are the most "cash like" are more likely to be accepted by consumers, as they combine the anonymity of cash with the convenience of using a modern up-to-date technologically advanced payments method. Which leads to the next conclusion.

3. Technology acceptance is accelerating and this will speed the adoption of electronic money systems. As these systems are accepted, they will reach a critical mass more quickly than credit and debit cards did historically. Consumers in this country are accustomed to using both kinds of cards, and that familiarity will help to increase the adoption rate for another kind of "plastic" money. The infrastructure can more quickly be put in place and the cost of loading devices, as well as POS devices, should achieve economies of scale which will make them affordable for both issuers and merchants.

As the examples in Table 1 pointed out, the acceptance time for new inventions has shrunk significantly during the past 100 years, and appears to be accelerating. Although television was invented in 1926, it took 26 years to reach a quarter of the population of the United States, while the Internet, introduced in 1991 has taken only 7 years to reach 25% of the United States population. This is partially due to the infrastructure that was already in place and partly due to the novelty of the new technology. The consumer who wants to purchase goods and services on the Internet is a wonderful target market for stored value cards. Young, educated, technologically adept, with disposable income -- they are the an ideal population. The emergence of the two

technologies almost in tandem, will promote the synergies of electronic money and electronic commerce. Both technologies will benefit and this should serve to accelerate the rate of adoption for both.

Currently most access at this time is accomplished through personal computers and Web TVs and as these devices are becoming cheaper, and the market will continue to grow. The demand for a way to purchase goods and services through the Internet is only in its infancy stage. As it continues to grow and expand ways may be developed to allow purchases to be made in the future through card-based systems or hybrid systems.

If the projections are even close to being accurate, more electronic commerce will be conducted over the Internet each year for the next ten years, by an ever growing number of consumers. Those consumers will want to have a choice in the methods of paying for those goods and services that is secure and reliable. This desire to make purchases over the Internet will make the acceptance of electronic money systems occur at an increasing rate.

4. Stored-value cards that offer multiple applications, including incentives, are more likely to be accepted by consumers.

The value of these systems must be perceived by the consumer and having cards with multiple uses will help to create the value to the consumer. However, the number of applications should be limited so that loss of the card does not cause undue hardship and inconvenience to the consumer.

Various forms of lifestyle cards have been suggested, such as a card that is used

for travel, containing multiple currencies in the electronic purses, passport numbers, frequent flier miles and hotel profiles, and emergency medical information. Additional cards could be used for parking, driver's license information, insurance information, and local loyalty programs. The variations are almost limitless, if the cards are accepted as being of value to the consumers. This is where the ingenuity of the marketers, in interaction with the consuming public, will determine the specific characteristics that will spark consumer's imagination and excite people about the technology.

These additional applications that stretch the functions of the systems beyond their use for small value purchases should provide the added value and convenience that makes consumers desire to carry them in their wallets.

5. Acceptance by European and Asian countries, as well as the developing countries, will push acceptance in the United States. The push will be similar to the adoption of credit cards in Europe and Asia, following the widespread acceptance of the cards in the United States and the expectation of travelers that these payments methods would be accepted worldwide.

With the introduction of the Euro, the European lead in smart cards could increase dramatically. A card that can hold a single currency that can be used across the European Union will have a broader appeal to consumers and will allow greater network economies to develop. Although the United States is still expected to lag both Europe and Asia, the widespread use of stored-value cards in those areas is expected to drive the demand for the cards in the United States, especially for Internet purposes. [29] Also, as

Europeans travel to the United States with their stored value cards, they will expect it to be accepted by merchants.

6. The market for electronic money systems should be allowed to develop on its own without government interventions.

Although there are a number of legal issues, as noted as Chapter 6, that need to be addressed, the market for these systems should be allowed to develop on its own. However, regulators should continue to monitor the development of these systems and be prepared to make recommendations and, if deemed necessary, regulations. This may become extremely important if standards are to be developed on a global basis. A supranational body may be required to address the development of standards for the systems and the legal issues, especially if these products are used on a wide basis internationally.

The involvement of the U.S. government should be limited to broader policy issues, similar to the position taken on tariffs and taxes on Internet commerce.[30] Although the development of a legal basis for electronic commerce makes sense, the impetus for legislation that is needed should come from the industry as the market develops.

Future Research Efforts

So many questions remain unanswered. These questions fall into many different and diverse categories. Just a few examples can show the diversity of the questions that still need to be addressed. What incentives, if any, are necessary to get American consumers to accept these electronic money systems? Will government policy intervention be needed and on what scale? Can standards be developed so that the cards can be used internationally? How will disputes be handled? Will new laws be needed?

The questions can only be answered over time. With an emerging product, it is impossible to predict what concerns and issues will develop over the life of the product. Before the Internet developed, issuers of credit cards, a mature product, could not have anticipated that there would be a need for making payments over an open system. In the same manner, it is impossible to anticipate all the questions, issues, and needs that will have to be addressed as these electronic money systems travel through their life cycle and become a part of our everyday lives.

Notes

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9. Pae, Peter, "Smart Cards Get Off to a Slow Start: They're Fixtures in Europe, but Americans Still Prefer Cash, Credit", The Washington Post, 3/21/98, p. D1.

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11. "Cash -- Choice form of Payments", Business Week , April 8, 1996, p. 24.

12. This survey was conducted under the auspices of the Federal Reserve System. Questions were asked in the University of Michigan Survey of Consumers in May 1995 regarding the uses of currency and other payment methods. The University of Michigan Consumer Survey is conducted by the Survey Research Center, a unit of the Institute for Social Research at the University of Michigan, and is an ongoing monthly nationally representative survey based on telephone interviews of adults living in the coterminous United States (48 states plus the District of Columbia).

13. Ibid.

14. Congress of the United States, Congressional Budget Office,"Emerging Electronic Methods for Making Retail Payments", Washington, D.C., June 1996, p. ix.

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