

**E-money, New Developments in the Banking Industry and Their
Effects on Marketing and Forecasting Practices**

Dr. Cihat POLAT¹

Abstract

The paper discusses the transition processes in the banking industry with respect to the technological innovations and the technological developments, more specifically electronic money (e-money) and Internet Banking, and their effects on marketing and forecasting practices. Besides others, particularly these two innovations have many important effects on various aspects of life for both individuals and companies including from their spending patterns to payment behaviour (for individuals) and from organising their business functions (e.g. marketing) to managerial practices (for companies) (e.g. cash flow forecasting practices). The paper also briefly discusses the effects of these financial innovations on the payment system from various standpoints including the transition process from traditional money to e-money, the success of e-money, the change in the demand for traditional money, and the effects of e-money on the banking system. It points out the effects and implications of Internet banking and e-money on marketing and other operational activities such as short-term cash flow forecasting as a sales demand and cash management tool at the same time.

Keywords: E-money, Internet Banking, banking, marketing, sales forecasts, demand forecasting, demand for cash, cash flow forecasting, ATM, product

1. Introduction

The banking industry has experienced dramatic changes in the last 30 years due to the effect of developments in the telecommunications and information technology (IT). The rapid evolution of IT has opened new dimensions in the operations and marketing activities where the interconnectivity between communication mediums has made the transfer of large amounts of data possible. The birth of the Internet and electronic data transfer are considered to

¹ Niğde Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, İşletme Bölümü, Merkez
Kampüsü, 51100 Niğde E-mail: cpolat@nigde.edu.tr

be the most revolutionary stage of the evolutionary process of banking [Giannakoudi, 1999]. The Internet has simulated many new technological innovations in the banking industry as well as in many other areas of the economic and the social life.

The purpose of this paper is to discuss the effects of two of the most influential technical innovations, Internet banking and e-money on bank cash flows and cash flow forecasting, with respect to marketing and some other operational managerial activities, which corresponds to one of the most heaviest product / service that banks offer their customers. The outline of the paper is as follows: The second part reviews developments in the banking industry in the recent years, and, then discusses Internet banking. The third part discusses the electronic money (e-money) issues and points out the effects of these innovations on the bank payment and marketing system. The fourth part discusses the security issues related to Internet banking and e-money. The fifth part discusses the likely effects of those technological developments and innovations on the demand for cash by customers (as product) and the need for cash flow forecasting both for sales management from the marketing point of view and cash management from the operational management point of view. The last section contains the conclusion.

2. A New Way of Banking: Internet Banking

Banking is one of the industries that follow technological developments very closely and has introduced many innovative new technological products. After the introduction of credit cards in the early 1970s, the automated teller machine (ATM), which performs many of the functions of a human teller, was the next step. The developments in IT technology and electronic data transfer have led to the formation of ATM networks, which has been a major evolution in the industry [Giannakoudi, 1999]. All these developments in the industry have made electronic commerce more prevalent. Businesses have increasingly used electronic payment methods including electronic data interchange (EDI) and electronic funds transfer (EFT) to eliminate the costly transfer of physical contracts and payments for many years [Muhammad, 1997].

The banking industry turned its face to utilising PC in banking in the 1980s and 1990s. The developments in networking, the emergence of the Internet and the World Wide Web (www) and the use of applications with a highly developed graphical user interface (GUI) in the Internet environment created new opportunities for banks. Among the various innovations 'Internet Banking' has been, perhaps, the most important technological innovation in the banking industry in the 1990s. If we leave the problems and difficulties aside, many Internet banks that operate only in the virtual environment have been

established and gained thousands of customers just in a short period of time after they started business (e.g. NetB@nk). Security First Network Bank, www.sfnb.com, which grew to 10,000 accounts size in a two years period [Muhammad, 1997]. The importance of these figures are not due to how large customer base these banks gained compared to traditional banks but relates to how fast they increased their customer base in Internet environment. Today, besides the new Internet banks, most of the traditional banks have already extended their operations to the Internet environment and provide many of their services to their customers through Internet banking, in which they never touch or see cash in physical sense. These technical innovations have motivated people to think and visualise cashless [Bers, 1995] and checkless [Reed, 1998] societies, where cards and computers are expected to replace them.

In addition to the traditional banking services (e.g. checking bank accounts, transferring money, keeping track of transactions), Internet banking also offers new financial services and products including 'digital money' and 'electronic checks'. Internet Banking 's main advantage is that it offers services regardless of time and place limitation, which are beneficial, both for banks and customers. Contrary to traditional banking services, Internet Banking allows even small banks to expand their business and give them access to customer bases from around the world, which can be done without the major investment necessary for constructing physical branches and hiring a large number of people. It also creates opportunities for small banks to use the same distribution channels as the big banks use, where previously only big banks could maintain such a large distribution channels by opening many branches all over the country and could only the multinationals ones do it by opening branches in other countries. Internet banking also allows banks to offer 24 hours service opportunities irrespective of office hours and holidays. These advantages and low operating costs have enabled Internet banks to increase the competition and have motivated new innovations in the industry. Many of the recent technological innovations (e.g. smart cards and e-money) in the banking industry can be attributed to the high level of competition among the actors in the industry, both the established banks and the new electronic entrants.

Surveys show that the use of Internet banking is increasing very fast. "According to the information market research firm Dataquest, at the end of 1998, 7 percent of all households did some banking by PC. Dataquest's March 1999 survey of 16,000 consumers suggests that over 5 percent of U.S. adults view their account data on line, 3.75 percent transfer funds online, and 2 percent pay bills online (Bank Network News, 1999). According to a PSI Global survey, small companies' use of PC banking has risen over the last few years from about 1 percent in 1996; but still, in 1999, fewer than 10 percent of the

respondents reported using it. According to the survey, about 200,000 small business currently bank online." [Mester, 2000]. A survey carried out in UK, however, reported that less than 1 % of the UK public banked over the Internet [Marketing, 1999]. The same research reported that 24 % of the public would be prepared to do so. In terms of the number of customers, two different studies estimated that around 200,000 and 450,000 people in the UK were banking online and predicted it to be around 7 million by 2003 and 2.2 million by 2002, respectively. As of today, these figures should have probably doubled or more. The figures are important for pointing out how fast Internet banking is expanding. The next section discusses one of the most influential technical innovation that has been expected to have a substantial influence on the banking industry, e-money.

3. E-Money

The emergence of an electronic form of money, e-money, has been compared to the innovation of bank notes in the early eighteenth century and is considered by some to be the start of a new economic era. It has been claimed that in the next 10 years plastic cards are going to bury the traditional currency [Bers, 1995]. Of course we will have to wait to judge the truth of that statement but it can be seen that, even though not fully realized, this statement has come true, at least partially, especially in countries such as the United States and some European countries, where the volume of trade being done over the Internet and with other sort of electronic mediums are so huge.

The term 'e-money' is used to define a monetary value represented in the form of electronic signals. Theoretical discussions about e-money within the context of economics are outside the scope of this study. E-money has taken various forms including (1) electronic bank notes (e.g. chip cards such as Mondex, a smart-card that also allows person-to-person transfer), or eCash, computer tokens, (2) electronic checks, and (3) credit card type mediums [McAndrews, 1999]. E-money is stored either on plastic cards (e.g. smart cards), called stored value card systems, or on a computer drive, called digital cash systems. It uses traditional money to purchase a claim on a merchant or vendor first, and then this claim is traded for goods and services with merchants that accept it. In terms of transactions, the circulation of e-money takes place either in a closed-system or in an open system. In a closed system e-money is transferred only within the system such as telephone cards of a specific company or photocopy cards in a university. In an open system e-money is transferred freely among the parties that accept it and may even include the involvement of a bank [Mester, 2000]. Some open forms of electronic payment methods (ATM networks, credit

cards, and point-of-sale debit card networks, and Automated Clearing Houses² (ACH)) have already been in use in closed systems for many years. Open systems differ from closed systems in terms of possible risks due to the nature of the access restrictions such as in Internet banking, where there are no restrictions compared to the closed systems. This brings some additional security issues up to surface about Internet banking and e-money, which are discussed separately below. However it should be pointed out that the developments in the encryption and digital signature methods are also one of the main reasons behind the creation of such a payment medium. When taken as a whole, e-money is considered one of the most influential and intellectual innovations created that utilise technological, economics, and financial information and methods simultaneously in the banking industry in the recent years. The influential side of e-money can directly be attributed to the new type of economy created, in which the payment medium has its own form and, maybe flow patterns, and new type of relations among the parties that are involved in the system.

E-money has various advantages. It provides fast payment opportunities especially for small amounts. It removes the necessity for the payments be made face-to-face regardless of the amount of payment like the payments made with checks by post but removes the time needed to clear them, which the payment is made almost in real time, which increases the circulation speed of e-money. Thus, higher volumes of economic and financial activities can be observed in an economy, which is quite meaningful both from the marketing and forecasting perspective.

3.1. From Traditional Money to E-Money

E-money has been a symbol for the cashless society. The creation of a cashless society is not only a technological issue but it also depends on the willingness of several parties including banks, merchants, consumers, and governments to invest in the systems [Bers, 1995; Muhammad, 1997]. How long it will take to have a cashless society is a difficult question to answer. There are many factors, as pointed out below, that affect the time to transition; however, it would be easy to say that it is not going to be short. An executive officer of a US regional ATM networks stated in 1988 that "In 25 years, we have placed cards in the hands of only 60 percent of our customers, and 60 percent of them use the

² An electronic interbank payment system that is used for small and recurring payments including direct deposit of payrolls, automatic payment of utility, mortgage, and/or other bills.

cards". He means that over the past 25 years, less than half of the customers currently use ATM networks. "More than 20 years after the prediction of a 'checkless society', Americans are writing more checks than ever--approximately 12 per month per house--hold, according to one recent survey" [Lamb, 2000]. These remarks bring home how slowly we have moved towards a checkless or cashless society. It can be concluded that the concept of cashless society has not been widely accepted as a whole [Reed, 1988].

On the other hand, it is evident that the Internet is changing consumer payment behaviour in the choice of medium. For instance, while consumers use credit cards for only 25 % of their purchases of all kinds in their traditional shopping, purchasers on the Internet do more than 90% of their total buying with plastic cards, which are credit card-driven [Kuykendall, 1999]. However, those figures should be evaluated together with the percent of people who purchase on the Internet and the monetary value of those purchases within the total. It was estimated that about 40% of the American households had access to the Internet in 1999 [Orr, 1999]. In 2005, sixty-eight percent of American adults, or about 137 million people, used the internet, up from 63% one year ago [Pew Internet & American Life Project, 2005]. According to another study, 88.9% of all American households owned a personal computer, and 81.4% of all households had Internet access [Carrol et al., 2005]

Mester's [2000] study shows that cash is the dominant payment medium (53 %), which is followed by checks (22 %), credit cards (19 %), debit cards (5 %) and others (1 %), respectively, in the USA. According to another study, the payment methods by consumers follow the order of cash (94 % of consumers), checks (71 %), general purpose credit cards (57 %), debit cards (38 %), store cards (29 %), and smart cards (12 %) in the purchases of American consumers [Chain Store Age, 1999a]. The same study also expected an increase in the volume of debit cards but as a replacement for checks, not cash. In addition, 62 % of the retailers surveyed preferred cash against debit cards (15 %), store cards (10 %), credit cards (8 %), and checks and stored value cards (0 %) [Chain Store Age, 1999b]. The figures show that cash is still dominant even in the payment behaviour of American consumers. Most probably, it has as much, if not more, weight within the payment behaviour of people and payment systems in other countries.

In the long term it is expected that paper and coin will be dominated by e-money (no matter what form of e-money it would be) and that may change many things from global economy to customer behaviours and firms' salary payments. One of the main reasons behind this is that the electronic forms of payments are incomparably cheaper and more efficient than paper-based or

traditional payment methods. However, albeit the use of e-money may spread very quickly given that sufficient confidence develops with regard to its security, it is unlikely to happen in the near future. It is reported that currently 90 % of all consumer transactions in North America involve cash and coin [Boardman, 1999]. However, the popularity of electronic form of payments has continuously increased in recent years and with the addition of new electronic payment mediums the electronic payment methods have become an important part of the retail payment system [Mester, 2000].

3.2. The Success of E-Money in Practice

Many companies that are involved in e-money business have been established (e.g. CyberCash, Inc., DigiCash Inc., Qpass, Cybermoola Inc., Flooz.com Inc., ICanBuy.com Inc., and ECharge My Phone) some linking their operations to credit card companies (e.g. Mondex with MasterCard). Others have continued their business in different areas from those previously planned (e.g. CyberCash Inc.) or they try to open a space for themselves in the consumer markets (e.g. ECharge My Phone) [see, Kuykendall, 1999]. However, the picture emerging from the trials of e-money seems blurred. Trials of, for instance, smart cards in various places in the U.S. have not been very successful, where the users have found cash cards and credit cards more convenient. Some trials in Canada also did not give the expected results [see, Mester, 2000]. Beyond this, as some e-money companies such as DigiCash announced bankruptcy after a three years trial of its eCash in the U.S in 1998, others (e.g. First Virtual Holdings) have left the e-money business [Kuykendall, 1999]. But not all the companies are unsuccessful. Some e-money companies are trying to enter new markets in which to prosper by developing joint projects with companies from other sectors (e.g. utilities, telecommunications). Companies that build up joint ventures with existing banks or credit card companies are apparently more likely to be successful than others operating alone. Various ventures in e-money are still continuing in various forms. For instance, some credit card companies such as Visa and some banks such as First Union Bank, Nations Bank, and Wachovia Bank have developed their own smart card systems [Muhammad, 1997]. It can be expected that, if not immediately, e-money (in some form) should be successful through the backing of such large international companies.

3.3. The Change in Consumer Behaviour in the Demand for Traditional Money

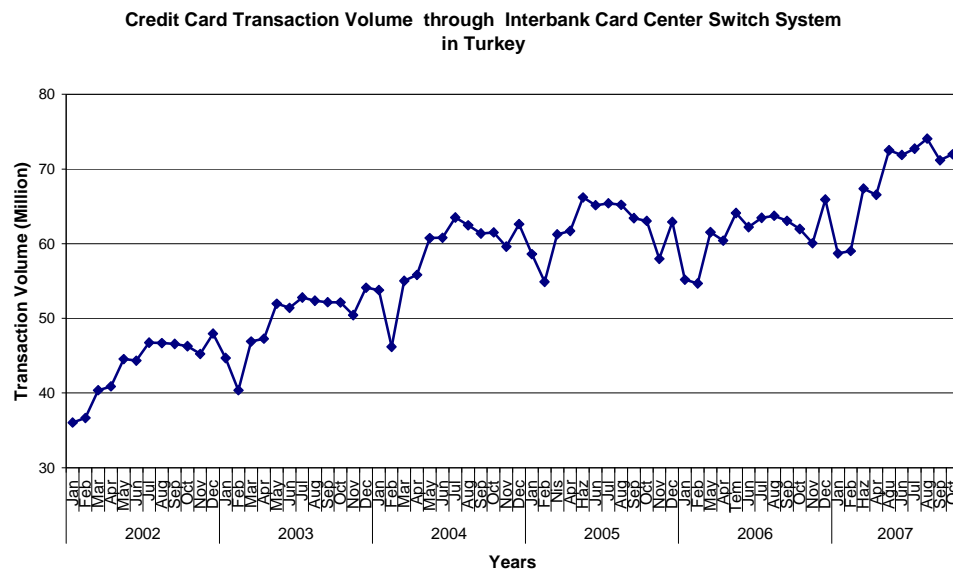
The issue of how consumer behaviour changes with respect to new payment methods is of considerable importance in the context of this research. This is mainly because consumer payment behaviour is the main force behind the

demand for the payment mediums including hard cash, which, in turn, has major effects on the ways of doing business in firms. Therefore, consumer payment behaviour and demand for cash (as a product from the banking point of view) are interrelated, which, in turn, also affect the cash flow and cash flow forecasting. However, as explained below, as money changes form, the demand patterns and demand forecasting applications also changes considerably, which is also needed to adapt to the new forms of money environments.

Social changes normally take quite a long time to complete and they occur gradually. Even though there are lots of technological developments and innovations in the banking industry, it takes time for customers and vendors to embrace these changes and to move from traditional payment methods to e-money or from traditional banking to Internet banking. According to a survey, consumers have a deep attachment to cash [Chain Store Age, 1999a]. The study found that: 1) among the users of each payment medium, cash users were the least likely to respond that they would change their payment method (only 8 %), and 2) cash users expected to pay with cash more often rather than less often, with a ratio of 3:1. Surely, consumers have their own reasons to use their own specific payment methods. The respondents indicated the reasons for payment preferences of cash as easy (21 %), no interest to pay (19 %), do not want bills later (18 %), convenient (9 %), and easier record keeping (4 %). The reader may refer to this study to see the reasons for payment preferences of other methods. These figures show that cash users need to be persuaded why they should use other payment methods, if companies want to succeed in new innovations. Referring to the same study once more, "Less than 10 % of non-users of any given payment vehicle are drawn to that method. With the exception of cash, which has a very low base, about 20 % of these non-users identify themselves as potential users, but around 70 % seem rigidly against the notion.", it can be concluded that changing consumer behaviour of payment method appears to be a challenging task, even though there has been a considerable change in the electronic payment mediums market in the recent years.

Payment behaviours of people in various countries show variations. For instance, while checks are important means of payment in the U.S., Canada, the U.K., and France, they are less important in other countries such as Germany, Switzerland, and Belgium [Mester, 2000]. They are even among the least important payment medium in Turkey, where banks provide service for checks (e.g. give check books) only for their privileged customers such as businessmen. Therefore, checks are not a common type of payment medium in Turkey. In developing countries, the alternative payment mediums are even less widely used in the payment system. Regardless of country, consumers have an emotional relationship with money, and saving and spending patterns are

difficult to change in a short period of time [Muhammad, 1997]; however, it is also unlikely to remain unchanged. In short, we can expect that cash and coin, still the main exchange medium, will remain be in circulation for a long period of time but we should also expect a noticeable change in the payment behaviour of people (see Figure 1).



(Data Source: Bankalararası Kart Merkezi – Interbank Card Center in Turkey)

Figure 1: The Change in the Volume of Credit Card Transactions in Turkey

The acceptance of e-money by vendors is dependent on some fixed costs (e.g. investment in new technological instruments such as computer systems and software, new security apparatus or infrastructure to protect the integrity of payment instructions in an e-money world). These, as can be expected, are considered as significant burdens on the designers and sponsors of these systems [McAndrews, 1999]. In such a case, because of the fixed costs, the average cost of the new instrument may exceed that of an older instrument. Such an economic calculation, at the very least, delays the implementation of the new innovations and extends the time interval over which the e-money systems are implemented widely. It is also dependent on how many intermediaries accept the product, which, in turn, depends on the number of customers that demand such a medium. Customers' and merchants' confidence in the medium's safety and soundness and the distribution of the risk, costs, and benefits of the new payment instruments among participants are also crucial factors in the adoption [Mester, 2000].

Security is important for both customers and suppliers. It has a major effect on consumer trust in use and acceptance of e-money and e-payment. The shopping behaviour of customers on the Internet gives a clear idea about how they think of it. A survey results indicated that security questions are of concern to many potential online bankers in the UK [Marketing, 1999]. The concern for security is no different in other countries in terms of concern. According to a survey of French consumers, although more than 1/4 of French households have PCs and about half of those are online, only 2 % have bought something over the Internet [Stores, 2000]. The article stated that consumers expressed concerns about credit card security and also lacked confidence with online sellers, desiring to see products before buying. Another survey of industrial purchasers found that 40 % of the 3,000 people surveyed buy online at least once a week; however, most of the online-buyers pay by check. We already know that businesses may want to use the float from the checks. However, while those who involved in Internet commerce reported convenience, 24-hour availability, and quick response time as major factors of online purchasing, those who are reluctant to make commercial transactions through Internet reported security concerns as a major determinant factor [Faraza, 1998]. In an additional survey of the public's opinion of card fraud in the USA, 90 % of the 502 respondents reported credit card fraud to be a problem. Only 10 % thought it to be an insignificant problem or gave no opinion [Credit Card Management, 1998]. Consumers also think that Internet transactions are one-third more risky than store-based transactions [Chain Store Age, 1999a]. In spite of all these statistics, according to a survey of the Internet users in 1998 in the USA, over 90 % of the users were making purchase online and about 60 % were also paying for the items over the Internet [Mester, 2000]. The surveys reveal that the issue of security still seems to be a deterrent factor that would affect the success of electronic payment methods. Unless enough confidence is built on the security of internet transactions, which may take long time, it is likely that all the expected success of e-money and/or e-payment methods are going to be affected seriously because of the sensitivity of the issue. This subject is discussed further below.

4. E-money in Turkey

In the pages above it has been stated that the banking industry is one that follows and applies technological developments and innovations very quickly. The industry being highly competitive does not allow banks much time whether they should adopt to those changes or they follow them after some time. A group of banks gathered under the chair of Central Bank of Turkish Republic in the name of E-money Work Group on 22 September 2000 in order to examine the changes in the field and make suggestions for the regulations to be done

regarding the legal and technical aspects of the issue. As in many other industries, especially in this particular industry technological innovations are quickly turned into 'products' and supplied with the customers. Severe competitive conditions in the market may create quite negative conditions and competitive disadvantages for the banks that are not of with a high adaptation capability to the new innovations and developments.

Generally speaking, most of the banks in Turkey do closely follow technological changes and attempt to get benefit of them. In many ways, Turkish banks are not behind their European or American counterparts in terms of applying technological changes and creating new technological 'products'. For instance, credit cards have found a new way of application in Turkish market, which can be called Turkish version, in which banks apply the style of selling in installments to credit cards, an important innovation in a relatively narrow Turkish market that created a considerable business potential for the credit card issuing banks, which could otherwise be impossible to reach.

Naturally, markets that companies operate may considerably differ from each other. The companies have to develop appropriate products for certain market conditions. For instance, US market has attracted many companies to develop products that could only be applicable to such market conditions with its existing market structure (with its level of development) and economic potential. Based on its specific structure, US market has triggered many new innovations such as e-money.

Turkish banking sector can not be said to be as innovative as its US counterparts even though it follows most of the new technological developments and apply them to its body. It is rather a close follower. It has also been the case for e-money. E-money, whatever form it has in Turkey today, is also shaped by the banking sector. As with the banking sectors in many other countries, credit cards have been the most common form of e-money in Turkish banking sector. As of today, many of the Turkish banks issued their own credit cards or have developed partnerships with big credit cards companies including Visa and MasterCard.

Another form of e-money, called 'parakart', has been applied in pilot university campuses such as Bosphorus University and Middle East Technical University, which was developed by Akbank. The product used the 'smart card' technology, is a multi-purpose product and can be re-credited. It was designed to make small payments. Credit loadings onto the card can be made from/to a banking account through a point-of-sale (POS) machine linked to the system of the bank.

There also exist electronic payment products developed by other institutions. Examples are phone cards issued by Turkish Telecom, Akbil (Akıllı Bilet), smart ticket, issued by Istanbul municipality, and natural gas cards, metro cards and bus cards issued by Ankara municipality.

Even though there has been considerable progress in the application and use of e-money, it is hardly possible to see the examples of eCash or Mondex types of it or any companies that are established solely for e-money business. It can be mentioned several reasons for this including the market potential for such a business, the level of technology to develop and maintain such a business and the country's legal system, which was little likely to support or allow such a mechanism to work.

In Turkey, e-money applications are seen in form of electronic payment methods rather than pure e-money mentioned in the previous paragraphs. Some of the examples are the Citibank's 'E-card', Finansbank's 'Finanswebpos', Garanti Bank's 'Sanal Kart' (Virtual Card), and Ottoman Bank's³ 'Webmondial Kart'.

E-card is an electronic payment medium issued for the Citibank's own customers with the slogan of '100 % Security for Shopping on the Internet'. In order to provide sufficient security with the customers when they use their e-cards, the bank provided a card number independent of a customer's credit card number with a limit equivalent to 20% of original credit card. However, the customer has an option to change the limit on the card, which has supported with many security measures including Visa and MasterCard logos and holograms on it and a magnetic field that includes the customer's details. FinansWebPos is a point of sale (POS) product that provide a secure on-line environment for internet companies' customers to use. Garanti Bank's Sanal Kart (Virtual Card) is considered to be 'virtual' in reality with a limit of '0' because, unlike the examples above, one can not have it physically. It can only be used on the internet for shopping. In order to be able to shop with this virtual card, the bank's customers need to transfer money to it; otherwise, it can not be used for shopping. After shopping, the customer who uses it can transfer the remaining balance on the virtual card back to his bank account. As there would be no or limited balance left on the card, this is expected to provide a sort of security for the card owner. The Ottoman Bank's Webmondial Card, based on

³ The Ottoman Bank has been merged with another bank.

the credit card principles, is a virtual MasterCard and designed to be used on the virtual transactions. It provides secure shopping and transactions made on the phone or internet to the card owner, which can also be used for paying for subscriptions and regular payments. However, it can not be used for POS machines, ATMs, imprinters or cash withdrawals. It has its own security mechanisms such as card number and security pin code.

Especially with the transition to new bill system in Turkey, called New Turkish Lira (YTL), in January 1st, 2005, use of e-money can be expected to grow faster. In order to increase the market share in the card market, some of the banks already intensely advertised on media and presented their cards to consumers as a solution for the likely confusions due to the simultaneous use of old and new bills, which are going to be in the circulation and used together for a period of one year, with the slogans emphasizing that customers can use their bank cards for payments instead of using cash and getting confused and also the convenience of using these cards. The transition period from the old bill system to the new one, the process can be psychologically bothering for many ordinary people to use and work out with both bills simultaneously. This may increase the people's tendency to make their payments with their bankcards, which in turn promote the extensive use of them naturally.

Generally speaking, the use of e-money is triggered by the developments in the e-trade. Therefore, these two subjects should be taken into hand together. By the end of 2004 the volume of Business to Consumer (B2C) e-trade is forecast to be 614,3 *million* \$, the number of internet users 10 million, and annual online payment per person 61,4 \$ in Turkey. On the other hand the volume of Business to Business (B2B) e-trade is forecast to be 3235 *million* \$ in Turkey (against 1500 *billion* \$ in USA), where the number of internet users are estimated to be around 11 million (10 million PC) for the end of 2004. (http://www.yapikredi.com.tr/tr/isletme/eticaret_default.shtml) (See, Figure 2). However, the number of internet users also increases in Turkey, too, as it does in the world.

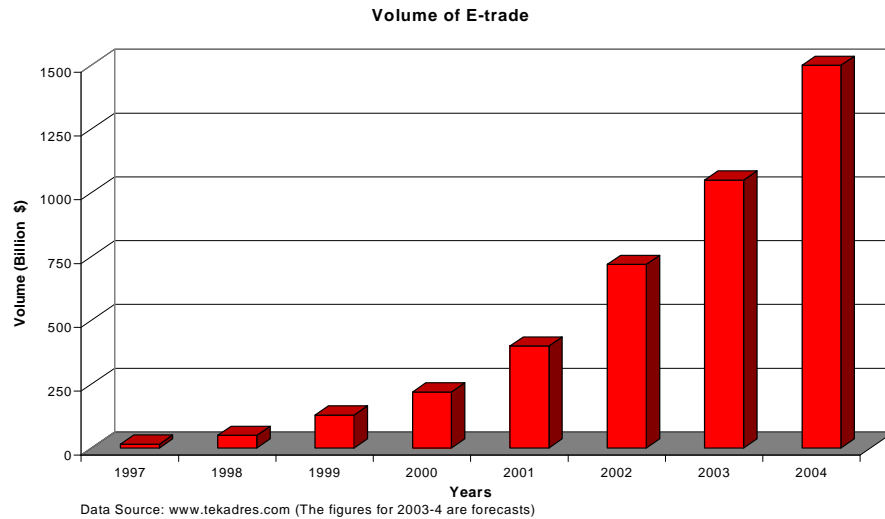


Figure 2: Volume of E-trade in the USA

5. The Effects of E-money on Banking

It is evident that the participation of new actors (e.g. non-financial institutions) in the financial area through the Internet has had a great effect on the financial industry. Whether these new entrants will pose a threat to the banks and their positions depends on the acceptance and the success of the new instruments (e.g. smart cards and e-money) and views on this vary. Unless the amount of these new instruments adds up to a large sum in the total payments (of a country) in the near future, these new entrants (or non-banks) are unlikely to pose any threat to the position of the traditional banks [Mester, 2000]. According to another view, the banks' monopoly position in the financial sector and their 'intermediary' role in the payment system has been seriously affected by the entry of non-bank institutions and this can be expected to have a corresponding effect on the role of the central banks, which are the heart of the traditional banking and payment system [Giannakoudi, 1999].

The effects of e-money on the banks' role mainly depend on the issuer. In the first case, where e-money is authorised by a financial institution, it is intermediated by traditional settlement and clearing systems. In such a case it would be a transformation from one form of bank liability to another. The circulation of e-money would originate and end in established banking sector in the real world, where the Internet would simply be used as an intermediary or a delivery channel for the transfer of funds. In the second case e-money is issued by a non-financial institution. It involves real cash and is spent in the form of digital tokens in the virtual world and is outside the banking system. In this case

the central bank's ability to control the e-money supply would lessen [Giannokoudi, 1999] and it may naturally affect all the banks in the system with respect to the flow of funds and the demand for e-money. The effects of e-money on the banking system are widely discussed by Giannakoudi [1999] and Mester [2000].

However, the e-money business is being formed within or around the banking industry and has a very close relationship with that industry. For instance, the smart cards by First Union are reloadable at ATMs [Muhammad, 1997]. In a similar example, a mobile phone operating company, a joint venture with Türkiye İş Bankası, has developed the opportunity for its customers to recredit their phone cards at ATMs of that bank [Hurriyet Gazetesi]. It was the National Westminster Bank in the U.K. that first started Mondex. Its U.S. rights have been purchased by a group of leading banks and MasterCard, which later purchased a large interest in the world-wide rights to Mondex. In future a joint venture of banks and technology firms, like the credit card and ATM industries, may come together and establish a clearinghouse for the clearing and the settlement of payments. They may also establish an organisation for determining business policy, strategy, and network rules [McAndrews, 1999].

In conclusion, the non-bank institutions that operate in the e-money business are not expected to pose a risk to the main roles of the banks in the payment system, at least, in the near future because the new instruments (e.g. smart-cards and other forms of e-money) are mainly designed for small payments and are not expected to involve large sums or represent a large part of the total payments [Mester, 2000]. However, as the intermediation role in electronic payments is performed mainly by the technology giants such as IBM, Microsoft and Netscape, it can be expected there to be a high competition among them for this role. Therefore, those companies are likely to be one of the major players in the new type of economy and are likely to determine and shape the future, use and form of e-money deeply as intermediators. Nonetheless, the main part of the e-money business seems to be forming around the banking industry with the banks as major players.

5.1. The Uncertainties in Security and Legal Issues

Internet banking appears to be very attractive both for the banks and their customers but there are still many issues that need to be solved. As the uncertainties and risks can be classified into three groups (e.g. operational, credibility, and legal risks and uncertainties) (TTB Report, 1998), some of these risks and uncertainties look more serious, are more concerned about, and discussed more intensively than the others. One of the most sensitive and

important issues is the security related to the internet banking and e-money infrastructure (system), where money transfers are still posed to serious risks for both banks and customers. Many technical methods including digital signatures, encryption, and internal control systems are already widely in use in data transfer and protection; however, there are still many questions to be answered concerning the technical and legal aspects of these issues. The threats to the security of the system and the losses derived from many sources (e.g. technical malfunctions, customer misuse, external attacks to the system and financial fraud in open networks) are not completely eliminated yet [Giannakoude, 1999] but it is not clear enough yet who bears the risk of loss under various circumstances. There are still many legal problems regarding which party (or parties) is/are responsible for the losses incurred [see Giannakoude; McAndrews; and Tomasula, 1997 for further discussion about security issues]. It is also evident that the existing legal regulation is insufficient to regulate Internet banking and other technical innovations yet (e.g. smart cards and the legal status of their issuers and customers) and the establishments of new regulation, usually follows far behind the technological developments. [see Giannokoudi [1999] and Mester [2000] for further discussions of legal issues]. Besides digital signature provides some sort of ease and security for the transactions being performed on the electronic environments, it is difficult to judge to what extent it offers solution to the problems including security. It is yet to be seen the practice of digital signatures and the likely problems associated with it, some of which comes from the later adaptation of technological developments to practice by many countries than the others (e.g. in e-money and digital signature). In this regard Turkey has already had an important step forward by issuing the law about digital signature (Article No: 5070); however, a premature regulation has its own potential risks such as slowing down the developments and technological changes and creativity in the field. In terms of organisations that issue e-money, legal problems surround its status. Traditional money is issued under the authority of states and is backed by governments, a standing which e-money lacks. The issue of fake e-money looks a more serious problem than thought and electronic environment may provide a suitable environment for such type of crimes. Given that a bank or an institution issued e-money, naturally they are expected to be the party that should undertake the liability that comes from this fake money against the (bank) customers. However, there is no such a sufficiently legal infrastructure yet even in the most developed countries. The shortfalls in the security issue may seriously affect the credibility of a bank. Also, the rapid changes especially in the software technology makes the banking system open to outside attackers if the bank can not adapt itself to those changes and follow them behind, which has its own cost and creates extra security problems. A further issue relates to how to account for the stored value of cards for the financial institutions. Discussions

are going on whether it should be regarded as a debt of the banks to their cardholders [Giannakoudi, 1999; Mester, 2000].

6. Automated Teller Machines (ATM) and Their Functions

It has been pointed out in the early pages that the introduction of ATMs was a turning point in the traditional banking. ATMs have introduced a new concept and a new way of banking, which spread out the service location and removed the limitations in the service time prior to Internet banking. It has also already changed the bank and customer relations to a certain extent through the customer adopting new ways of banking. However, the main focus in this part is the effect of ATMs on the demand for traditional cash flow in banks.

There were 100,000 ATMs in the USA as of 1995 and it was projected to increase the number of ATMs to 200,000 by the year 2000 [Giannakoudi, 1999]. The wide-spread distribution of ATMs increased the expectation of bank customers to find an ATM even in a very small retail store where transaction volume is low. After Internet banking was introduced, one could normally expect that the increase in the number of ATMs would slow. However, this has proved to be not the case in reality. On one side the expectations of customers and on the other side the multi-functionality of ATMs in meeting the customer demands for service and, in return, their contribution to reducing the service costs of banks to customers made banks keep investing in and installing new ATMs. Figure 3 illustrates the increase in the number of ATMs in operation of Bank X in recent years.

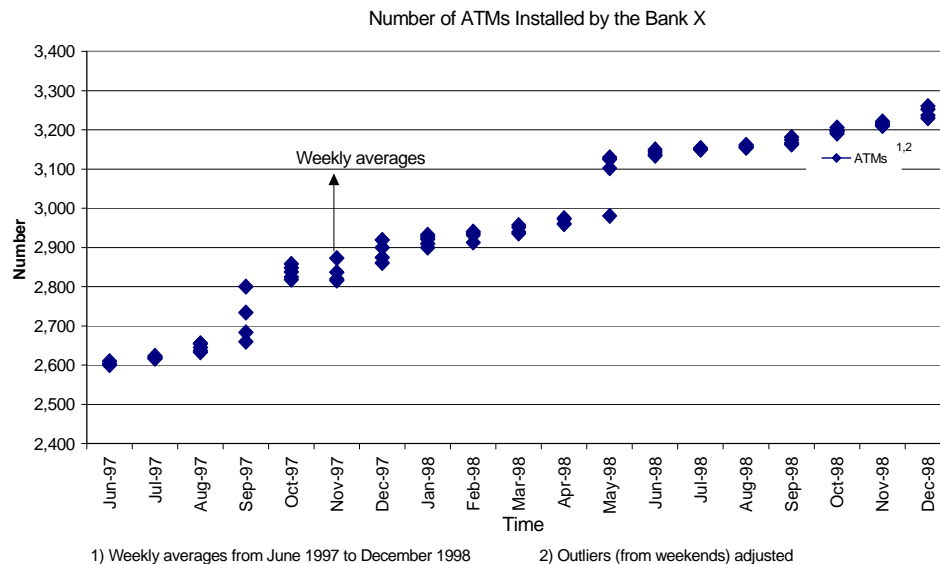


Figure 3: Number of ATMs in Operation Through Time in Bank X

Of course, cash dispensing is only one of the functions of an ATM and many new technological innovations (e.g. loading e-money on the smart cards from the existing ATMs, as already pointed out in the previous pages) are targeted to be compatible with the existing infrastructure, both to avoid the new costs and to utilise the existing facilities so as to obtain the maximum advantage from it.

Another aspect of ATMs is their ability to offer service without the locational limitations of branches almost everywhere in the world. Today, it is not overstated if we say that the current network infrastructure between banks and the network covers almost all the world. For instance, LINK is the shared network of cash machines and self-service terminals in the UK. It provides several building societies and banks with a UK-wide, shared network of ATMs. The interconnected networks such as LINK allows each bank to use the other banks' facilities and provide service to their own customers. Through international ATM network connections, the customers of many banks have access to more than 300,000 ATM's worldwide. LINK provides a connection to the Europay/Mastercard and VISA international network. Membership of any of these families (e.g. Europay/Mastercard family includes Europay debit and credit card products and Eurocard, MasterCard, Eurocheque, Maestro, Cirrus brands; VISA family includes VISA debit and credit cards and PLUS brand)

gives institutions the opportunity to issue the family's debit and credit card products and to acquire transactions on their branded cards at their ATMs.

The LINK network with connections to over 50 institutions offers access to approximately 55,234 UK ATMs as of 24 February 2005, which was around 33,000 in 2002. LINK undertakes settlement on more than 200 million ATM transactions each month, which was again around 120 million transactions in 2002, and over 6,7 million transactions per day, which was about 4 million in 2002, for its over 101.5 million LINK-enabled cards in circulation, which was 80 million in 2002 [see Figure 4]. LINK is the biggest ATM switch in the world, and will this year switch over 2.5 billion shared ATM transactions on behalf of its 51 Members (<http://www.link.co.uk/>).

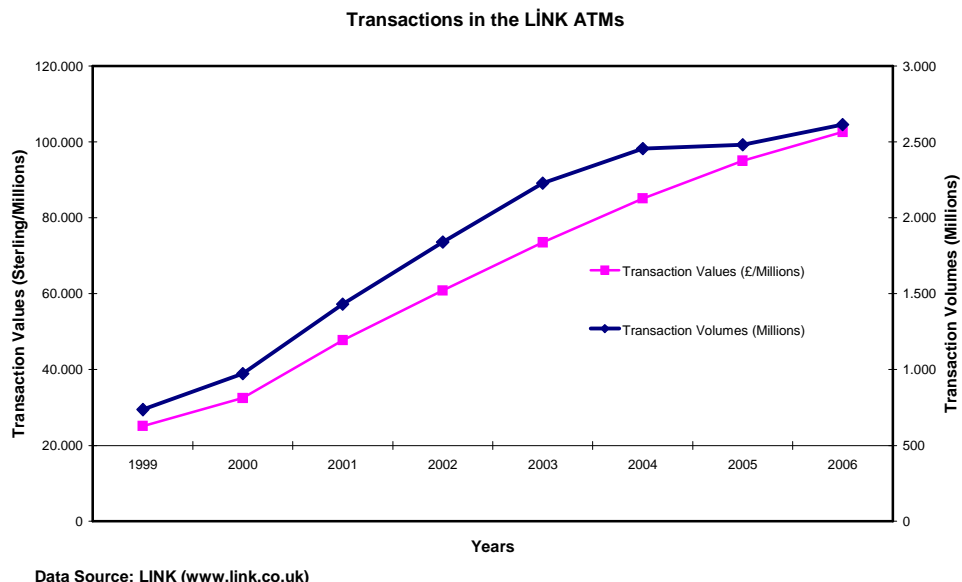


Figure 4: Number and Monetary Volume of ATM Transactions in LINK network

The graph illustrates a steep increase both in the number and monetary value of transactions done through ATMs in the LINK network. It gives a good picture and idea of the level of demand for cash in UK. It is likely that one of the reasons for this sharp increase in the total cash volume is the involvement of the new members in the LINK system.

mobileATM™ is a joint venture between LINK Interchange Network Ltd. and Morse, a FTSE 250 consultancy and IT equipment reseller.

With the support of mobile network operators and the UK's major financial institutions, mobileATM™ offers consumers the opportunity to use their mobile phone as a medium for carrying out financial transactions and accessing information about their bank or building society accounts.

mobileATM™ will be launched during Q1 2005, initially providing consumers with the ability to execute Balance Enquiries and use a Mobile Phone Top-Up (MPTU) facility, which will allow the addition of credit to any operator prepay account via the user's bank account. The future roadmap includes a wide range of services, based upon consumer demands and agreed in conjunction with the card issuers and the mobile network operators involved in the delivery of the mobileATM™ service.

The next service to be delivered will be Mini-Statements, and this will be closely followed by "push services" (transaction notifications, overdraft notifications, mortgage applications commentary etc.) and online banking services (lost/stolen card notification and cheque book ordering, PIN, and overdraft requests).

Another service to worth mention that the LINK (ready to) offer(s) is *mobileATM™*. It is the mobile handset-based mechanism that provides consumers with secure access to, and control over, their financial accounts. While ATMs' security is controlled using a combination of something personal that the account holder possesses - (a card) and something that the account holder knows (their Personal Identification Number, or PIN). *mobileATM™* uses the same model for gaining access to and controlling financial accounts. Security is assured through the use of banking grade encryption technology on the handset. The handset acts as the personal item in the possession of the account holder and in order to access *mobileATM™* services, the consumer is always required to enter a self selected passcode. In order to use banking services from their mobile phone, consumers need to download the *mobileATM™* application to their phone, using either (www.link.co.uk) address (from Q1 2005) or from their handset.

Initially, *mobileATM™* are planned to provide balance enquiries and prepay airtime top up services from mobile handsets, with a whole range of additional services to follow. The LINK reports that *mobileATM™* has been developed in response to consumer demand (www.link.co.uk). *mobileATM™* means that, more than ever before, consumers will be able to have convenient, real-time control of banking services. The LINK claims that, based on a research, more than 70% of mobile users consider their mobile phone as a potential payment instrument.

The graph shows that, despite the fact that the electronic form of money, Internet banking and mobileATM™ types of banking may have some effect on the demand for cash, demand for cash still remains high. The increase in the number of ATMs and, thus, easy access of customers to the facilities is probably one of the biggest factors that support the customer demand for cash.

According to a study, the use of debit cards at the point-of-sale both to make purchase and receive cash back is likely to have the greatest impact on the use of ATM in the short-term [America's Community Banker, 1997]. However, the wide-spread facilities of providing cash-back probably supports the use of cash among consumers. The same study claims that ATMs and point-of-sale payment methods will remain the dominant electronic payment methods for the next 10 years for consumers but the new technologies and other digital cash products may replace the current role of ATMs and debit cards in the long term.

7. The Effects of Internet Banking and E-Money on Short-term Cash Flow Forecasting

Established banks in the industry have not remained passive in the face of the revolution caused by the Internet in the financial sector. They have taken leading roles by taking advantage of their privileged position. Most of the banks have already extended their operation to the Internet and opened their Internet banking services. While some banks have opened new Internet banks with a different name such as Bank One in the U.S., which established the web bank 'Wingspanbank.com', many others have just extended their services to the internet under their own name (e.g. National Westminster Bank, Barclays, Nationwide, Lloyds, Royal Bank of Scotland, and Co-operative Bank in the U.K [Marketing, 1999] and Garanti Bankası and İş Bankası in Turkey besides many others). The existing banks apparently have a more advantageous brand compared to the new entrants to the industry because they already have an established customer base. One consequence is the future of Internet banking can be expected to shape around the traditional banks.

From the commentaries up to this point we can conclude that the traditional money and traditional payment methods are not expected to disappear in a short period of time. There are too many influential factors that slow down the transition process to a cashless or e-money society, even if that may prove the final outcome. However, the main issue that these changes raise for this research is whether the function of cash flow (demand) forecasting changes. The answer to that question may provide enough clues for the future practice of demand forecasting of cash within the context of banking industry. To answer that question comprehensively, several issues need to be highlighted.

First, e-money seems to have some potential problems in the global payment system. Even though the developed countries have advanced through e-money, the level of developments in terms of legal regulation, technological innovations, payment systems infrastructure, consumer behaviours and acceptance, etc., the uptake of e-money differs greatly even among those developed countries. In the global level the sensitive e-money payment system seems to be subject to some risks and problems because of the legal and technical inconsistencies among countries. It can be said that the traditional money is going to be in the scene for a long period of time.

Second, technological developments are not followed simultaneously by all countries in the world. The adoption of the innovations described into the banking systems in different countries are also not simultaneous. It has been pointed out that the transition to and adoption of those new technologies take a long time even in the most high-tech society in the world. The traditional payments mediums can be expected to persist longer in the payment system in the developing or less developed countries. The rationale for demand forecasting of (traditional) cash flows will therefore remain for a considerable length of time.

Third, as we pointed out above, the developments in the e-money occur within or around the banking industry. It can be expected that, even though the weight of the role of banks may not be as heavy as it is now in the traditional money and payment system, the banks are still going to play a major role even in e-money system. As long as the intermediary role of banks continues, the need for the demand forecasting for cash flow can be expected to persist regardless of the type of hard cash or e-cash economy

Also, the demand forecasting of cash flow in banks focuses on the flow of funds from/into the bank and its branches. The need for forecasting the demand arises because of the differences in the cash inflow and cash outflow amounts and the occurrences of these flows in different time points.

Fourth, the electronic payment (e.g. electronic checks and e-money) and transfer methods (e.g. EFT and EDI) has enabled fast funds transfer mechanisms. It is very difficult for companies to benefit from the float⁴ any

⁴ It can simply be defined as the difference between the balance of a firm's account (or checkbook) shown and the balance on the bank's records, which is mainly caused by

longer as much as they used to before. The cash managers have to maintain their cash positions to enable them to cover their cash outflows in a timely manner, where time become an even more critical factor. In other words, effective and efficient cash flow management is required in a fast funds flow environment, and therefore the importance of the demand forecasting increases dramatically.

A final point, the comparatively faster flow of e-money funds is likely to affect the existing forecasting procedures in several ways, at least, in the future:

- 1) With electronic money, the volume of demand for cash (flows) is likely to increase. The huge flow of data especially in large institutions (e.g. especially in the finance sector) is likely to force managers to develop and/or use forecasting procedures that can handle this large and continues flow of e-money data.
- 2) With the faster flow of e-money data, time can be expected to become a more critical factor and large scale forecasting problems need to be handled in shorter period of time. The forecasters are expected to develop/utilise forecasting procedures that can handle this type of forecasting problems. Automatic forecasting procedures, which are discussed in Polat [2002, Chapter 11] seem to be the only viable solution for this type of forecasting tasks.
- 3) When volume is large and timing is critical, forecasting procedures that not only automate the forecasting task but also that automate data pre-processing task may be required. Many new applications that can directly interact with the Internet are already in use and these can further be developed and combined with automatic forecasting procedures.
- 4) As already argued, there is developing a transition from traditional banking to Internet banking and traditional money to e-money. An important question is whether this transition would affect the forecasting applications in banks, say, within the next few years. Even though we do not expect dramatic changes in the very short-term due to the reasons explained so far, current trends suggest major changes in the whole banking industry in the medium term. The availability of manageable and easily accessible electronic form of cash flow data remains crucially important for forecasting purposes. Especially with the increase in the number of online bankers, the nature and structure of data flow in banks is likely to change. Their existing IT infrastructures may not be sufficient for efficiently managing cash flows where the number of online bank customers and

the time needed to clear (or cash) checks after they are written (or received) [Brigham and Gapenski, 1993, pg. 825]

electronic forms of transactions are heavily dominant. To avoid the likely problems, to have efficient cash management, and to have control over their cash flows and (cash flow information), banks may need to update their IT infrastructures (e.g. database structures).

- 5) The effect of the involvement of non-bank institutions into the payment system, if they become successful and have a major weight within the payment system, is uncertain; however, this is likely to have some sort of effect on the forecasting practices of both banks and other companies. Unlike current demand forecasting for cash flow in banks, where there is only a single type of demand volume of cash flow data, with the electronic form of cash flow forecasting banks and non-bank institutions may face various forms of demand volume of data (e.g. government issued and non-banks issued or data generated by traditional bank customers and online bank customers), This may have different characteristics and may require different managerial procedures, making the forecasting task more complicated.

8. Conclusion

This paper has discussed some particular technological innovations created in recent years that have deeply affected the banking industry and demand forecasting of cash flow in particular, e-money, Internet banking, and some other technological developments. Although the innovations in the payment system brought about by the Internet are considered to be considerably important, they are still far from dominating the current payment methods and their digital equivalents. The studies have shown that there is a slow transition to the use of electronic form of money but at the moment this transition is not so large as to affect the whole payment system, even in the most developed countries. However, it is difficult to ignore the effect of e-money with variety of forms on the demand for traditional money (or cash). As with many new technological innovations, e-money and Internet banking are also not free from problems. There exist many legal, security, and behavioural concerns about new forms of money and banking, which are likely to significantly affect the transition to the new payment system where the payment medium is fully digital.

Banks strongly encourage consumers to adapt to the new form of money mainly because of cost concerns of the traditional money, where e-money is cheaper, easier, and a more profitable product for the banks. It also creates new forms of market for them, by which they issue many new products including credit cards, bank cards, and mobile banking applications (e.g. mobile GSM phones), each of which means a new market and a new profitable operational area for banks. In the meantime, the sector has attained considerable success in changing

consumer behaviour in the market. Today, many customers having at least a few bank cards or credit cards and the ever increasing volume of credit card transactions are the clearest indicators of the changing consumer behavior in the market.

In the new payment system, both banks and other firms are expected to have new methods of and approaches to demand management of cash as a product. The increase in the volume of funds and the speed of flow of e-money is likely to lead managers to find/develop new forecasting procedures that are capable of handling large scale and repetitive forecasting tasks where time is likely to be one of the most critical factors. Any new methods should be expected to be sensitive to the time constraints of managers and also be capable of producing the timely information (forecasts) required.

8. References

- America's Community Banker (1997), September, pg. 8.
- Bagstrom, H. and P. Stenkula (1997), Electronic Money - Risks, Questions, Potential, Quarterly Review, pp. 47-56
- Banyard, P. (1999), Cashless Society Boosts Crime, Credit Management, January, pp. 33-35
- Bers, J. S. (1995), In memory of money, Bank Systems & Technology (32), 9, pp. 42-46
- Boardman, M. (1999), The Future of Money, HR Magazine, April, pg. 216.
- Brigham, E. F. and L. C. Gapenski (1993), Intermediate Financial Management, 4th Edition, The Dryden Press, USA.
- Carow, K. A. and M. E. Staten (1999), Debit, credit, or cash: Survey evidence on gasoline purchases, Journal of Economics and Business (51), 5, pp. 409-421
- Carrol, Aaron E., Frederick P. Rivara, Beth Ebel, Frederick J. Zimmerman, and Dimitri A. Christakis (2005), Household computer and Internet access: The digital divide in a pediatric clinic population, AMEIA Annual Symposium Proceedings (111-115), AMEIA Annual Symposium Proceedings Archive, <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1560660> (Accessed: 14 December 2007)
- Chain Store Age (1999a), Survey of Retail Payment Systems: Consumer Payment Options Grow, December, pp. 4A-13A
- Chain Store Age (1999b), Survey of Retail Payment Systems: Retailers Say Use of Credit On The Rise, December, pp. 14A-22A.
- Credit Card Management (1998), How John Q. public views card fraud, (11), 4, July, pp. 10-11.
- Elektronik Para Çalışma Grubu Toplantı Notu, 22 Eylül 2000
- Faraza, V. (1998), Secure Transactions?, Industrial Distribution, December, pp. 48-50

- Giannakoudi, S. (1999), Internet Banking: The Digital Voyage of Banking and Money in Cyberspace, *Information & Communications Technology, Law* (8), 3.
- Hawkins, G. (2001), Meeting the global challenge, *The Banker* (151), 903, pp. 96-97
Hurriyet Gazetesi, 17 April 2001
- Kuykendall, L. (1999), The Online challengers, *Credit Card Management* (12), 8, pp. 78-81.
- Lamb, E. C. (2000), Electronic billing: The Missing Link, *Community Banker* (9), 11, pp. 16-20.
- Marketing (1999), One in four to use Internet banking says NOP survey, *Marketing*, Mar 25, 1999, pp. 6 and 17.
- McAndrews, J. J. (1999), E-money and Payment System Risks, *Contemporary Economic Policy* (17), 3, pp. 348-357.
- Mester, Loretta J. (2000), The changing nature of the payments system: Should New Players Mean New Rules?, *Business Review - Federal Reserve Bank of Philadelphia*, Philadelphia, Mar/Apr 2000, pg. 3-27.
- Muhammed, T. K. (1997), Electronic Commerce and The Future of Money, *Black Enterprise*, June, pp. 255-259
- Orr, Bill (1999), At Last Internet Banking Takes Off, *ABA Banking Journal*, July, pg. 36
- Pew Internet & American Life Project, 2005, Two-thirds of American adults go online and one-third do not, *Pres Releases*, http://www.pewinternet.org/PPF/r/112/press_release.asp (Accessed: 14 December 2007)
- Reed, T. P. (1998), A Case for Shared Branching: The Personal Touch Remains, *Credit World*, Sept/Oct, pp. 10-11.
- Stewart-Allen, A. L. (1999), On the continent, U.K., Cyberbanking a reality, *Marketing News* (33), 20, pp. 14-15
- Stores (2000), France's Consumers Begin to Move into the Wired World, (82), 1, January, pp. 123-128
- TBB Report (1998), Elektronik Bankacılık ve Elektronik Para Faaliyetleri İçin Risk Yönetimi Raporu, Bireysel Bankacılık Denetim ve Gözetim Komitesi, Türkiye Bankalar Birliği, Mart 1998 (www.tbb.org.tr/turkce/basle/Electronic.doc)
- Tomasula, D. (1997), Tighter Security Loosens The Constraints On Electronic Commerce, *Wall Street & Technology* (15), 2, pp. 34-38.