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Abstract

During the 1990s the availability of location-specific retail payment services in Finland declined substantially, but at the same time there was a surge of development of self-service methods. These new methods, which make use eg of mobile phones and the Internet, dramatically increased the availability of payment services that are not tied to location. More traditional forms of payment still exist; for example, the use of cash remains significant. In Europe there are marked differences between countries with respect to the use of different payment methods. Generally, the use of cashless payment instruments has increased during the last ten years, but it seems that payment patterns are still not converging to similar structures.

The development of the Finnish retail payment system has long roots, and several factors – eg the salary bank arrangement of the 1960s and the severe banking crisis of the early 1990s – have influenced the development of the current Finnish payment system. In the retail payments area, new technologies are developing rapidly. The success of new forms of payment (based eg on mobile phones) in gaining general acceptance may depend on changes in the nature of consumption. If customer demand increasingly shifts toward virtual goods and services, the demand for new types of payment methods such as electronic money may increase substantially.

Key words: retail payments, electronification, ATMs, Internet banking

Vähittäismaksuliikkeen kehitys Suomessa 1990-luvulla

Suomen Pankin keskustelualoitteita 19/2000

Jussi Snellman
Rahoitusmarkkinaosasto

Tiivistelmä

Suomessa paikkaan sidottujen vähittäismaksupalveluiden eli pienten maksujen palveluiden saatavuus heikkeni selvästi 1990-luvulla pankkien konttoriverkoston sekä automaattiverkoston harventuessa. Samalla kuitenkin käytettiin enemmän sellaisia itsepalveluun perustuvia maksutapoja, jotka hyödyntävät uutta teknologiaa, kuten Internetiä ja matkapuhelimia. Huolimatta teknologian kehityksestä perinteiset maksutavat eivät ole kokonaan kadonneet, esim. käteistä käytetään edelleen paljon. Yleistrendi 1990-luvulla oli että muiden kuin käteismaksujen osuus kasvoi. Maiden välillä on kuitenkin edelleenkin huomattavia eroja. Useimmissa maissa tilisiirtojen osuus ei-käteismaksujen kokonaismäärästä on hallitseva, mutta muutamissa maissa sekkiä käyttö on edelleen varsin yleistä.

Suomaisen pienten maksujen maksujärjestelmän kehitys on ollut pitkä prosessi, johon ovat vaikuttaneet esim. palkkapankki-käytäntöön siirtyminen 1960-luvulla ja 1990-luvun alun vaikea pankkikriisi. Vähittäismaksujärjestelmien alalla teknologian kehitys on edelleen nopeaa. Uudet maksutavat voivat aiheuttaa suuriakin muutoksia nykyisten maksutapojen käytössä, mutta uusien tapojen menestys voi riippua suuresti kulutusrakenteen muutoksista. Mikäli kulutuksen rakenne muuttuu voimakkaasti virtuaalisia hyödykkeitä ja palveluita suosivaksi, kasvaneen uusien maksutapojen (kuten elektronisen rahan) kysyntä ja käyttö runsaasti.

Asiasanat: vähittäismaksuliike, elektronisoituminen, maksuautomaatit, Internetmaksupalvelut

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1 Introduction

The category of payment systems most familiar to ordinary citizens is that of retail payment systems, as virtually all members of society make and receive payments regularly. This paper charts the changes that occurred in Finland in the 1990s in the use and availability of retail payment methods. The purpose is to discuss briefly the characteristics of different payment methods and their accessibility to consumers and to evaluate the use of each method. The method is descriptive.

Overall, in respect of the use of different retail payment methods, the 1990s constituted a decade of major change in Finland. A prevailing trend has been the electronification of retail payment methods. Traditional methods, based on personal over-the-counter service and paper-based information transmission, have been replaced by new methods based on the principles of self-service and electronic forms of transferring data. Interbank payments have been predominantly electronic in Finland since the 1980s. In certain payment methods, notably credit transfers, the scope of means for initiating payments has also widened considerably. In a nutshell the development can be described as a gradual replacement of location-specific services by seamless, increasingly mobile services.

There are many factors that might help to explain the substantial change in the use of different retail payment methods in Finland during the last ten years.

The structure of the paper is as follows. Section 2 presents the different methods of payment available to consumers and discusses their current use and development over the last ten years. Section 3 deals with the accessibility of different methods of payment for consumers, taking into account the availability of location-specific payment methods and payment methods accessible via different, non-location-specific channels. Section 4 makes some comparisons for Europe. Section 5 is divided into two parts. The first part briefly discusses some factors that may have affected developments in Finland. The second part analyses possible effects of future technological development and changes in consumption patterns on the use of retail payment methods. Section 6 concludes the paper.

2 Changes in payment methods in the 1990s

2.1 Overview of current use of different payment methods

Despite the major changes in the use of different payment methods during the 1990s, the main characteristics of Finnish customer payments stayed essentially the same in throughout the decade. Retail payments in Finland were already in early 1990's dominated by credit transfers and card payments, and the role of cheques was very small. At the end of decade this situation still prevails. In the beginning of a new century customer payments in Finland are increasingly dominated by credit transfers and debit card payments. In 1999 the number of credit transfers per capita exceeded 90, i.e. was the highest in Europe, and the number of card payments per capita was over 60, which was second highest in Europe. However, there have been many changes as well. Direct debiting has grown constantly over the decade but still remains at a fairly low level. Cheques have completely disappeared from retail use. The most characteristic feature of the Finnish retail payment system has been the very rapid and extensive electronification of payments, which has created arguably the most electronified retail payment system in the world. However, despite the rapid electronification process and new technology the role of cash is still rather strong. Especially in small value retail payments cash is still widely used, and has not been replaced by new innovations, such as electronic money.

The rest this section describes the evolution in use of each retail payment method in turn. Each subsection first describes the method in question and the patterns of its use in the 1990s and concludes with a brief discussion of possible factors behind the observed developments.

2.2 Credit transfers

Credit transfers enable a bank customer to use an account to make payments. Funds are transferred in the banks' credit transfer systems, either within a single system (intra-bank transfer) or between systems (inter-bank transfer). Execution of a credit transfer requires separate initiation by the customer. Thus payments are initiated by payers. Currently there are several different channels through which these instructions can be sent. At the moment only funds on bank accounts can be used in credit transfers, although there are no explicit legal obstacles to development of credit transfer capability for savings funds.

Technological progress has widened the range of methods for initialising credit transfers. Phone-based home banking services emerged in Finland in 1982. PC-banking based on home PCs and modems has been available since 1984, giro ATMs since 1989 and Internet-based services since 1996. Recent technological developments in payment services include mobile phone-based banking applications, some of which also enable initialisation of credit transfers. These services (based on SMS¹ messages) have already been implemented in several countries,

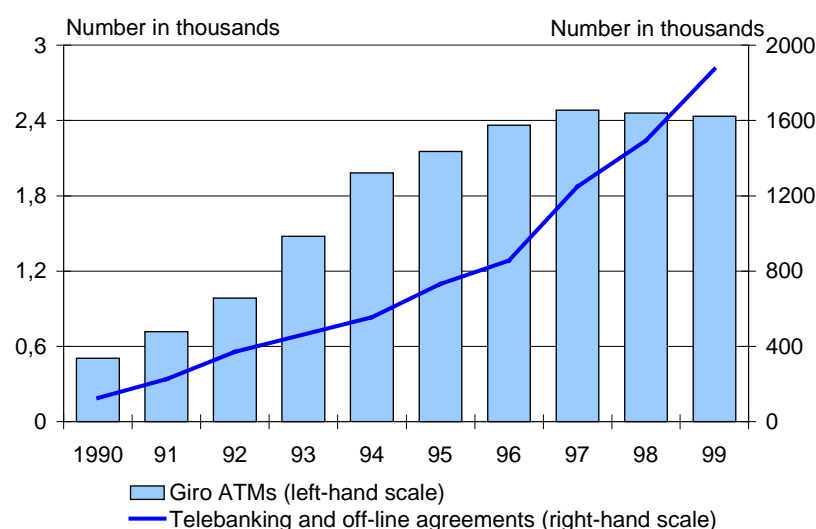
¹ Short Message Standard. Used in mobile phones in the transmission of text messages.

eg in Sweden, Norway and Finland (already in 1996). We are now seeing the emergence of the next generation of mobile phone banking services, based on WAP³ phones. Although these services have not yet made a real breakthrough, anticipated technical development and reductions in terminal (eg WAP phone) prices will likely boost their popularity in the near future. These issues are discussed further in section 5.2.

Because the more traditional credit transfer methods are still available, a credit transfer can be initiated by many ways: over-the-counter at a bank branch, using payment envelopes, using giro ATMs and bank-provided payment terminals, or via phone-banking, Internet or mobile phone-based banking applications. On the whole, electrification of payments has gone far in Finland. Currently about 85% of banks' customer payments are transferred electronically. The figure for private customers remains lower.

Giro ATMs have been in use since 1989. The number of giro ATMs rose rapidly from 500 in 1990, peaking in 1997 at almost 2500. After this peak the number of giro ATMs has declined slightly as banks guide their customers to the use new, substitute services. These substitute services include Internet-banking agreements with customers and new Internet-based payment terminals installed in place of payment ATMs.

Figure 1. Giro ATMs and data transfer connections between banks and customers



Source: Finnish Bankers' Association

Internet banking has been widely adopted in Finland, and per capita use of Internet banking services is probably the highest in the world. At the moment, all Finnish banks have Internet-based web banks, which inter alia enable execution of credit transfers via Internet. In mid-1999 the three banks with the largest absolute numbers of Internet customers in Europe were Finnish, namely MeritaNordbanken, OKO bank and Leonia bank.⁴ The number of Internet customers in Finland is still growing rapidly. At the end of February 2000, Merita-Nordbanken

³ Wireless Application Protocol

⁴ Pankkikatsaus 4/99, p. 9.

reported having 1.2 million Internet customers, OKO Bank 460,000 and Leonia. (at end-1999) 325,000. (In the case of MeritaNordbanken the figures also include Swedish customers, thus the total for Finland is lower). As all three banks mentioned are relatively small by European standards, it can be argued that the Finnish banks are leaders in utilisation of Internet payment services in Europe. It is however noteworthy that these figures are for numbers of agreements, not numbers of active customers. To obtain a clearer picture of the actual use of Internet banking services, one should look at the number of log-ins to banks' Internet services. In February 2000, Merita-Nordbanken registered 3.2 million, OKO Bank 1.6 million and Leonia 1.5 million log-ins per month⁶.

Direct debit is one way of arranging a credit transfer. In direct debiting a customer makes an agreement with the biller – usually via a bank – on automatic debiting of the customer's account in payment of bills on the appropriate due dates. After a direct debiting agreement is in effect, the customer need not separately execute a credit transfer, ie there is no need to contact the bank. The payment is thus initiated by the payee. An increasing number of different service providers are offering the possibility of handling regular bills via direct debiting.

Despite the fact that one can handle a substantial part of his/her regular bills through direct debiting, the use of this medium in Finland has remained modest compared to many other European countries. The popularity of direct debiting has increased in Finland in the last few years, but still in 1999 only 7 direct debit transactions were made per capita. It is not easy to explain the small numbers of direct debits in Finland. One factor might be the abundance of different credit transfer technologies, which enable eg payment of bills conveniently from the office via Internet. Thus there is no need to visit bank branches in order to pay bills. It may also be the case that, due to the relative convenience of credit transfer technologies, the public has preferred to retain the right to decide on when to pay bills and have thus been reluctant to enter into direct debiting agreements, which remove that right.

A recent development in Internet banking and Internet payments has been electronic bill presentment (EBP), in which the delivery of the bill is also done via Internet. When a customer makes an EBP agreement with a service provider, bills are no longer sent in paper form by post, but are sent directly and electronically to the customer's bank, ie to the customer's Internet banking website. For bill payment, the Finnish banks offer two options: direct debiting, in which the bill is debited from customer's bank account on a due date, or so-called direct payment, in which the customer has to log-in to his/her Internet banking website and accept the bill before it is debited.

Banks also try to utilise their Internet banking facilities by offering services to Internet-based merchants. This enables the customer to use his/her bank account to pay for Internet purchases. When paying for purchased products/services in the merchant's e-shop, the customer selects his/her bank's sign at the merchant's website. After this, the bill for merchandise is sent directly to the customer's Internet banking website. The customer logs on to his/her bank, and pays the bill. The bank's system notifies the merchant of the payment immediately. Currently this service requires both customer and merchant to have accounts in the same banking group, interbank payments are not yet possible. However, due to the heavily concentrated banking sector in Finland, having agreements with the three major banking groups enables a merchant to cover over 80% of his customers.

⁶ MTV/STT 7.3.2000.

2.3 Payment cards

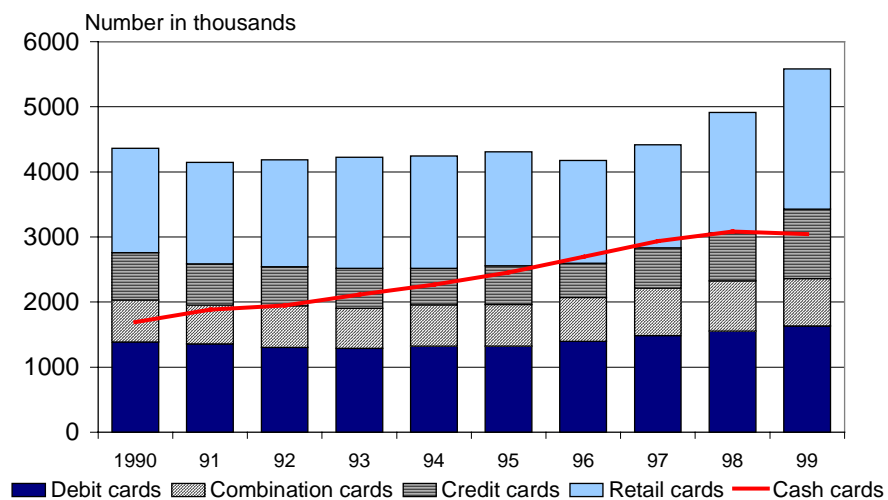
Payment cards can be divided into debit, credit and prepaid cards as well as combination cards. Bank cards are distributed by banks. A payment with such a card is debited from the attached bank account. Only certain customers are entitled to obtain bank cards. This is due to the danger of overdrawing, which arises because some payment terminals lack the capability of online checking of account balances and manual checks are mandatory only for transactions exceeding FIM 1000 in value. A bank will normally grant a bank card to a customer who has a Finnish social security number, a permanent residence in Finland and a faultless credit history. Debit cards are usually used for non-recurring electronic transfers at the point of sale (EFTPOS) to initiate payment to the vendor. The cardholder's account is immediately debited.

Credit cards are issued by credit card and financing companies (often via banks), which have their own rules governing the issuance of cards to customers. Credit cards can be divided into general purpose credit cards and retail cards. General purpose credit cards can be used (at least in principle) to buy all kinds of goods and services, whereas retail credit cards (eg cards issued by petrol station chains) are valid only in specified retail outlets and are accepted by specific firms. Credit cards with interest free credit period (eg Visa and Mastercard) are also called charge cards. Credit cards are used in both online and offline systems to initiate and authorize payments.

Pre-paid cards are associated with electronic money (see section 2.6. for details). A combination card incorporates both debit and credit facilities (and sometimes an e-money purse) in a single card.

In addition to payment cards, banks issue ATM (cash) cards, which can be used only for withdrawing cash from ATMs and for initiating credit transfers (using eg giro ATMs or Internet terminals). ATM cards are not accepted by EFT-POS payment terminal systems, which means they cannot be used for making payments in shops etc.

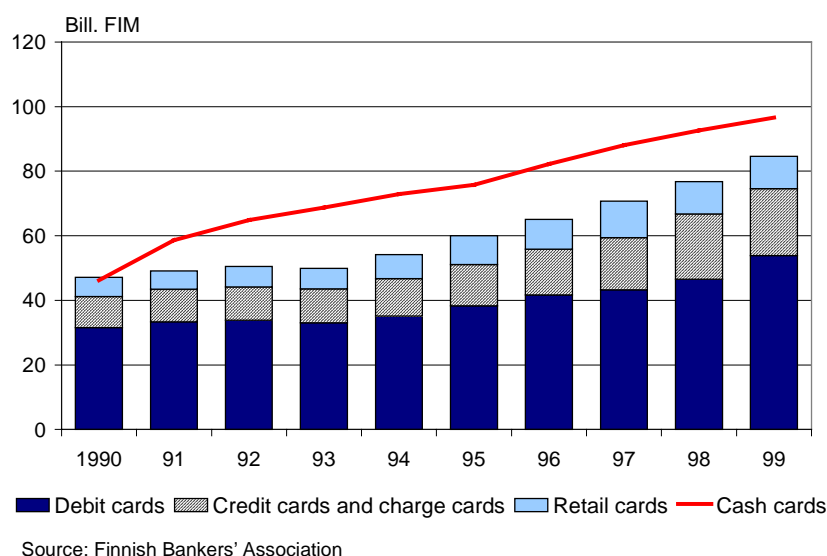
Figure 2. Number of payment cards outstanding



Source: Finnish Bankers' Association

The number of payment cards outstanding increased slightly during the 1990s, from 4.4 million in 1990 to 5.6 million in 1999, of which general purpose payment cards (bank cards, general credit cards, combined cards) increased from 2.8 million to 3.4 million cards. In the same period the number of ATM cards almost doubled, from 1.7 million to 3.0 million. The combined number of these cards thus increased from about 6.1 million in 1990 to 8.6 million in 1999. During the same period the total value of payment card transactions increased from FIM 47.2 billion (bank cards FIM 31.5 billion, general credit cards FIM 9.7 billion, retail cards FIM 5.9 billion) to FIM 84.6 billion (FIM 53.8, FIM 20.8, FIM 10.0 billion).⁷ Average annual usage of a bank card has risen from 66 times in 1990 to 82 in 1998, and usage of a credit card from 24 to 38. The total number of payment card transactions was about 60 per capita in 1998.

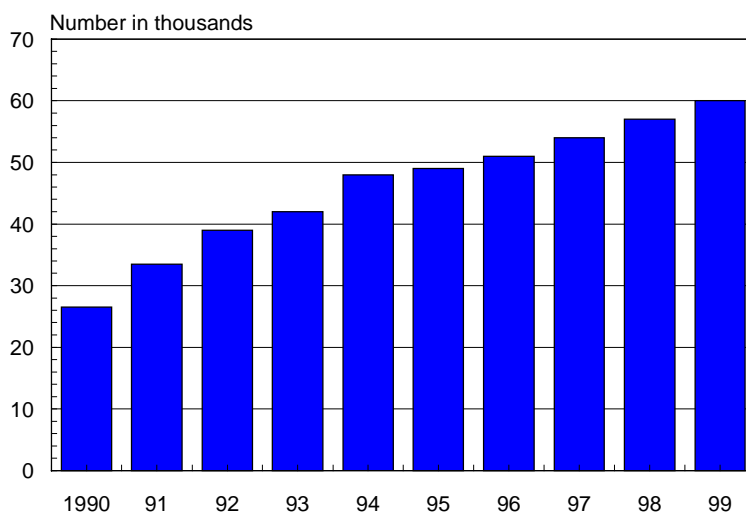
Figure 3. Total value of payment card transactions



Another critical factor in the use of payment cards is the number of EFT-POS (electronic funds transfer at point of sale) terminals. The number of EFT-POS terminals has increased (at a slowing rate) throughout the 1990s, from 26,500 in 1990 to 57,000 in 1998. The early 1990s was the period of peak growth, whereas growth in the latter half of the decade growth was markedly slower.

⁷ Finnish Bankers Association, 1993 ja 1999c.

Figure 4. Number of EFT-POS terminals



Source: Finnish Bankers' Association

Bank cards have become more useful, even for low-value payments, since the banks abandoned the nationwide FIM 30 payment minimum. Now the minimum is determined by each bank, and at least some service providers accept smaller bank card payments. (The card is debited by FIM 30 and the customer is given the change in cash).

The number of different kinds of payment cards per adult Finn was 1.4 (0.9 for general purpose payment cards) in 1999. Thus there is a substantial number of people who do not possess a payment card and are unable to pay by card instead of cash. Online payment cards may change the situation. An online payment card is attached to the payee's account, and functions essentially like a contemporary bank card. The difference is that a terminal that accepts online payment cards must have the online account balance check feature, which obviates the danger of overdrawing. Presently, balance checks are mandatory only for payments exceeding FIM 1000, and overdrawing is still possible for lower-value payments. Online payment cards may be an option for customers who are either not eligible or not willing to use bank cards.⁸

2.4 Cash

Cash payments are usually associated with face-to-face transactions of low value between individuals or between individuals and a retail firm. A cash payment is an immediate and final transfer of value, and the currency thus received can be immediately reused by the recipient in other transactions.⁹ Cash is thus based on open circulation, i.e. it is reusable without passing through a central bank.

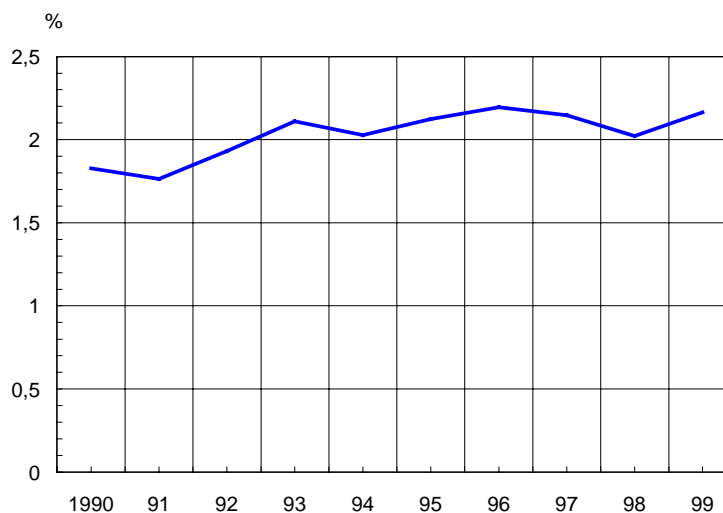
The amount of cash in circulation is recorded regularly, but because of the open circulation we do not have statistics on the actual use of cash. Thus one must rely on estimations and surveys for measuring the use of cash. In Finland the

⁸ Helsingin Sanomat 12.7.1999.

⁹ BIS 1999, p. 3.

amount of cash outstanding has been very low relative to GDP, the amount of cash outside credit institutions (excluding cash in ATMs) amounting to about 2.2% of GDP in 1999. The corresponding figure for the EU area has generally been about 5-6%.

Figure 5. Cash outside credit institutions, % of GDP¹



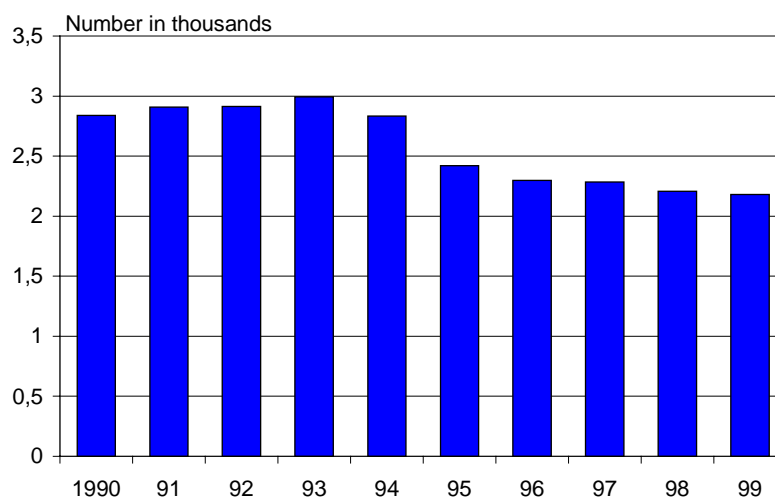
1) Excluding cash in cash dispensers

Source: Bank of Finland

Cash withdrawals have been possible, over-the-counter in bank branches or from ATMs. Now a third option has emerged, as several retail chains have made agreements with banks that allow customers to withdraw cash from retail cash desks. Such withdrawals must always be authorised. The maximum amounts that can be withdrawn under these agreements are bank-specific, up to FIM 2000.

The most common method of withdrawing cash is through ATMs, which accounts for about 80% of cash withdrawals in value terms¹⁰. In 1999 the total amount of ATM withdrawals was FIM 89 billion. The cash ATM network peaked in size in the early 1990s and has since declined substantially. The number of cash ATMs rose from 2800 in 1990 to 3000 in 1993, after which it declined to 2200 in 1998 as banks reduced the overlapping of ATM networks and the numbers of bank branches. Downsizing of the ATM network will continue in the future. Automatia (owner and operator of the biggest ATM network) has planned to renew only 1500 of 1900 currently operating ATMs. Automatia has justified the decision on cost grounds. Monthly operational costs of an average ATM are FIM 10,000, and economic minimum usage is estimated at 10,000 withdrawals per month. (In 1998 the monthly average number of withdrawals was 8700 per ATM). However, one should also question the effect of reduced competition in ATMs, as before jointly founding Automatia, the three banks operated separate ATM networks. Despite the still quite extensive ATM network and the fact that over 90% of Finns currently hold a card with cash withdrawal facility, over-the-counter cash withdrawals still are fairly common.

¹⁰ Finnish Bankers Association 1999a, p. 14.

Figure 6.**Number of cash dispensing ATMs**

Source: Finnish Bankers' Association

The use of cash in Finland is nowadays confined largely to retail payments. Although data on the use of cash are scarce, it can be stated that the share of cash payments in the total number of payments is still considerable. Of the total (monetary) value of payments, the share of cash is much lower, as the average cash payment is relatively small. According to the Bank of Finland's 1992 survey of households' use of different payment methods, the share of cash payments in the total value of households' payments was 40%; whereas, for the number of payments, the ratio was 80%.¹¹ Thus cash dominates other methods in small-value payments. According to the same survey, there are significant age-related differences in the use of cash. Especially elderly (over age 61) persons were found to favour cash over other payment methods. Also according to more recent research, the use of cash has remained at a substantial level, and there has been no major downward shift in the use of cash.¹²

In Finland the ratio of cash to GDP declined steadily from 15% in the early 1950s until the start of the 1990s. During the last few years this trend has been reversed, and relative cash holdings have increased slightly. There are several possible explanations for this development. The decline in interest rates has reduced the opportunity cost of holding cash (ie lost interest earnings) and may thus have lead to larger cash holdings. Also, the cash substitution process (measured by the rate at which other instruments replace cash in payments) may have slowed down. Thirdly, especially in the early 1990s, the severe depression may also have had a significant impact. During the depression many consumers ran into financial difficulties, which resulted in payment defaults, deterioration of credit ratings, and losses of bank cards and credit cards. Loss of cards then forced customers to resort to cash to an increasing extent. And finally, the increasing use of cash may suggest that the role of so called grey economy (unreported economic activity e.g. to in order to evade taxes) has grown. Grey economy favours cash transactions due to open circulation nature of cash which enables unrecorded transactions (i.e. transactions which are hard for authorities to trace) as opposed to e.g. credit transfers which are recorded in the bank's databases and customers' bank accounts.

¹¹ Viren 1993, 56–60.

¹² Snellman-Vesala 1999, Snellman – Vesala – Humphrey 2000.

2.5 Electronic money

Electronic money can be broadly defined as 'an electronic store of monetary value on a technical device that may be widely used for making payments to undertakings other than the issuer without necessarily involving bank accounts in the transaction, but acting as a prepaid bearer instrument'.¹³ Electronic money systems have been developed as substitutes for conventional cash. Most European countries, including Finland, currently have at least one e-money scheme. E-money systems can be divided into general purpose and restricted applicability systems, as well as into open circulation and closed circulation systems. E-money is considered to be general purpose when it can be used to make purchases from service providers other than the issuer (or its affiliate). According to above definition, limited applicability schemes, ie schemes in which e-money can be used to make purchases only from the issuer (or its affiliate), should not be considered e-money schemes. An open circulation system enables the transfer of e-money by the end user without involving the issuer (as with conventional cash, notes can be transferred from wallet to wallet). In a closed circulation system, money circulates via the issuer, ie a merchant cannot use e-money received directly to make payments but must first credit the issuer who later credits the merchant.

In Finland e-money has been available since 1993. The only general purpose e-money scheme currently in use, Automatia's Avant II, has been in operation since 1997. In addition to Avant, there are a few small, restricted systems, eg Matkahuolto's scheme for paying bus fares and so-called citycard schemes available in several cities and towns (eg Rovaniemi, Seinäjoki, Vaasa), which are mainly used for paying certain communal fees. Currently most e-money schemes around the world, including Avant, are based on closed circulation. The largest open circulation e-money scheme is Mondex, which is not available in Finland. Finland also had an Internet-based e-money scheme, but it was closed in 1998 because of the low level of usage.

Avant e-money is available via disposable cards or reloadable chipcards issued by banks (e-money functionality built into a bank/credit card). Loading is possible via ATMs (eg OTTO ATMs) or via Internet using a PC software application and card reader. E-money is accepted as a payment medium by about 600 different service providers, using a total of 5300 payment terminals. The use of e-money is still relatively limited. At end-1999 the number of outstanding e-money cards (both reloadable and disposable) was about 450,000, and in 1999 a total of 510,000 payment transactions were made using e-money cards.¹⁴

2.6 Cheques

A cheque instructs the payer's financial institution to debit the payer's account for a specified amount and to transfer that amount to the payee's financial institution for credit to the payee's account or to pay the amount in cash. Cheques may be used for payments of any amount, whether remote or face-to-face or for single or recurring obligations. Acceptance of a cheque in a face-to-face transaction usually

¹³ ECB 1998.

¹⁴ Source: Automatia.

depends on valid identification and evidence of payer's creditworthiness, such as a credit card.¹⁵ As received cheques can, in principle, be reused for making purchases, they can be considered an open circulation instrument. However, in practice they are seldom reused.

In Finland the use of cheques for retail payments has been steadily declining, to a negligible level. This development is probably due the development of more effective methods of payment, pricing of cheques and discontinuance of bank guarantees. In retail business, debit and credit cards supplanted cheques already in the 1980s. The annual volume of cheques written dropped from 15 million in 1990 to 1.4 million in 1999. The average size of a cheque has increased substantially, being over FIM 480,000 in 1999. Thus cheques are used in large-value payments, and the total value of cheques still is relatively high despite diminishing usage.

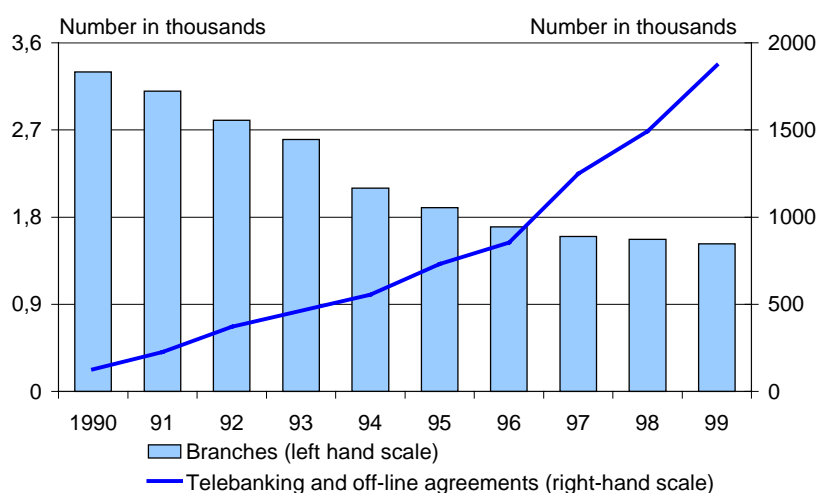
¹⁵ BIS 1999, p. 3.

3 Availability of different payment methods

3.1 Development of banks' branch networks and other location-specific services

Scaling down of banks' branch networks has reduced the availability of services tied to a fixed location, ie face-to-face services. The total number of bank branches in Finland has diminished substantially, from 3300 in 1990 to about 1500 at end-1998. During the same period the number of bank employees has roughly halved, from 50,000 to 25,000. During the last few years the pace of branch network reduction has slowed. Total employment in the banking sector is still diminishing, but at a slower pace than in the early 1990s

Figure 7. Number of bank branches and data connections between banks and customers



Source: Finnish Bankers' Association

Due to the sharp downsizing of branch networks, there are now fewer locations for making over-the-counter cash withdrawals and credit transfer orders. This reduction in the availability of location-specific services has been enhanced diminishing giro ATM network (which was discussed in section 2.2) and by increased fees for manual personal services.

The availability of location-specific services has unambiguously diminished during the 1990's. However, the overall availability of services from fixed locations is also affected by cooperative arrangements between banks and other service providers. Many Finnish banks have been active in creating alliances with e.g. insurance companies and different retail chains. In the future, outsourcing of services and cooperation between banks and other service providers may lead to increased availability via other service providers (eg retail stores) of services that have so far been provided only from banks. Already now it is possible to withdraw cash from some retail store cashiers, and services based on travelling bank representatives are being provided on a trial basis. At least one of the Finnish banks has piloted a scheme of travelling bank representatives in several regions of the country.

3.2 Bank – customer data connections and information technology

Besides the scaling down of branch networks, the Finnish banking sector in the 1990s experienced a major increase in alternative channels through which banking services are made available to customers. New methods, based on data interchange, have made their breakthrough in recent years, as can be observed from figure 8. As noted in section 2.1, these technological advances have had an especially strong influence on alternative ways of initiating credit transfers.

In the development and adoption of new banking technology Finland has been one of the leading countries in the world. It can even be claimed that to a large extent our country has been a laboratory for new distant banking inventions during the last few years. The state of infrastructure for distant banking is good in Finland. In terms of both the number of Internet connections per capita and mobile phone penetration, Finland is among the world leaders. In July 2000 the number of Internet hosts per 1000 people in Finland was about 135, which was the highest in Europe.¹⁶ By comparison, in Sweden the corresponding figure was 70 and in Germany 23. According to Statistics Finland, already in autumn 1998 some 1.3 million Finns, ie 42% of the population between 15 and 74 years of age, had the possibility of using Internet either at work, home or place of study.¹⁷ Since then, the use of Internet has expanded further. According to a survey by Gallup Finland in December 1999, 51% of Finns between 15 and 79 years of age had used Internet during the last three months and 41% used it at least once a week.¹⁸ Also, 43% of households currently own a home PC, and almost 70% a mobile phone. This infrastructure provides a solid foundation for use of Internet- and mobile phone –based banking services.

The continuous technological progress has facilitated especially the initiation of credit transfers. Banking services based on SMS messages have been available for a couple of years. More advanced and user friendly services are already possible using WAP technology. WAP enables construction of Internet-based services for mobile phones, and already during this year it will be possible to provide virtually all banking services via mobile phones. Examples of services using WAP technology include mobile stock broking, offered by several banks and brokerages. New technology, especially third generation (3G) mobile phones, which will enter the consumer market within the next two or three years, will enable further payment service applications.

Safety of wireless data transfer is improving due to new technology, eg digital signatures. Digital signatures based on PKI technology (Public Key Infrastructure) enable identification of parties exchanging information and, using encryption, securing transmitted data and hence preserving confidentiality. PKI is already used in HST card (electronic identity card launched in Finland in December 1999) and several on-stream or soon-to-be commercial applications. The third generation of mobile phones will further enhance service provision possibilities as it will enable eg transmission of moving pictures. The trend in the future is to ever-tighter integration of computers and mobile phones, eventually leading to portable terminals incorporating the functionalities of both of these (now) more or less separate devices.

¹⁶ The number of Internet hosts in USA is difficult to determine precisely. This is due to fact that instead of country-specific codes (e.g. .fi, .se, .de) USA has used organisation –specific codes (e.g. .com, .org, .net). During the last few years many foreign companies have also reserved e.g. .com –host names, thus making it difficult to determine the share of US –based companies.

¹⁷ Finnish Bankers Association 1999b, p. 8.

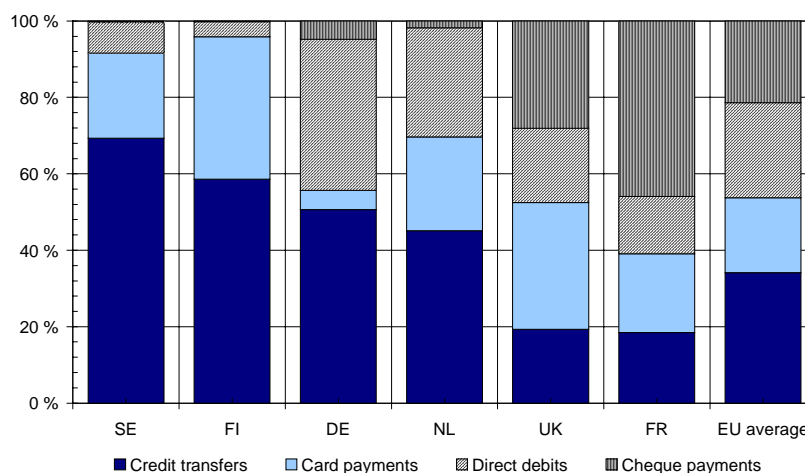
¹⁸ Gallup NetTrack, www.gallupweb.com/inetstat.

4 Some European comparisons

The use of different retail payment methods in Finland is significantly different from that in most other European countries. Also more generally, retail payment patterns vary substantially between different countries in Europe. This section makes some comparisons between Finland and several other European countries and tries to pinpoint some of the most significant differences. The Finnish situation is compared to France, Germany, Netherlands, Sweden and United Kingdom. The reference countries have been chosen to reflect the diversity of the payment patterns in contemporary Europe. Moreover, in order to describe the changes that occurred during the 1990s, two years (1990 and 1998) are used as bases for comparisons. The latter year is the latest for which statistics were available at the time of writing. The figures are based on the ECB's Blue Book – Payment and Settlement systems in European Union.

When analysing the use of retail payments all countries can be roughly divided into two groups: giro countries (relying mostly on credit transfers and direct debits), and cheque countries in which cheques still play a major role as a retail payment instrument. For the group of countries used in this paper, this diversity in the use of cashless payment instruments can be clearly seen in figure 9.

Figure 8. Breakdown of cashless payment transactions in 1998



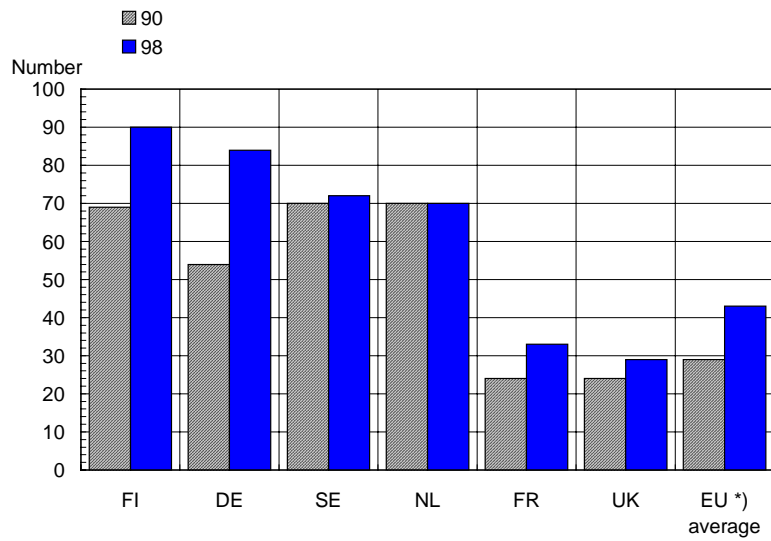
Source: ECB and Finnish Bankers' Association

Sweden, Finland, Germany and Netherlands can be categorised as giro countries, whereas in France and UK the role of cheques is still strong. When looking at figure 9 it should be noted, however, that it charts the relative use of different payment methods and not absolute numbers.

The use of credit transfers has increased in virtually all the countries, as can be seen from figure 10. Despite the common trend of increasing volumes, there remain significant differences in the use of credit transfers. The giro countries – Finland, Sweden, Germany and Netherlands, naturally have the high per capita use of credit transfers, but also in cheque countries the use of credit transfers has increased. Notable is the very fast rise in the credit transfer usage in Finland and Germany during the 1990's.

Figure 9.

Number of credit transfers per inhabitant in 1990 and 1998



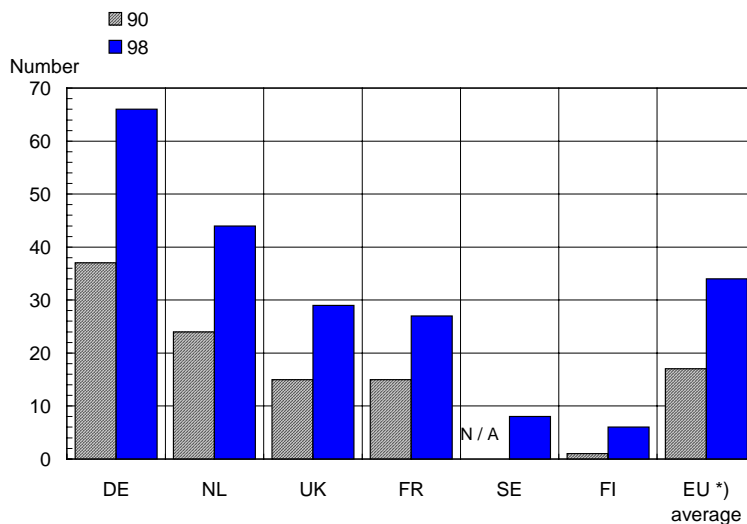
*) In 1990 : excluding Austria, Finland and Sweden, which became members in 1995

Source: ECB and Finnish Bankers' Association

Although usage of direct debits has increased substantially in all the countries, there are still wide differences in usage levels. In Finland and Sweden there were fewer than ten direct debit transactions per capita annually, whereas in Netherlands the number of transactions per capita was 44, and for Germany, which is the European leader in direct debit use, the corresponding figure was 66.¹⁹ One factor explaining the extensive use of direct debits in Germany is deduction of taxes via direct debit.

Figure 10.

Number of direct debits per inhabitant in 1990 and 1998



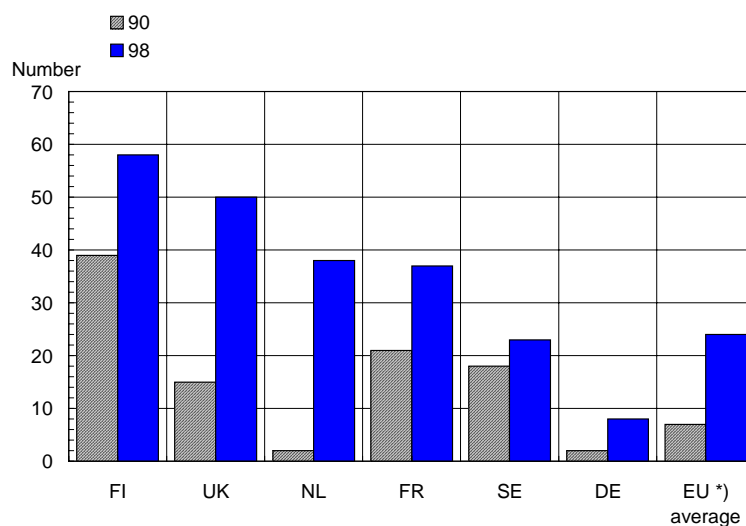
*) In 1990 : excluding Austria, Finland and Sweden, which became members in 1995

Source: ECB and Finnish Bankers' Association

¹⁹ ECB 2000.

Use of payment cards has risen dramatically in all of the countries studied. The 1990's could also be labelled as the card decade, as the increase in the use of payment card technology has been the most significant change in the use of different retail payment methods. Despite the common, rapidly increasing trend in payment card usage there remain significant differences in levels of card payments per capita. For example, in Finland the number of annual card payments per inhabitant is almost seven times as high as in Germany.

Figure 11. Number of card payments per inhabitant in 1990 and 1998



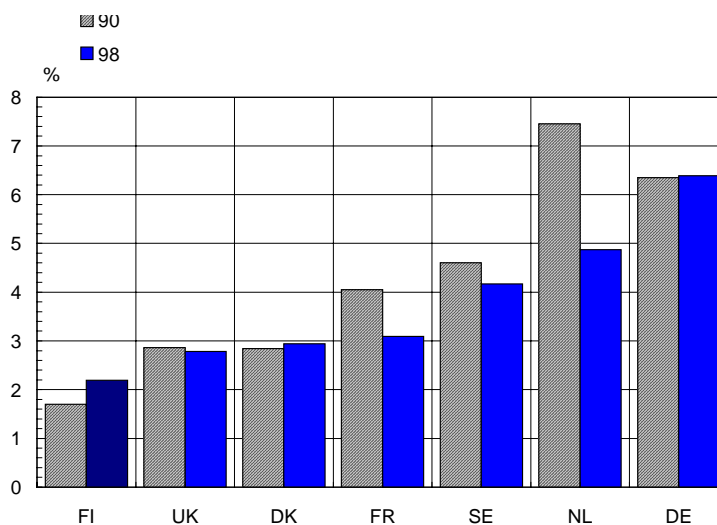
*) In 1990 : excluding Austria, Finland and Sweden, which became members in 1995

Source: ECB and Finnish Bankers' Association

Due to the openness of circulation of cash, there are no precise statistics on the use of cash. Thus it is impossible to make very detailed comparisons of the use of cash in different countries. However, one way to evaluate the relative importance of cash in making payments in different countries is to look at the ratio of cash in circulation to GDP, which should give us some indication on the relative importance of cash as a payment instrument in different countries. As can be seen from figure 13, there are marked differences between countries in this respect.

Figure 12.

Cash in circulation outside credit institutions as percentage of GDP in 1990 and 1998



Source: ECB and Finnish Bankers' Association

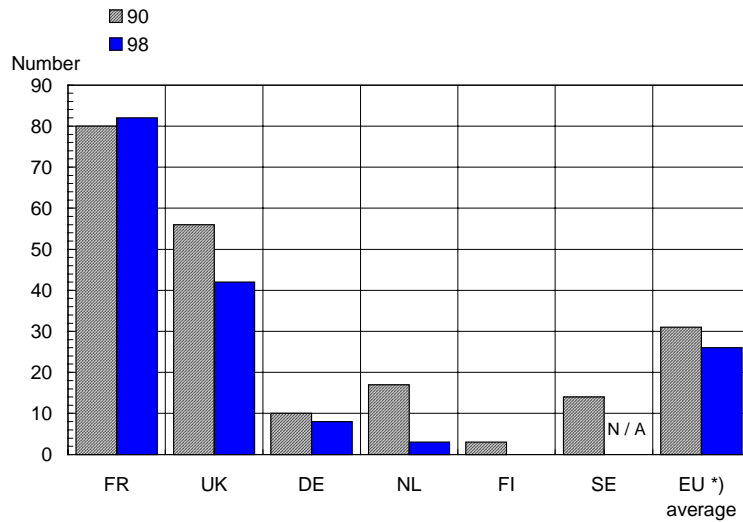
In most countries the cash-to-GDP ratio declined during the 1990s. However, in countries in which the ratio of cash in circulation to GDP was already low in 1990, eg Finland and UK, the decline was either very modest or there was actually an increase, as most notably in Finland.

There also exists a data problem with respect to the use of electronic money. Exact figures for e-money outstanding or the volume and value of e-money transactions are quite hard to come by, as the figures are often regarded as commercial secrets by the e-money issuing companies. Probably the best survey on the use of electronic money is Van Hove (2000). Using information from that survey and the Blue Book, it can rather safely be concluded that despite the fact that in most European countries e-money schemes have existed for years, the use of e-money is still not very widespread. It is probably most common in Belgium, where in December 1999 there were 7.3 million Proton cards in circulation, which were used in 4.2 million payment transactions. However, even in the countries where the use of e-money is highest, its relative importance when compared to other methods of payment is very small.

Of all retail payment methods, it is in the use of cheques that differences between countries are greatest. In several countries cheques still are the among the most widely used cashless payment media, whereas in a few countries cheques have all but disappeared from retail payment use, as can be clearly seen from figure 14.

Figure 13.

Number of cheques issued per inhabitant in 1990 and 1998



*) In 1990 : excluding Austria, Finland and Sweden, which became members in 1995

Source: ECB and Finnish Bankers' Association

In most European countries the use of cheques declined during the 1990s. In several such as Finland, cheques are no longer used to any significant extent in retail payments. An exception to this general picture of declining use cheques (at least in absolute figures) is France, where the per capita number of cheques issued actually rose (albeit slightly) in the period 1990–1998.

Overall, during the 1990's the retail payment method usage has evolved to generally the same direction in European countries. However, as addressed several times, there still are significant differences between countries. As in today's Globalised world the all countries have access to the essentially the same technology, other explanatory variables than the technology alone must be considered when explaining the prevailing differences. The next section turns back to Finland to discuss several factors which probably have affected the development of the Finnish retail payment system and may explain some of its most characteristic features.

5 Past and future of retail payments

5.1 Explaining the change of retail payments in Finland

Electronification of retail payments has progressed rapidly in Finland. This naturally raises the question of underlying reasons for the speed of development. Naturally, it is the technological development which has enabled the use of new payment methods. But this alone is insufficient to explain the change which has occurred in Finland during the last ten years, as essentially the same technical innovations have been available in other countries also. The requisite technological development is a necessary but not sufficient condition for electronification. In the following I will briefly discuss some factors that might help to explain the development of the Finnish payment system. The basic argument is that the development has not occurred only during the last ten years, but has much longer roots. Of the several factors which have contributed to development I here discuss three: competitive effects of past regulation, interbank cooperation and deregulation and banking competition.

Competitive effects of past regulation. As a result of an understanding reached between employers, employees and banks, Finland gradually adopted a 'salary bank' scheme in the course of the 1960's whereby wages and salaries were paid into bank accounts instead of cash. The changeover led to the further spread of bank accounts among the working population and hence to greater opportunities for using account-based funds instead of cash for making payments. At this time the Finnish banking sector was heavily regulated and remained so until the mid-1980s. The regulatory structure precluded the possibility of interest rate competition between banks but guaranteed them a high level of profitability. Because it was impossible to compete via interest rates or lending, the only way banks could hope to gain market share was by improving the level of services. As increasingly large numbers of Finns had bank accounts by the start of the 1970s as a consequence of the salary bank arrangement, the banks had an incentive to offer payment services that were tied to bank accounts. Moreover, since regulation ensured profitability of banking business, it was not necessary to price new services on the basis of costs. The services were offered free of charge as a means of attracting new customers. This is essentially the way things worked in Finland all the way up till the 1990s.

Interbank cooperation. Through their cooperative efforts, banks have been able to cut costs by developing and applying new technologies. In Finland this cooperation has been particularly active in the area of payment methods. One of the first results of this was the standardisation of the bank giro, in 1942, which was quickly jointly developed by banks in order to compete with Post office, which had introduced the post giro in 1939. More recent examples of cooperation between banks are the standardisation of bank and postal giro forms in 1993, which established full compatibility between the two systems, and the establishment of Automatia company for handling cash dispensers for the largest banks. Interbank cooperation has been facilitated by the positive attitude on the part of Finnish authorities.

The reasons provided by economics for why cooperation that encourages instalment of electronic payment technology is beneficial for participants in the joint systems (and arguably also socially desirable) can be roughly divided into

cost benefits (scale economies) and customer benefits (wide acceptability and compatibility).

The scale economies derived from electronic payment transfers stem from the fact that the fixed costs of setting up the necessary communication networks and terminal systems far exceed the operating costs, which results in small marginal transaction costs as volumes increase. These are usually called network economies, since the addition of participants in electronic transfer systems reduces both the average and marginal unit costs of processing payment transfers for the group as a whole. Significant cost savings can be realized by setting up joint systems or merging individual systems so as to remove overlapping functions and computer systems. The network economy effect is enhanced by the fact that consumers prefer services that offer the widest applicability, eg cards that are accepted by most retailers or compatible with most EFT-POS terminals and ATMs. Wide availability and extensive compatibility increase significantly user convenience and reduce customer transaction costs. Hence, there exist significant positive network externalities in modern payment systems.

Due to scale economies and network externalities, it seems that in payment systems a high degree of cooperation between market operators may bolster efficiency. If the banking sector is dominated by a few banks, as in Finland, cooperation may be easier to accomplish than when the market is very fragmented. Moreover, some studies indicate that cooperation is most likely to occur when banks are symmetric, ie similar in size, and the banking sector is concentrated. If the structure of banking is asymmetric, ie there are both small and large banks, a free-rider problem generally arises. This is due to the fact that small banks are usually able to obtain larger benefits from cooperation than are large banks. For example, if a cooperative payments ATM network is established, small banks benefit more than large banks, since small banks can offer their customers widely available services that they would not otherwise have been able to provide and hence can exploit scale economies associated with electronic payment services. If the large banks are unable to price access to compensate for their lost competitive advantage, they have greater incentives to invest on their own and to exclude smaller banks from the system.

Deregulation and banking competition. The situation in Finland prior to the banking crises of the 1990s was exceptional. Although payment transfers were already highly electrified by international standards, the bank branch network was still very extensive. The deep banking crisis of the early 1990s led to a significant restructuring of the Finnish banking sector. Banks were forced to drastically cut costs in order to regain profitability. Banks were forced to seek every means of cutting costs. This, combined with the consolidation of the banking sector, helps to explain the rapid downsizing of the branch networks. Moreover, since new methods of payment are cheaper to operate than traditional paper-based methods, the banks had an incentive to provide new services and to encourage their customers to use those new services.

To guide customers to use new services banks used very strong pricing incentives favouring the use of electronic methods of payment and self-service. For example, bill payments using giro ATMs were kept free-of-charge, whereas manually handled over-the-counter payments became relatively expensive. Also the newer payment methods, e.g. credit transfers via Internet, are cheap, and usually package –priced, giving customers unlimited number of transfers for a fixed monthly fee. This makes the marginal cost of an additional transaction zero, encouraging the use of Internet banking possibilities once they are obtained.

As consumers have had an increasing number of different payment methods at their disposal, they are naturally inclined to use those methods considered to be the most cost-effective and user-friendly. Electronic means of payment, eg payment ATMs, are usually time-savers as compared to traditional over-the-counter banking practices, as eg queues to payment ATMs are not usually very long. Having a variety of distant banking methods for executing payments also implies increased flexibility because their use is typically not tied to banking hours. In addition to payment ATMs and payment terminals, which are often available for use even after the bank branch has closed, Internet and mobile banks are open 24 hours a day. Thus the time and flexibility benefit combined with pricing incentives has probably encouraged customers to abandon traditional means of initiating payments in favour of new.

Finally, new methods of payment have certain infrastructure requirements. For example, the previously-mentioned wide availability of ordinary and mobile phones and computers is essential to the rapid expansion of phone and Internet payments. As Finland has the highest mobile phone density in the world and a very high Internet usage rate, wide adoption of Internet and phone banking services has been possible. Moreover, the Finnish public has generally been quite willing to accept new innovations and adopt new technologies, which may be related to the relatively high levels of education and extensive use of computers throughout the society. High levels of computer literacy may also have helped people to acclimate to the use eg of giro ATMs and the payment terminals that are replacing them.

5.2 Into the future: the changing face of retail payments?

Technological progress enables provision of new methods of payment. As discussed in section 3.2, a wide array of new payment methods will soon be coming on stream. However, the mere existence of supply does not guarantee swift adoption of new methods. If demand for new services fails to materialise, the result may be that the new innovations will not achieve the critical mass of consumers needed for a breakthrough in usage. The relatively limited success of e-money provides a good example of an innovation the use of which has at least so far failed to fully fulfil prior expectations. Also, despite the emergence of new methods of payment, the old, tried methods often remain dominant. For example, even in countries with high degrees of payments electronification, such as Finland, the use of cash is still widespread. In Finland, as mentioned in section 2.4, the amount of cash relative to GDP actually increased slightly in the 1990s.

In addition to the supply of new payment methods, demand factors should be taken into consideration when forecasting future changes in retail payment patterns. The problem naturally is that demand is inherently hard to forecast. However, if future consumption patterns incline toward 'virtual' consumption, eg distribution of information and entertainment over Internet or wireless networks, as compared to traditional goods and services, this may create increased demand for the use of new payment methods. In Finland there already are signs of slower-than-expected growth of traditional consumption, ie consumption of material goods, and at the same time, especially among young consumers, of a very rapid

expansion in the use of virtual services.²⁰ Due to reasons discussed above, if the structure of consumption changes substantially toward non face-to-face services, the resulting impact on retail payment methods and patterns may be large, because of the underlying characteristics of different payment methods.

Cash is useful only in face-to-face payments. Thus the growth of business via Internet and of wireless commerce will enhance the role of other means of payment and is likely to lead to a diminishing (at least relatively) role of cash in retail payments. At the moment the prevailing payment method used in Internet-based commerce is the credit card. In the United States 95% of online payments were conducted with credit cards in 1999. Thus the growth in e-commerce may have strengthened the role of payment cards. However, according to some studies, a substantial number of consumers would prefer other methods, including e-cash (20% of consumers).²¹ Some recent and widely publicised hacker attacks in which thousands of credit card numbers have been stolen from Internet service providers may increase the reluctance to use credit cards over the Internet and increase the interest in alternative forms of payment, such as e-money. Card-based e-money can already now be used to make purchases via the Internet using a card reader attached to a PC. However, the lack of international interoperability probably hinders the use of e-money.

Besides card-based e-money schemes, several digital money schemes, in which electronic money is stored only in the Internet, have entered the market. However, none of these schemes has made a breakthrough. Currently a 'second wave' of digital money is emerging, especially in connection with US-based companies. A new phenomenon is the emergence of Internet currencies, eg Beenz. Especially in the USA the development of new payment methods for the Internet has been very active and rapid during the last year or two. Several new schemes, eg enabling sending money with e-mail (such as PayPal and eMoneyMail) have emerged, and may, especially if the consumption patterns increasingly change in favour of virtual goods, in the long run have significant effects on the use of retail payment methods.

²⁰ Concerns about this development have been raised eg by Matti Honkala, CEO of KESKO (the biggest Finnish wholesale company) in Helsingin sanomat, 11.4.2000.

²¹ Jupiter Communications / The Economist, February 19th – 25th, 2000.

6 Conclusions

The last ten years have witnessed significant changes in the availability and use of different retail payment methods in Finland. Over a longer period, Finland has gone through several phases in the use of payment technology. Cash as a dominant form of retail payments has been on the decline since the 1960s, being gradually replaced by account-based payment methods. At first these methods, eg cheques and post and bank giros, were paper-based, but especially during the 1990s the electronification of retail payments made rapid progress. Developments in payment service availability in the 1990s were clearly bifurcate. Banks' branch networks diminished substantially as did the number of cash ATMs. The number of payment ATMs was flat until it actually declined in the latter years of the decade. As a whole, the availability of location-specific services declined.

Even as location-specific services waned, there was a surge of development of self-service methods, based on new technologies. These new methods, which make use of phones, PCs, mobile phones and open networks, drastically increased the availability of payment services regardless of location. Finland has been a world leader in the development and adoption of these new services. The relative importance of branches in banks' payment transactions declined throughout the 1990s. Currently some 90% of payment transactions are initiated using self-service, and only 10% are done over-the-counter at branches.²² The currently existing technology enables all banking services without visiting physical bank branches. Despite the sophistication of new technology, more traditional forms of services, have not been completely replaced. Even in credit transfers (in which many new means of execution have emerged) older methods still exist, but these are highly priced compared to newer methods. The banks have stated that their principle is to offer a wide range of new and traditional forms of payment services and to use pricing incentives to induce customers to use the new technologies.

The use of different retail payments methods varies markedly across countries. European countries can roughly be divided into cheque countries and giro countries. Generally, the use of cashless payment instruments has increased during the last ten years, but payment patterns are still far from converging to similar structures. The use of payment services in Finland as a whole is currently different from the general practice in most other European countries. In Finland the bulk of payment transactions are initiated using self-service methods, with PC/Internet from work or home, or payment ATMs or Internet terminals provided by banks.

Due to reduced availability of location-specific services, technological progress and pricing that favours self-service, there was a major change in the use of different payment services during the 1990s. The developing of the Finnish retail payment system has, however, much longer roots. Salary bank arrangement in the 1960s, banking regulation favouring creation of extensive services during the 1970s and 80s, and finally the severe banking crisis in the early 1990s have all contributed to the development of the current Finnish payment system. Finnish banks have also actively induced their customers to use the new services via pricing. Over-the-counter transactions are expensive compared to self services, which are often free (at least to preferred customers) or subject to low, fixed monthly fees.

²² Finnish Bankers Association 1999a, p. 15.

In the retail payments area, new technologies are developing rapidly, and these may have a significant impact on retail payment methods and patterns. Initiation of credit transfers via Internet has already made a breakthrough in Finland and is likely to grow in other countries also. Payment methods based on mobile phones are currently being introduced, and the range of services offered for mobiles is bound to expand rapidly. Whether new forms of payment succeed in gaining general acceptance and thus high rates of customer penetration, may depend on the changes in the nature of consumption. Possible changes in consumption patterns may favour certain methods of payment, eg electronic money, and speed up the replacement of more traditional means of payment, such as cash. However, in the past characteristic of the development has been the overlapping nature of different payment technologies. Many new methods of payment have emerged during the last ten years, but – with the exception of cheques in Finland – the older methods still continue to be used, even if they are more expensive than the newer ones. It seems that old habits die hard, also in making payments.

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