



The Changing Retail Payment Landscape: An overview

1. Introduction

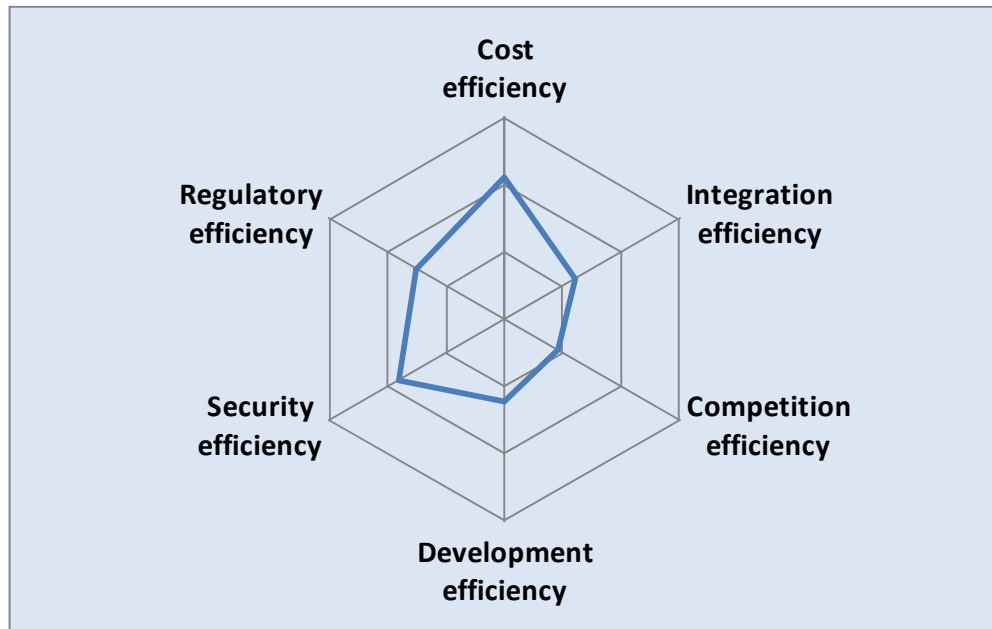
Retail payment services have been developing over recent years, based on customer needs and technology developments. The latest developments have been the introduction of electronic and mobile payments, more secure chip-based contact or contactless cards and expanding the remittance information. As some of these new forms of payments catch market shares some older forms retreat, for example the use of paper-based instruments such as cash and cheques. The trends are quite clear in retail payments

- The costs of payment processing will decrease
- the speed of payment transfers will increase until we reach complete real-time
- security features will improve in order to limit losses arising from criminality
- ease of use and integration possibilities will improve.

Although, the direction of developments seems quite clear, the speed of developments seems blurred. Payment developments have generally been slow. It seems to take almost ten years before the latecomers are ready to start employing services that early adapters have already used for years. But, the payment service providers are also slow in introducing innovations compared to other industries. For example the current difference in the speed of development between the telecommunication and the payment industries is staggering.

The retail payment landscape changes and factors affecting change will be analysed in this article by using the hexagon template described in Figure 1. The focus is on improving efficiency, as sufficient security and stability is an imperative for payment instrument acceptance in all situations. The current developments can also be seen mostly in the area of efficiency. The examples of service developments and their barriers are mainly taken from the Nordic countries and Europe, but the same kind of examples can also be found in other regions.

Figure 1: The efficiency dimensions in retail payments¹



Generally, the changes and developments seen in retail payments originate in one or several of these dimensions

- new innovations affect the cost efficiency of payments processing
- customer integration is improved resulting in lower-costs and higher efficiency when processing payments within customers' systems
- changes in the market competition setup can result both in pro and anti efficiency directions
- the market and system design itself can promote or hamper developments
- payments must be sufficiently secure at affordable costs and
- the regulatory requirements can support developments, but also maintain old conventions.

In practice, most markets show a development potential, as indicated by the blue line or irregular hexagon inside Figure 1. There is a gap between the possible achievable level and the actual level. The customer implementation lag always results in some gap, but the service providers' development reluctance also increases the lag.

The structure of this article follows the issues in the hexagon by presenting them in clock-wise order. In each subsection, the probable developments are presented together with the drivers for and barriers to change. This article aims to give an overview of retail payment developments. Therefore it deliberately covers a large area of topics and trends

¹ Adopted from Leinonen (2009)

on a general level and references are given for those interested in more detailed information.²

2. Cost efficiency developments

Cost efficiency of payments is defined in this article as the internal payment system and service provider processing efficiency. (Customers' cost efficiency is discussed in the next chapter under the title 'integration efficiency'.) Today, banks' payments processing is almost completely automated. Most paper-based processes have evolved to straight-through-processing automation.

There is a general long-term trend resulting in lower ICT costs, in accordance with Moore's law, meaning that transistor board capacity is doubled every 18–24 months at same cost level which translates to a yearly cost reduction of about 25–33%. In addition to storage capacity, the trend also seems to cover general computing power and telecommunication costs. Electronic processing costs for payments will therefore soon go down to some fractions of cents per transaction, which is comparable to the costs of sending and receiving emails or mobile phone sms-messages.

Standardisation has reduced costs in many areas such as container shipping, emailing, digital photography etc. Common standards will have the same effect on payments. All banks and clearing centres could use common open software modules for payment processing. Lately there have been good developments towards common payment standards within the ISO 20022 XML framework.³ There are also separate card standard developments for contact chip cards (EMV) and contactless cards (EMV+RFID).⁴

Electronic payment standardisation will provide the possibility for straight-through-processing via direct computer-to-computer processing in real-time mode where the files are updated immediately and corrections can be made instantaneously. There will be no "cheques in the mail" situations as accounts are updated immediately. Emails and SMS-messages would not become cheaper, if they were delayed to the following day or longer. In fact delayed payment processing in legacy batch systems increases the current overall payment costs compared to modern real-time systems. Society at large is heading towards a real-time economy.⁵

General purpose accounting, invoicing and pay roll applications can communicate directly with banks' payment systems based on common standards. E-banking will become the norm for payment customer services, thereby considerably reducing payment initiation costs within banks.

² One general reference to payment developments is Leinonen (2008), which has been used as a background document for several of the presented topics.

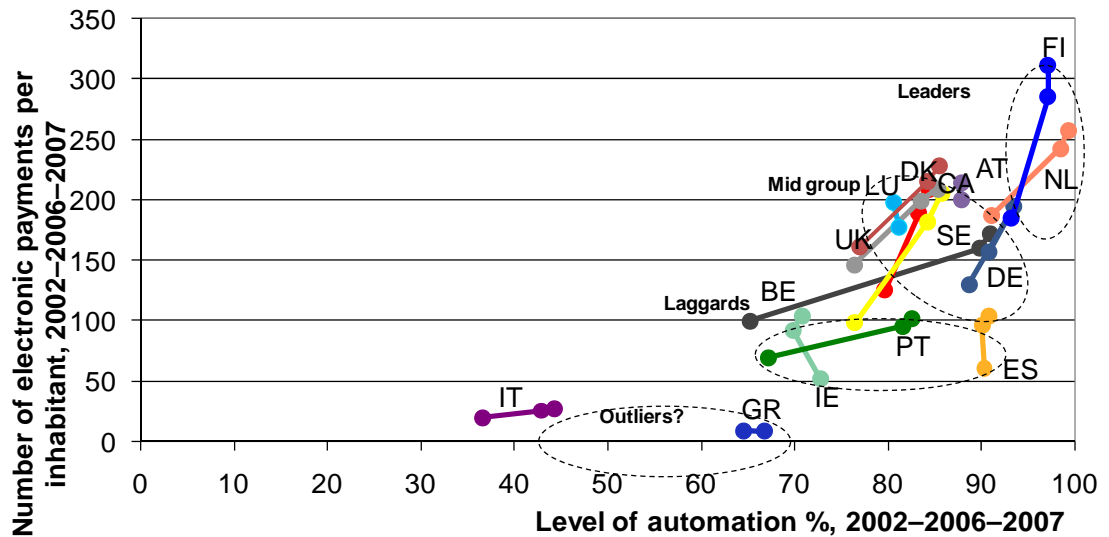
³ See www.iso20022.org

⁴ See www.emvco.org, www.etsi.org/website/technologies/rfid.aspx and Heinrich (2005)

⁵ See more at www.realtimeeconomy.net

The general business trends towards consolidation and outsourcing will also provide scale benefits and lower cost levels. SEPA (Single Euro Payment Area) is an undertaking which can create large payment system consolidation savings in the European region.⁶

Figure 2: Electronic payment and automation level developments in selected countries, 2002, 2006 and 2007



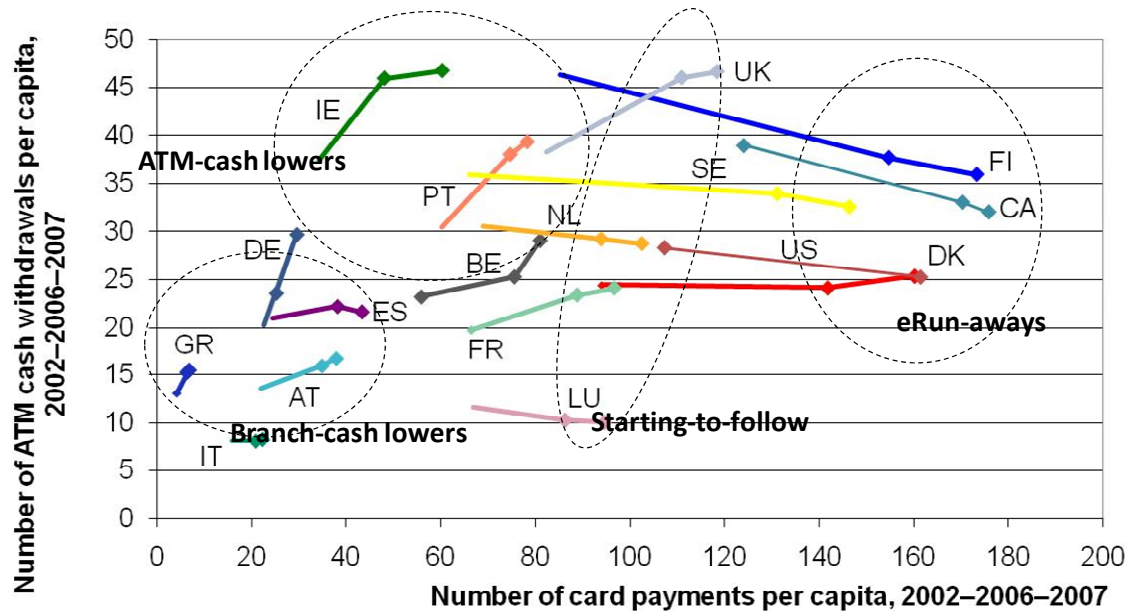
Sources: ECB, Blue Book publications, Statistical Data Warehouse and Bank of Finland.

However, although the cost benefits of using modern technology should be the same in all countries, the differences illustrated in Figure 2 and 3 are very large. Figure 2 shows on the vertical axis the number of e-payments per inhabitant and on the horizontal axis the customer automation levels (=the share of electronically presented customer payments of total customer payments). The leading countries are Finland and the Netherlands with a nearby mid-group closely behind. There are also some clear laggards and outliers, where the e-developments are very slow. (US data is not available for this graph).

Figure 3 shows the ATM usage compared to card payments at point-of-sale. The share of cash usage should decline when card usage increase. US, Canada and the Nordic Countries in Europe are clearly running away from the rest. There are some countries following but their growth is slower than that of the eRun-aways. There are countries in Europe that could be called ATM-cash lovers, in that their customers use their cards more eagerly at ATMs than directly in shops. Lastly, there is a group of countries where customers still go to bank branches to get their cash, which is the main means of making purchases in shops, as card usage is very low.

⁶ See www.sepa.eu

Figure 3: Cash withdrawals and card payment developments in selected countries 2002, 2006 and 2007

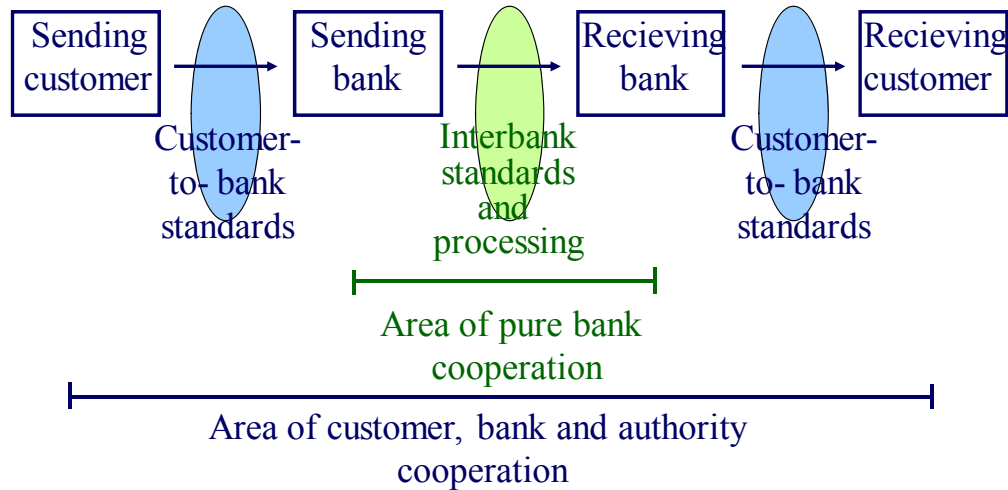


Sources: ECB, Blue Book publications, Statistical Data Warehouse and author's estimate of ATM withdrawals in Denmark.

The conclusion to be drawn from these statistics is that payment markets still are local and the emphasis on cost savings can vary greatly between countries. The reason for the low interest for costs savings is most probably the low transparency of payment costs and limited competition, which will be discussed in chapters 4 and 5.

One issue, which deserves special attention in the area of payment costs, is the establishment of common standards. Payments are part of a network-based information transportation industry. Service providers have to follow common interbank standards in order to provide services and these standards will determine the service level which can be provided to customers. The interbank data content will limit the data presented to customers. In order to support straight-through-processing (STP) at customer level, the common standards should have sufficient remittance and database key information for automatic access and reconciliation of accounts and transactions.

Figure 4: The two levels of payment standards requiring coordination



The payment standardisation issue has been discussed for years in different international payments fora, but currently it seems that the ISO 20022 XML payment standard developments would result in a comprehensive modern set of payment standards. The implementation barrier also seems to have been crossed, as it is set to become the basic SEPA payment standard.⁷ Because there are legacy forces trying to limit the content of the applied ISO 20022 in line with their legacy limitations, it would be important to ensure that the new interbank standards are comprehensive and can support customers' needs for improved payment services and standards. In fact, the best way to build interbank standards would be to first develop the customer-to-bank standards, in order to get a firm customer-driven basis for interbank standards.

The conclusions to be drawn are that technology changes are so large that payment systems will need to be redesigned based on modern technology in order to improve cost efficiency. Enhanced international interbank standards will be developed and implemented, also at national level, in the same way as emails use common global standards everywhere. Interbank clearing and settlement systems and networks will move to real-time processing and network administration instead of legacy batch operations. It is currently difficult to predict other kind of developments, but there could for example be unexpected developments due to rapid consolidation developments seen in other network industries. The only important open issues seem to be when this development will happen and by whom the development will be driven: by banks, non-banks, big customers, authorities or somebody else? There is also the danger of too much focus on service providers' costs as the main costs of payment processing can be found at customer level. Increased bank costs due to improved services can therefore be outweighed by benefits received in customers' processes.

⁷ See for example www.europeanpaymentscouncil.com

3. Integration efficiency

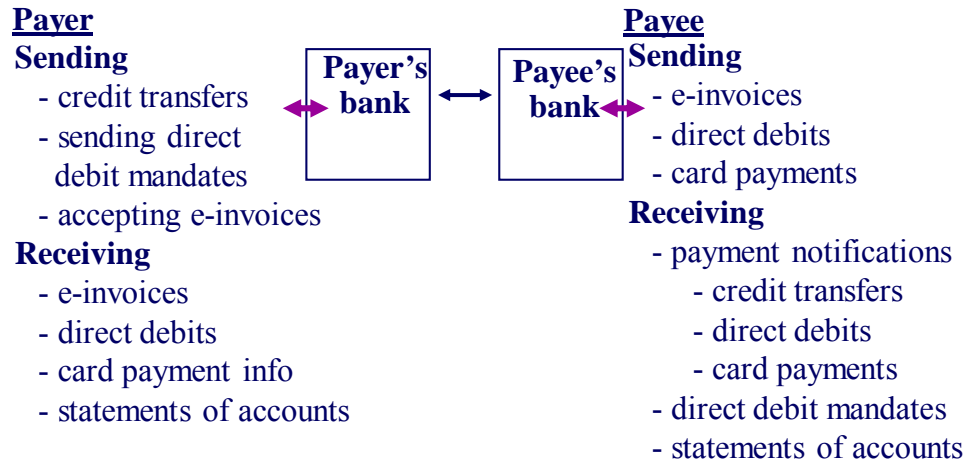
Integration efficiency determines the payment cost efficiency within the customers' payment processing. Electronic interfaces to banks' payment systems give customers the possibility for direct electronic reuse of banks' payment data. It will also provide banks with electronic input data. This will require banks to provide common customer-to-bank standards. These standards should support integration by containing sufficient information for customers' internal processes as well as customer-to-customer processing. One very beneficial development in this area is merging payment and invoicing information into an e-invoicing service. Card payments are increasing popular and customer efficiency can be increased by integrating standardised card payment modules into merchant terminals. On the drawing board, in pilots or in early production versions, we can also see mobile payment services integrating hand-sets with payment services.⁸

The e-readiness of all kind of customers is increasing rapidly. The largest companies have all automated their accounting and payment systems and many SMEs are also employing PC-based systems or using outsourced shared facilities. Smaller and smaller merchants have PC-based teller machines. A portable PC is a necessity for the young generation as well as being of great interest to most others. The mobile hand-sets used by everyone are emerging into fully-fledged mini PCs. The pressure for providing enhanced customer-to-bank integration is growing rapidly.

The basics for all kind of customer integration are the common standards for bank-to-customer communication for the most common payment services as described in Figure 5. Common standards will create the interest among software and system vendors to start provide "plug-and-play" interfaces to banks.

⁸ These kinds of undertakings can be found in almost all countries and, out of neutrality, no references are provided. It is difficult to see which of these will survive. In some developing countries mobile payments have rapidly become a main payment instrument see for example Vodafone (2007).

Figure 5: Necessary customer-to-bank payment standards

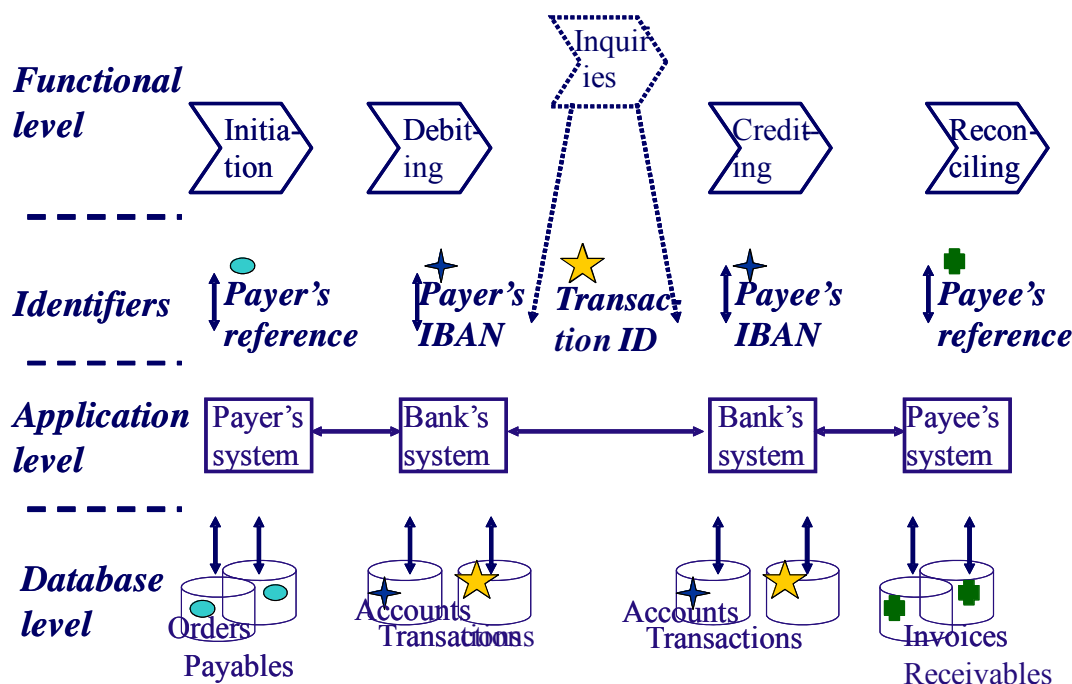


When customers act as payers they should be able to send all their payment initiation messages to their bank and receive back information on all debits and debit proposals made to their accounts. In the same way, when acting as payees, customers should be able to receive information on all credit transactions made to their accounts and also be able to send out debit proposals (card payments, direct debits and e-invoices) which will then be debited from payers' accounts. An electronic statement of account can be a major automatic accounting "device" as is the case for example in Finland. Most general ledger systems marketed in Finland can directly use electronic bank account statements, based on a common Finnish standard, as an input.⁹

Electronic integration can only be efficient when the necessary automatic addresses and references are available. The electronic payment data is stored in several databases along the processing route. The database keys for accessing the data need to be specified and standardised as described in Figure 6.

⁹ Details can be found on the web-site www.fkl.fi

Figure 6: Necessary addresses and references in efficient STP payment processing¹⁰



Payers generally have their orders and payables in databases and the information can be accessed using the correct payer's reference. In order to initiate the payment the payer has to provide the account information regarding both his own account and that of the receiver. Currently the national account number schemes vary considerably. However, the international account number standard called IBAN (ISO 13616) has gathered momentum. It will be the account number standard used in Europe in the so called SEPA (Single Euro Payment Area) and will replace all old domestic account number systems. There is a clear interest in the IBAN solution outside Europe also. Without a harmonised account numbers standard STP in payments will be impossible. It has as important to payments as the international phone number standard was to telephone automation. When the payments reach the payees, they will need a key for reconciling automatically their receivables. There is a new ISO reference code proposal called RF, which should fill this gap in the international standards. When the payee sends out any kind of invoice or payment request he states a reference code to the payer, who then attaches it to the corresponding payment. Banks transport the RF reference together with the payment through-out the payment route, so the payee can automatically reconcile the payment upon arrival. There is an inconvenient gap in the necessary reference data, as there is no international transaction ID available (only national code conventions in some countries). This would be a code defining uniquely each transferred payment, in the same way as parcel mail companies number every package they handle and which makes it possible to

¹⁰ Adapted from Leinonen (2008) p 179

follow the actual route and progress of each individual parcel in real-time. In the same way, payments should be traceable throughout the entire system via a clear identity code.

There is also a very rewarding payment development called e-invoicing. Under this service, the payment remittance information is expanded to contain all common invoice information. Electronic invoices can be processed, accessed and stored in different environments. The simplest form is to send a PDF-attachment with an email, but then it is difficult to reuse the unstructured data efficiently. However, sending the information using a common e-invoice standard makes it possible for all parties to reuse the information directly in their IT systems. Merging it with payment data makes it possible to reuse the information for synergies within payment systems. Banks are therefore in a unique position to provide value-added services to customers. Today, most customers in the Nordic countries – both corporate and consumers – employ e-banking. When e-invoice data is attached to a company's payments, the banks' statement of accounts transforms automatically into an electronic invoice archive that the customers can access and browse, whenever they have a need for invoicing data. Instead of archiving paper receipts from shops, customers can find the information from their bank statement archives using a browsing application already familiar to them from email archives. Where necessary, invoices could also be sent in electronic form directly to tax or other authorities, which would increase the efficiency in these authority processes. In this model e-invoices are routed to customers using IBANs and presented to customers via the e-banking interface for simple acceptance by clicking. E-invoicing has got off the ground well in the Nordic countries and there is increasing interest in the rest of Europe.¹¹ The European Commission has established various kinds of working parties to promote the e-invoice concept.¹²

The mobile hand-set is the most rapidly implemented device ever. Almost everybody has at least one mobile telephone. The services and features of mobile telephones are increasing rapidly, because modern phones are basically miniature PCs with very advanced communication capabilities. Because these phones can be connected to Internet, they can also be used as e-banking terminals. However, they also provide more advanced integration capabilities, when their security, storage and processing capacities are employed. The simplest way to picture the new possibilities are by visualising your normal plastic payment cards changing into digital cards stored in the phone. You will be able to see the cards on the screen and select which one to use. The card information can be updated immediately over the air. If the phone is lost, it is easy to reload the information to a new phone from a centralised back-up centre. The phone can save the data of accepted payments for automated reconciling abolishing this tedious work. Mobile payments will also need both technical and business standards in order to evolve. There is clearly a large group of younger customers who are eager to move to digital m-payments.

¹¹ See eg www.fkl.fi, www.bbs.no, www.bgc.se, www.ebacedaring.eu, www.europeanpaymentscouncil.com

¹² See European Commission (2008) European Electronic Invoicing, Final Report and Mid-term Report of the European Commission Expert Group on e-invoicing (2009).

The conclusions to be drawn from the integration developments are that this area contains the largest development benefits. The costs connected to customers' internal payment processes are much larger than the costs of the banking industry processes. Customers have a large interest in increasing the efficiency of the overall payment process. Remittance information will increase in payment messages and especially in formatted information such as references (eg RF) and addresses (eg IBAN). Re-engineering payments with e-invoicing and m-payments will provide completely new synergy effects based on modern technology. The benefits in these are so significant to customers, that banks might lose the markets to newcomers if they are slow to provide sufficient e-integration benefits to customers.

4. Competition efficiency

Sufficient competition is important for efficient developments. However, in the payment industry several factors limit competition. In most countries interbank payments are processed via a clearing house monopoly, which in most cases decides upon payment standards. Customers are often locked in by proprietary standards and fixed account numbers, which make changing service provider difficult and costly. Payments services are to a large extent priced non-transparently, which reduces price competition and increases the barriers for new entrants. The current business model and competition setup in payments is probably the largest barrier to development. However, there are developments occurring that will most probably change the current business model.

Over history, centralised clearing centres – jointly controlled by service providers – have evolved in almost all countries in the form of ACHs. These are normally in a monopolised position for interbank transfers and sometimes for company-to-bank interfaces. It is only in few, mainly smaller, countries that decentralised network-based clearing and settlement facilities have emerged. The ACH determines the regional interbank payment standards and service level, which becomes the general norm. The network force of the ACH network is strong and it is difficult to bring new services to market outside the interoperable services among banks. Each bank (or other service provider) is generally so small that providing internal extra payment services only among its customer does not catch sufficient customer interest.

New entrants have to face this network barrier and in most cases they have failed. Creating completely new networks for e-money, new card schemes, mobile payments etc are difficult. Currently there are three potential new cards schemes¹³ under discussion in Europe for the SEPA environment and it will be interesting to follow their development and competition with the established card schemes. There are several mobile payment initiatives facing the same problem.

¹³ EAPS European Alliance of Payment Systems see www.card-alliance.eu (EAPS), PayFair see www.PayFair.eu and the MONNET project established by a group of French and German banks.

In order to reduce the network power of these central institutions the authorities have required openness and fair participation rules. End-user participation in the governance of these entities can also help to ensure developments in the interest of consumers and companies. One trend, followed in some regions, has been to separate the clearing and settlement operations from payment scheme governance including setting of standards. The governance structures can then be different and there could be more competition in clearing and settlement, when there are parallel infrastructures.

Efficient payment processing requires standards for bank-to-customer communication. When banks use proprietary standards, customers become locked by the services of a specific bank. Increasing the barrier for changing service provider is in the interest of service providers, while the public interest is the opposite. Competition in payments is enhanced by common standards and we can therefore see, at least in Europe, a growing interest among authorities in payment standardisation issues.

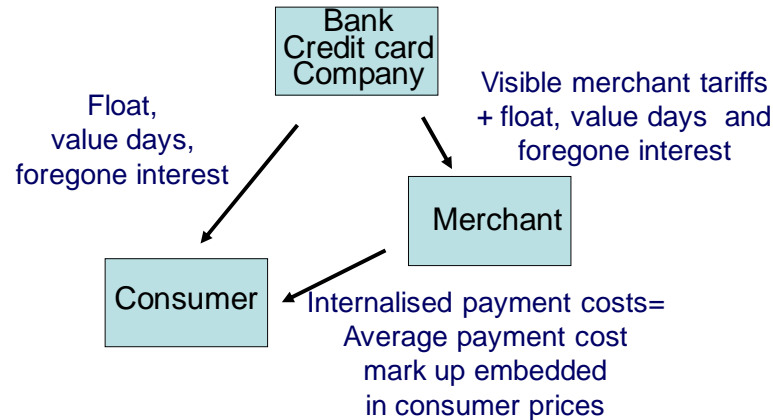
Another issue currently under debate in Europe is bank account number portability. In Europe portability for telephone numbers was already required in 2002.¹⁴ This triggered strong competition, especially among mobile telephone service providers, as customers could rapidly change service providers and still maintain their old telephone number. Changing account numbers is a barrier, especially for company customers, as well as private customers with a lot of incoming payments such as e-invoicing proposals. This is also connected to the rights of customers to transfer payment data to a new service provider or download it to their own computer. The basic question is who owns the customer data. There is a trend towards increased portability in the network industries which will probably also affect the payment industry.

The largest barrier against change is probably the current business model based on hidden and embedded pricing. Most of the banks' revenue from payment services stems from charges hidden from the consumers. There are seldom visible transaction-based consumer charges; instead there are float and value-days-based foregone interest. Merchants are often charged in a visible way for card and cash service by banks, but the no-surcharge rules¹⁵ and cash payment conventions result in merchants adding their payment costs as an average mark-up on consumer prices (and not as visible surcharges). Therefore merchants generally regard banks payment charges in the same manner as VAT, they just have to "internalise" it as such in their prices. Although the merchants pay VAT and the banks' merchant charges in the first phase, in the end the consumers pay all the payment costs without be given a choice with proper cost information (as highlighted in Figure 7).

¹⁴ See the Universal Services Directive (2002/22/EU)

¹⁵ Card transaction acquiring agreements require merchants to accept card without adding a visible charge.

Figure 7: The non-transparent pricing model of point-of-sale payments¹⁶



Customers' payment habits are then based on other criteria than prices. For example perceived free credits attract customers to use given types of credit cards instead of using cards with explicit charges for deferred debit or asking for direct consumer credits from their banks. The different merchant charges and service levels among instruments result in cross-subsidising instruments at merchant level and thereby hiding the benefits of the most cost-efficient alternatives. There is a vast amount of literature on two-sided payment markets, taking as the starting point merchant payment mark-up internalisation, where the main fallacy is in assuming that consumers would be better off with non-transparent pricing.¹⁷ As long as consumers see biased or limited price signals, price competition will be limited and banks' charges higher than in a competitive environment.

In the case of payment instruments, consumers have generally a palette to select from in shops: different debit cards, cash and different credit cards. For the merchant each accepted instrument type generally has different pricing and the merchant calculates an average mark-up to cover the payment costs. Table 1 contains an example of an average calculation for Finnish merchants. Each payment instrument has its merchant fees and based on the actual volumes, the merchant has to calculate the necessary mark-up in his case. The average mark-up in Finland was in 2007 about 0.53%. The same kind of calculation would give different results in other countries as the merchant fees vary considerable from country to country.¹⁸

¹⁶ Adopted from Leinonen (2009)

¹⁷ Rochet & Tirole (2004) and Evans & Schmalensee (2005)

¹⁸ See for example European Commission's Interim report on payment cards from 2006.

Table 1: Finnish merchant payment mark-ups in 2007 and their corresponding visible alternatives¹⁹

Card type	Banks' merchant fees	Cross-subsidisation%	Average subsidy per trans (€)	Corresponding ATM-withdrawal fee (€)	Corresponding interest rate pa
Dom. debit card	0.11%	-0.38 %	-0.13		
Int. debit card	0.33 %	-0.15 %	-0.03		
Cash	0.80 %	0.17 %	+0.02	0.80	
Visa/Mastercard	1.00 %	0.52 %	+0.32		10-14%
Other credit cards	3.50%	2.72 %	+1.71		35-45%
Average mark-up	0.53%				

The average internalisation on merchant level results, in the Finnish case, in a situation where the debit cards provide cross-subsidisation to all other means of payments due to the large debit card volumes and their relative efficiency. In Finland merchants pay rather high cash service fees to the banks and if these were changed to visible cash withdrawal tariffs it would result in an EUR 0.80 charge per current average withdrawal. The embedded credit interest for the average 35–45 days of deferred debit for credit cards in Finland translates to visible interest of 10–14% for low cost cards and 35–45% for high cost cards. As customers in Finland are fairly price sensitive, visible charges in the range of the embedded charges would probably provoke considerable changes in payment habits.

The current business model based on hidden charges promotes inefficiency because

- cost differences among payment instruments and service providers remain unseen
- end-users lack incentives to economise (compare with the discussion on disposable plastic bags)
- price competition is limited
- new efficient entrants have difficulties in entering the market, when their cost-efficiency cannot be noted
- slow development pace due to lack of price/cost incentives.

The current pricing model was efficient when cash was the dominant and the most efficient payment instrument in use. In the current situation, with more efficient payment instruments available,²⁰ maintaining the old business model supports the over-use of cash

¹⁹ See for detailed calculations Leinonen (2009) pages 187–222

²⁰ The cost of payment instruments have been studied in several European countries and the general findings are that cash is only a cost efficient instrument for very low value, coin size, transactions. For larger payments cards are more efficient

and provides service providers with extra benefits by being able to over-charge for credit card services. Changing pricing conventions is politically difficult as the majority of consumers do not realise the level of hidden payment charges and assume that visible charges would be some extra, new additions. Customers receiving subsidisation are also reluctant to lose their extra benefits. However, there seems to be an increasing comprehension among authorities that opening the payments up to transparent pricing would benefit society.

There are different ways to introduce more visible tariffs; one way would be to forbid service providers no-surcharge rules, thereby giving merchants a new alternative to choose from.²¹ Another alternative is to limit interchange fees and thereby merchant fees, as interchange fees inflate the merchant fees. When it comes to the use of cheques in the USA there is an "at par" acceptance requirement by the issuing bank. This was introduced to increase competition in the issuing and acquiring of cheques.²² This would probably have the same effect on issuing and acquiring of cards. Typical for many of the countries (see Figure 1) where cards and especially debit cards are popular is that there are no interchange fees among banks, but transactions are accepted at par between banks.

New entrants have difficulties in entering the payment markets partly due to licensing requirements and infrastructure participation rules. However, the biggest hurdle is probably the business model based on embedded pricing and cross-subsidies. Because of this, the new entrant cannot show its benefits directly to the end-users. In order to be successful it has either to be able to thrive on synergies from other business lines giving cross-subsidisation power (eg could be the case of TELCOs) or it can provide sufficiently high customer cost-savings for example via improved integration and added-value services, which make customers interested in paying sufficiently for the new advanced services (locating a good example case would probably provide the finder with ample royalties!). Authorities, for example in Europe, have tried in various ways to open up the payment market to new entrants by providing a separate e-money institution²³ and a payment institution²⁴ license, but the results will continue to be poor if the non-transparent business model is not changed.

Following competition efficiency, conclusions can be drawn: there is a general interest among competition authorities to increase competition within the payment industry by better controlling monopolies, requiring more openness, promoting portability and limiting interchange fees. The current business model based on hidden pricing is the major barrier to competition, development and new entrants. Increased competition is the best guarantor of improved efficiency and lower costs/tariffs.

means of payments. See for example Banco de Portugal (200/), Bergman & al (2007) for Sweden, Brits & Winder (2005) for Netherlands, Gresvik & Haare (2009) for Norway and National Bank of Belgium (2006).

²¹ For example the Payment Service Directive (2007/64/EC) will introduce prohibition for no-surcharge rules in Europe in 2009.

²² Connolly & Eisenmenger (2000)

²³ See the European E-money Directive (2000/46/EC)

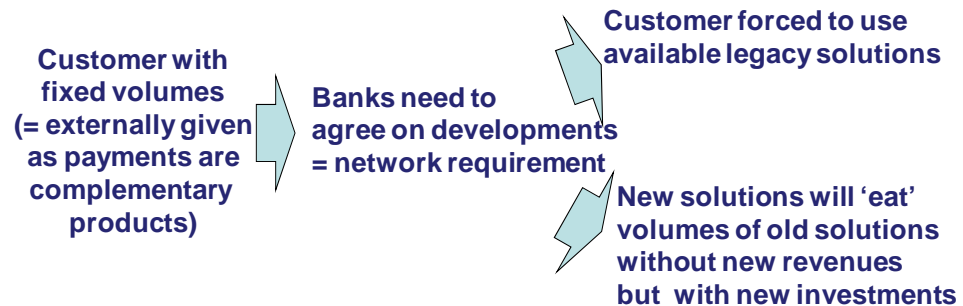
²⁴ See the European Payment Service Directive (2007/64/EC)

5. Development efficiency issues

Payment service developments are caught by what could be called a zero-sum cannibalism dilemma, which is difficult to solve. Modern standards support developments better than legacy standards. Implemented new governance structures promote better development than older structures. The area of development incentives also shows some improvements. However, payment systems and services generally show a slower development pace than comparable industries.

The zero-sum cannibalism (Figure 8) is due to customers' externally provided volumes, non-transparent charges and banks needing to agree on common developments. Payments are completely complementary products. Nobody makes a payment just for the sake of payment. There is always an agreement on an economical transaction behind every payment. The number and amount of payments are generally determined by consumers' and companies' budgets. In most cases payment costs are so small that they do not affect the overall payment volumes, in other words, users do not reflect on the payment charges when making the decision to buy or sell something resulting in a payment transaction. With a fixed overall volume, payment developments can only affect which instruments will be used by customers. An increase in one instrument will result in a similar decrease in the use of another instrument. In order to bring interoperable improvements to the market, these have to be agreed among the banks and all banks must make the necessary investments. However, this seldom increases banks' revenue as most of the current revenues are based on hidden charges independent of the selected payment instrument. For example agreeing on faster payment services would reduce hidden float revenues. It is difficult to visibly charge new products above the mostly zero-level visible tariffs of old alternatives. However, banks will have investment costs for each development. Generally, the status quo serves banks well; as there are no investments involved and customers have no other option than to use the available services. Therefore banks have generally weak interests in investing in developments serving cost reductions by customers but somewhat stronger for cost reductions by banks. However, achieving cost reductions among banks require coordination and cooperation and the cost-inefficiency is generally distributed 'neutrally' among banks.

Figure 8: The zero-sum cannibalism dilemma of payment service developments



ICT developments in general and in other network industries have progressed towards open standards which are easy to develop and have a governance structure supporting their development. This creates the basis for building 'plug and play' types of software, which we find in communication, digital music, and digital photography etc environments. XML (eXtensible Markup Language) is a new data description syntax, which is contained in the data itself and has comprehensive features for developing data content and version management. XML is used in the new ISO 20022 payment standard²⁵ and is expected to ease the development management process. There is currently a better understanding of the importance of modern e-payment standards and the need for their efficient governance. The change to ISO 20022 XML-standards will be a big step towards open and common standards in payments and will facilitate faster developments.

Customers and large customers in particular, have become increasingly interested in payment service developments as inefficient payment systems increase their cost burden. In some case large merchant chains have started their own banking service focusing basically on consumer/customer deposits, credits and payment services.²⁶ Merchants have also taken the initiative of building their own card brands and networks.²⁷ Large companies initiate and receive more than 80% of all payments. They have therefore a significant interest in common and efficient customer-to-bank standards especially when in most cases they use the services of several banks in parallel. Even a small number of large multinationals have therefore the possibility to press for these kinds of developments or even start to define the required common standards.²⁸ My personal observation is that the customer-to-bank e-standards are more developed in small economies in Europe than in the large ones. One explanation for this could be that the end-user impact is larger in small countries, where all organisations are smaller, and that there are more direct contacts on all levels between banks and company management – increasing the overall level of awareness of the potential benefits.

²⁵ See www.iso20022.org

²⁶ TESCO in UK and the S-retail chain's S-bank in Finland are typical examples in Europe.

²⁷ See for example www.PayFair.eu for Europe

²⁸ One initiative in this direction is TWIST see www.twiststandards.org

The regulators have also recognised the current development disincentives in the payment market. One way regulators have reacted is by forbidding float and value days and requesting more pricing transparency in general.²⁹ Changing the incentive structure can be a strong development driver as it changes the business model features which currently hinder development.

The development efficiency conclusions are that the current business model and complementary status of payment services are the strongest development barriers and changing the underlying incentives could be the best driver for increased and improved retail payment developments. Flexible and open standards are important for efficient change as well as sufficient end-user involvement. There is clear pressure in this direction in the market.

6. Security efficiency developments

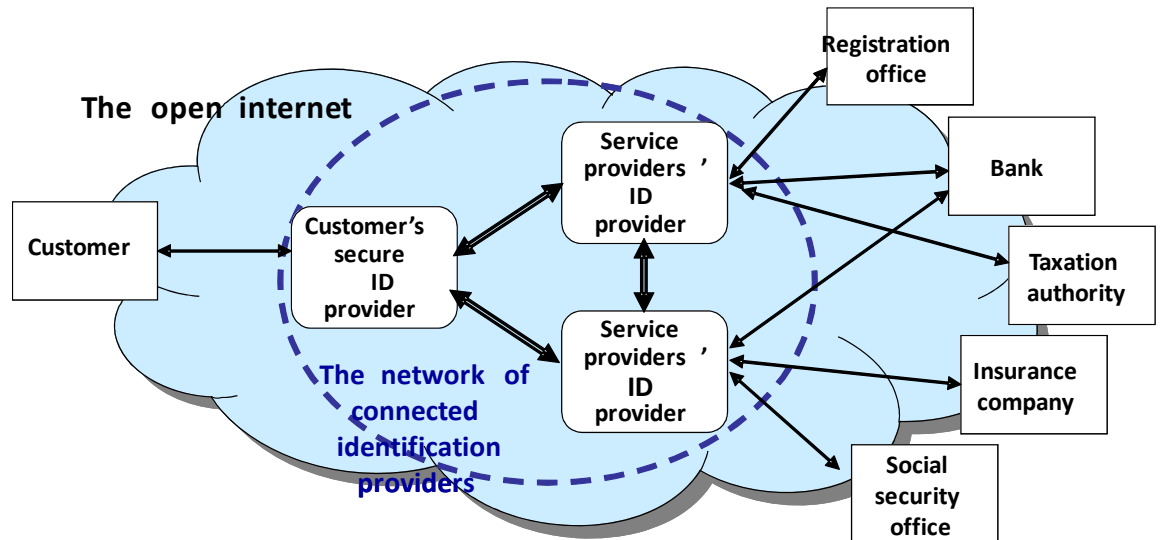
Sufficient e-security is essential for modern electronic payments. Customers have to be identified properly and therefore secure e-identification based on common standards has to be the long-term goal. This will require secure encryption and security key (PIN) storage devices for customers. Internet is the backbone of the electronic society of today, but there is a clear need to improve its overall security. Security levels can always be improved, but the investments must be in a cost-efficiency balance.

All kinds of important individual customer e-services such as e-banking, e-commerce, e-insurance and e-government (ie e-taxation returns, e-registration etc) require reliable and strong identification of the customer (see figure 9). E-identification has to be done remotely, over the open Internet, which poses major challenges. Currently most e-service providers use their proprietary solutions. For some countries there are national solutions mutually used by several service providers, but there are no true international schemes used by a large user community, yet.³⁰ The non-standardised situation is difficult for customers using several service providers. The costs are also higher and the security level is lower, when different kinds of e-identification solutions are used in parallel. For example, a low security level solution increases the likelihood for e-identity thefts. A secure solution requires a combination of secure PIN, biometric ID and physical digital device technologies. A standardised global solution would need agreement on a common trusted security administration entity. This kind of network solution will require cooperation among TELCOs, e-service providers and public authorities alike. In the same way, as official paper-based identification services are provided by public authorities there will probably be the need for significant involvement by public authorities in establishing a long-term e-identification solution.

²⁹ See for example the Payment Service Directive in EU (2007/64/EC) and the Norwegian payments legislation

³⁰ The so called 'Porvoo group' see www.porvoo12.net has been one initiative for establishing interoperability between mainly public PKI certification authorities, but there are still no actual implementations

Figure 9: The long-term goal of an open common e-identification network



Any kind of e-identification solution will be tightly connected to the encryption of payment and other information flows between the customers and e-service providers. This will require secure tamper-resistant devices connected to the communication lines and the customer computers handling payments. The current PC offerings are generally too open and there is a need for an additional security device. When GSM mobile telephone hand-sets were designed, the secure identification of the handset was important and so the chip-based SIM (Subscriber Identity Module) was constructed. Mobile phones could provide the basis for e-identification based on the SIM-card or an additional security module in the phone. Banks have moved to the more secure chip-card world by developing the EMV-standard³¹ for chip-cards and started to roll out EMV-based cards, instead of the easy-to-copy magnetic stripe cards. However, EMV-cards can only be used with secure terminals. The mobile payment developments may provide a solution for this as m-payments and e-banking could use the same identification and encryption solutions available in future mobile hand-sets. In the long-run, customers' identification 'papers' could be copied from the wallet into the mobile hand-set for more efficient and secure identification. However, even though this development seems plausible, it will require several years of technical developments and there will certainly be lengthy political debates over e-privacy issues.

Our modern society is increasingly dependent on the open Internet. Because of the very openness of internet, it has also become a playground for viruses, malware, spyware, phishing attacks, identity thefts etc. The current openness of Internet provides good hideaways for e-criminals and the probability of being caught is very low. These problems will negatively affect law-abiding citizens' interest in using Internet for their important transactions. The interest of criminals in e-criminality and the Internet will

³¹ See www.emvco.com

increase as the monetary values transferred and stored in Internet increase, as criminals are always interested in places where money is easily available. Because of the increased dependence on Internet-based services, Internet security will need more public attention, although this is also an area that easily results in protracted policy discussions about e-privacy. However, good audit-trails and good customer identification are the very basis for secure e/m-payments.

The security efficiency conclusions are that the payment industry needs to move from the current proprietary security solutions towards more standardised and common solutions, in cooperation with other e-service providers. The lack of secure and standardised solutions will, at some point, hamper e-developments regarding services requiring high security and strong identification. Tamper-resistant security devices need to be integrated into PCs and mobile phones. Increased Internet security will be required in order to increase the use of services requiring high security, as otherwise the growth of e-criminality will hinder law-abiding usage.

7. Regulatory efficiency

Regulators and other public authorities are in key positions regarding payment service developments. They can either promote developments or hinder them. There are several tools available to authorities. Various issues can be brought to the attention of the general public via basic research and information. Recommendations and leading by example when it comes to the employment of efficient solutions have a positive impact on the rest of the economy. Public entities can also provide efficient operational services, traditionally provided within central banks. This is currently placing central banks in some kind of dilemma regarding the possible over-use of cash. The strongest instruments in the tool box available to authorities are various kinds of regulations – direct rule-type or incentives affecting regulations.

There seems to be an overall increased interest among authorities in retail payments. Central banks publish increasing numbers of studies on retail payment costs, pricing and other issues.³² Completely new kinds of central banks' recommendations for retail payments have been established³³ and there is an increasing level of interest by government users in e-banking and for example requiring e-invoices has become a norm in Nordic countries.³⁴ Legislators have started to introduce detailed rules for retail payment processing in order to speed up developments.³⁵ Especially competition authorities have become active in retail payment competition issues for example by

³² Several central bank reports in this area can be found in the references in the end of the article

³³ BIS (2001, 2005 and 2006) ECB(2009c and 2009d)

³⁴ In Denmark, since 2005, there has been a legal requirement on invoicing electronically the public sector (Lov nr 1203 af 27/12 2003). In Sweden, there was a government decision, taken 14 December 2006, which required implementation of e-invoicing within government agencies by 1 July 2008. In Finland, the Ubiquitous Information Society Advisory Board established by Minister of Communication requires that government agencies should only receive e-invoices from 1 January 2010 onwards and promote consumer acceptance of sent government invoices see www.arjentietoyhteiskunta.fi.

³⁵ See for example Payment Service Directive and Norway's payment legislation

limiting interchange fees.³⁶ The increased public authority involvement seems to have a positive effect on payment developments, for example the SEPA developments in Europe would not be advancing even at the current speed if it were not for a strong authority-initiated push.³⁷

The efficiency of cash is under discussion in Europe. Cash seems to put central banks in some kind of dilemma.³⁸ Cash and especially high value notes, which are seldom used for normal payments but mainly for hoarding and criminal-type of transfers, provide central banks with ample seignorage revenue. However, from the social cost point of view, cash is currently only efficient for very low-value, coin-sized, payments.³⁹ The popularity of cash is partly in tradition and in its status as legal tender, but particularly due to cross-subsidisation and hidden pricing conventions. Today, customers only see a small part of the total cash costs. Cash also induces various kinds of criminality. All over Europe we have had an epidemic-like wave of cash transport robberies. With less physical cash in circulation, there would be reduced interest in committing all kinds of robberies and cash thefts. The anonymity of cash compared to other payment instruments increases the interest in its being used for a wide selection of grey and black transactions, tax-evasion etc.⁴⁰ Moving towards a larger use of modern non-cash payments would reduce costs to the society. There are currently big national differences in this area as can be concluded from figure 3. However, it seems politically difficult to introduce visible charges on cash as the average citizen perceives visible tariffs as tariff increases as they cannot see any reduction in the invisible embedded tariffs. However, the relative cost difference between cash and efficient non-cash payment instruments increases continuously as the physical handling costs of cash increases while the e-processing costs decreases. There will therefore be a general benefit in getting the use of cash somehow "nudged" to lower levels. Perhaps the potential ease-of-use of mobile payments will at some point in time trigger a rapid change, at least among younger citizens.

³⁶ European Commission (2007c), Macfarlane, I J (2005), Office of competition and consumer protection in Poland (2007), Weiner & Wright (2005)

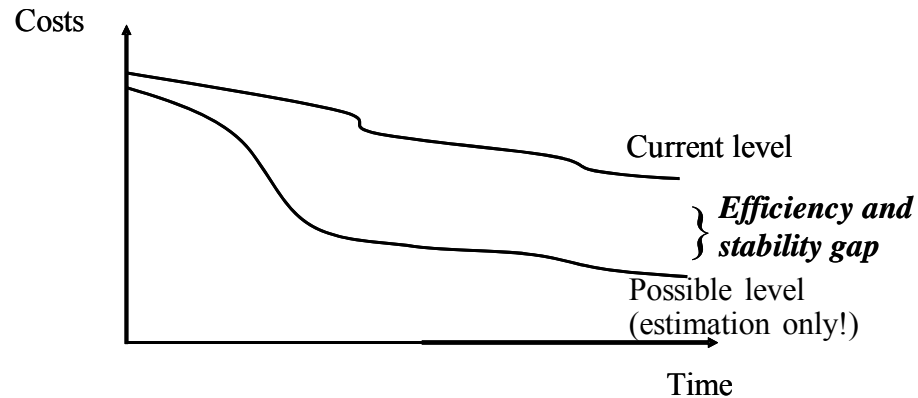
³⁷ ECB (2008, 2009a and 2009b) and ECB & European Commission (2009)

³⁸ van Hove (2007)

³⁹ Banco de Portugal (2007), Bergman & al (2007), Brits & Winder (2005), Gresvik & Haare (2009a) and National Bank of Belgium (2006)

⁴⁰ Andersson & Guibourg (2001), Humphrey & al (2000) and Paunonen & Jyrkonen (2002)

Figure 10: The increasing efficiency gap in retail payments due to the status quo⁴¹



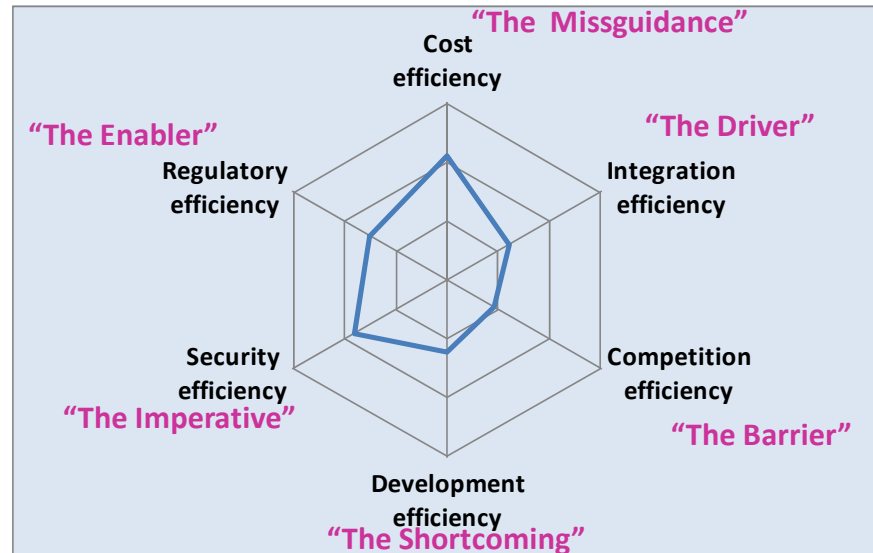
Regulatory efficiency conclusions are that the efficiency gap in retail payments increases with the status quo (see figure 10). Technology and innovations would provide more efficient solutions but the industry and customers are quite strongly locked in by legacy solutions. An active authority push seems to have positive effects in a time of change and regulatory tools seems to be required. Their implementation must be cautious as regulations can also have the opposite effect. However, old regulations – supporting legacy payment instruments – need to be abolished at the very least.

8. Closing remarks

We seem to be heading towards a "worldpay" solution with common globally standardised payment solution. In such an environment everybody will easily be able to send payments to anybody all over the world in the same way as we can send SMS-messages and emails all over the world in any language using common standardised solutions. The technology for this is already available; it is only a matter of the right incentives for development. The main question is; what are the most efficient steps we can take to reach this vision?

⁴¹ Adapted from Leinonen (2008)

Figure 11: The roles of the different efficiency dimensions



Coming back to the revised version of the initial figure (figure 11) the cost efficiency of service providers could be misleading the developments towards minimising costs of service provision, while the real driver for change can be found in customers' integration efficiency. The current business model and competition setup is probably the largest barrier which, together with the shortcomings in development efficiency, strongly maintain the current status quo. Security efficiency must be protected in all cases at a cost-efficient level. In the times of change, public regulation seems to be the enabler when the industry is locked by an inefficient business model.



References

- Andersson, M – Guibourg, G (2001) **The use of cash in the Swedish economy**. Sveriges Riksbank Economic Review 2001:4.
- Banco de Portugal (2007), **Retail Payment Instruments in Portugal: Costs and Benefits**, July 2007
- Banque Nationale de Belgique (2005) **Coûts, avantages et inconvénients des différents moyens de paiement** (Costs, advantages and drawbacks of the various means of payment).
- Bergman, M A (2003) **Payment system efficiency and pro-competitive regulation**. Penning- och valutapolitik 4/2003.
- Bergman, M – Guiborg, G – Björn, S (2007) **The Costs for Paying – Private and Social Costs of Cash and Card**.
- BIS (2001) **Core Principles for Systemically Important Payment Systems**. Committee on Payment and Settlement Systems of the Central Banks of the Group of Ten Countries, Bank for International Settlements, Basle.
- BIS (2005) **Central bank oversight of payment and settlement systems**, May 2005
- BIS (2006) **General guidance for national payment system developments**, January 2006
- Brits, H – Winder, C (2005) **Payments are no free lunch**. De Nederlandsche Bank, Occasional studies Vol. 3, Nr. 2.
- Connolly, P M – Eisenmenger, R W (2000) **The Role of the Federal Reserve in the Payments System**, Federal Reserve Bank of Boston Conference, October
- Dahlberg, T – Öörni, A (2006) **Finnish consumers' expectations on developments and changes in payment habits**. Bank of Finland Discussion Paper 32/2006.
- EBA & Innopay (2008) **E-invoicing 2008**. European market description and analysis.
- ECB (2000) **Role of the Eurosystem in the field of payment systems oversight**.
- ECB (2003) **Oversight standards for euro retail payment systems**.
- ECB (2008) **Sixth SEPA progress report**, November 2008



ECB (2009a) **Terms of reference: SEOA-compliance of card schemes**, March 2009

ECB (2009b) **Eurosystem's SEPA expectations**, March 2009

ECB (2009c) **Oversight framework for credit transfer schemes**, August 2009.

ECB (2009d) **Oversight framework for direct debit schemes**, August 2009.

ECB and European Commission (2009) **Joint statement by the European Commission and the European Central Bank clarifying certain principles underlying a future SEPA direct debit (SDD) business model**, March 2009

Enge, A (2006) **A retrospective on the introduction of prices in the Norwegian payment system**. Norges Bank, Economic Bulletin 4/06 (Vol. 77).

European Commission (2005a) **Consumer Protection in the European Union: Ten Basic Principles**.

European Commission (2005b) **Impact assessment**. Annex to the proposal for a Directive of the European Parliament and of the Council on Payment Services in the Internal Market, COM(2005) 603 final.

European Commission (2006) **Interim Report I, Payment Cards**. Sector Inquiry under Article 17 Regulation 1/2003 on retail banking.

European Commission (2007a) **Report on the retail banking sector inquiry – Inquiry into the European retail banking sector pursuant to Article 17 of Regulation 1/2003**. Competition reports.

European Commission (2007b) **European Electronic Invoicing (EEI) Final Report**. European Commission Informal Task Force on e-Invoicing.

European Commission Press release (2007c) **Antitrust: Commission prohibits MasterCard's intra-EEA Multilateral Interchange Fees**.

European Commission joint statement with ECB (2008) **Welcoming the formal launch of SEPA payments instruments by EU banks**.

European Commission (2009) **Mid-term Report of the European Commission Expert Group on e-invoicing** January 2009

Evans, D S – Schmalensee (2005) **The Economics of Interchange Fees and Their Regulation: An Overview**. Joint Center.

- Gresvik, O – Øvre, G (2003) **Costs and Income in the Norwegian Payment System 2001. An application of the Activity Based Costing framework.** Working Paper, Norges Bank Financial Infrastructure and Payment Systems Department.
- Gresvik, O. and A. Kaloudis (2001) **Increased cash holdings – reduced use of cash: A Paradox?**, Economic Bulletin No. 4 2001, Norges Bank
- Gresvik, O. and H. Haare (2008) **Payment Habits at Point of Sale in Norway. Different methods of calculating use of cards and cash in Norway**, Staff Memo No 6 2008, Norges Bank.
- Gresvik, O. and H. Haare (2009a) **Costs in the Norwegian Payment System** Staff Memo No 4 2009, Norges Bank
- Gresvik O. and H. Haare (2009b) **Costs in the Norwegian Payment System: Questionnaires**, Staff Memo No 5 2009, Norges Bank
- Guibourg, G – Segendorf, B (2004) **Do Prices Reflect Costs? A study of the price- and cost structure of retail payment services in the Swedish banking sector 2002.** Working paper series, 172. Sveriges Riksbank.
- Heinrich, C (2005) **RFID and beyond.** Wiley Publishing Inc, Indianapolis.
- H.M. Treasury (2000a) **Competition in UK Banking: A Report to the Chancellor of Exchequer.** (The Cruickshank Report).
- H.M. Treasury (2000b) **Competition in Payment Systems: A Consultation Document.**
- van Hove, L (2004) **Cost-based pricing of payment instruments: the state of the debate.** De Economist Netherlands Economic Review, Vol. 152, Nr. 1, 79–100.
- van Hove, L (2007) **Central Banks and Payment Instruments: A Serious Case of Schizophrenia.** Communications & Strategies No. 66.
- Humphrey, D – Kaloudis, A – Øvre, G (2000) **Forecasting Cash Use in Legal and Illegal Activities.** Norges Bank Arbeidsnotat 2000/14.
- Jyrkönen, H – Paunonen, H (2003) **Card, Internet and mobile payments in Finland.** Bank of Finland Discussion Paper 8/2003.



- Keinänen, E (2007) **A qualitative study to identify factors that influence Finnish consumers to change their payment behaviour.** Bank of Finland Online Series 11/2007.
- Leinonen, H (2008) **Payment habits and trends in the changing e-landscape 2010+,** Bank of Finland Expository studies A:111,2008.
- Leinonen, H ed (2009) **Evolving Payment Habits,** Bank of Finland Expository studies A:113 (forthcoming),2009.
- Macfarlane, I J (2005) **Gresham's Law of Payments.** Talk by Governor of the Reserve Bank of Australia, to the AIBF Industry Forum, 23 March.
- McAndrews, J (1995) **Antitrust Issues in Payment Systems: Bottlenecks, Access and Essential Facilities.** Federal Reserve Bank of Philadelphia, Business Review, 3–12.
- McAndrews, J (1998) **Direct presentment regulation in payments.** Research in Economics Issue 52.
- National Bank of Belgium (2006) **Cost, advantages and drawbacks of the various means of payment.** Economic Review, 2Q 2006.
- OECD (2006) **Competition and Increased Efficiency for Retail Payment Cards – Background paper by the Secretariat.** Working Party No. 2 on Competition and Regulation.
- Office of competition and consumer protection in Poland (2007) **Press release on Decision on determining the interchange fee in Visa and MasterCard system.** January.
- Paunonen, H – Jyrkönen, H (2002) **Cash usage in Finland – How much can be explained?** Bank of Finland Discussion Paper 10/2002.
- Rochet, J-C – Tirole, J (2004) **Two-Sided Markets: An Overview.** Institut d'Economic Industrielle working paper 2004.
- Vodafone (2007) **The Transformational Potential of M- Transactions.** The Policy Paper Series No. 6, July.
- Weiner, S. E. – Wright, J. (2005) **Interchange Fees in Various Countries; Developments and Determinants,** Payment System Research Department, Federal Reserve Bank of Kansas City, Working Paper 05-01

Internet sites:



Bankers' associations, service providers and banking business fora

www.europeanpaymentscouncil.com

www.fkl.fi

www.mobeyforum.org

Central banks or central banks related

www.bis.org

www.bof.fi

www.ecb.int

www.rba.gov.au

Government or government related

www.arjentietoyhteiskunta.fi

Clearing houses

www.bbs.no

www.bgc.se

www.ebaclearing.eu

www.luottokunta.fi

www.theclearinghouse.org

www.voca.com

Customer organisations

www.eact-group.com

Card payment networks

www.mastercard.com

www.visa.com

Standardisation organisations

<http://ebxml.xml.org>

www.ecbs.org

www-efaktura.no

www.e-lasku.info

www.emvco.com

www.fineid.fi

www.finvoice.fi

www.iso20022.org

www.nacha.org

www.porvoo12.net

www.svefaktura.se

www.swift.com

www.twiststandards.org