

Internet Banking in Estonia

Katri Kerem

2003

The research was financed by the International Bank for Reconstruction and Development (IBRD) for the Information for Development Program (infoDev) through a grant ICT Infrastructure and E-Readiness Assessment (Grant # ICT 016) allocated to PRAXIS Center for Policy Studies.

PRAXIS Center for Policy Studies
Estonia pst. 5a, 10143, Tallinn, Estonia
tel (+372) 640 9000
fax (+372) 640 9001
e-mail praxis@praxis.ee



Contents

1	Introduction	3
1.1	Methodology and structure of the paper.....	3
1.2	Internet in Estonia.....	4
1.3	Estonian ICT background.....	5
2	Estonian banking sector.....	7
2.1	Reforms of the Estonian banking system	7
2.2	Launching of the electronic banking	9
3	Close up of Internet banking in Estonia.....	10
3.1	Private customers.....	11
3.1.1	Motivational aspects	12
3.1.2	Available services and their usage.....	13
3.2	Corporate customers	16
3.3	Worldwide comparisons	17
4	Banking as a driver of the ICT development.....	20
4.1	The role of banks in creating modern information society.....	20
4.2	Banks as key figures in setting up electronic services in other industries.....	21
5	Analysis	23
5.1	Internet banking critical success factors	23
5.2	Policy recommendations.....	26
	References.....	28

1 Introduction

Internet has become a symbol of new era in services industry and banking is inevitably one of the leaders in taking advantage of it. Internet is a technology that spreads faster than any other technology - the use of Internet is estimated to double in every hundred days.

Estonia is considered to be a small and successful example of fast introduction of information and communication technologies¹ in spite of the fact that little more than 10 years ago it was technologically relatively backward Soviet country.

Estonia is geographically positioned between Scandinavian countries and Russia and this has been an important influence on the economic, political, social and cultural development. The growth of the Estonian economy has been fast and steady and today it is an attractive market for doing business.

The monetary reform, which introduced the Estonian kroon, conducted in June 1992, was a major turning point in economic reform. Estonia is considered by many as one of the most advanced emerging markets in Central and Eastern Europe. It has been an associated member of the European Union since 1995.

The GDP growth of 6.9 per cent in 2000 places Estonia among the fastest growing economies in the region. The economy has grown by an average of close to 5 per cent every year since 1995. The continued growth of exports to western markets, integration with Nordic countries, and institutional and regulatory reforms has thus laid a strong foundation for sustainable economic growth. The economy is likely to grow by 5-6 per cent per year in the near future² ([MFA 2002](#))

1.1 Methodology and structure of the paper

The aim of the current report is to analyze the provision of electronic banking services in Estonia in a wider context of information and communication technology usage and economic development.

The paper has drawn on a wide variety of sources including scientific research about ICT, reports of international organizations, news, available statistics and interviews with experts both inside and outside of the banking industry.

Persons interviewed were:

- Allan Sombri, Delfi Sales and Marketing Director
- Olari Ilison, Hansapank, Area Manager of Electronic Channels
- Indrek Österman, Predikaren, Banking Usability Consultant, former hanza.net's brand manager
- Tammo Otsasoo, Eesti Ühispank, Senior Manager, Electronic Banking
- Ragnar Toomla, Eesti Ühispank, Head of e-Services Department

¹ See for example The McConnell Report Ready. Net. Go! Partnerships Leading the Global Economy <http://www.mcconnellinternational.com/ereadiness/ereadinessreport2.htm>

² For more background information see the homepage of Estonian Ministry of Foreign Affairs http://www.vm.ee/estonia/kat_172/397.html

For the purpose of acquiring most up to date data short written interviews were conducted with following persons: Priit Pirso, Eesti Telefon, Lea Erik, Estonian Tax Board.

The paper is structured into five parts. The first part of the paper will acquaint reader with the Estonian economic development and the use of for information and communications technologies (ICT) in a society. The second section gives brief overview about banking in Estonia.

The third part of the paper focuses on the usage of electronic banking in Estonia covering the user characteristics, motivational aspects and available services. For a better understanding of the Estonian situation also some comparison is presented with other countries' electronic banking usage rates and dynamics.

The fourth part is increasing the understanding of banks role in the overall ICT development. The basis of the analysis is mainly qualitative interviews with industry experts.

The last part outlines crucial issues of electronic banking introduction and adoption and discusses further which kind of lessons could be learnt from the Estonian case study.

1.2 Internet in Estonia

Estonia is currently belonging to the country group of medium internet penetration on the global scale outnumbering its Baltic neighbors and Eastern-European countries but being somewhat behind from the Scandinavian countries, USA, Canada, leading European countries and some Asian countries³ ([TNS 2002](#)).

The progress can be characterized from one hand by the rising number of Internet users as presented in Figure 1 and from the other hand by the wide possibilities of using Internet as presented later in the paper. Since the year 2000 the increase of usage rates has slowed down as the market is approaching to saturation and for the first two quarters of 2002 the number of Internet users has remained at the level of 39% (Emor 2002). The main further development in the Internet usage is growth of heavy user base (i.e. existing users will use Internet more intensively) rather than growth of the usage rates in general⁴. The research on the digital divide issues has pointed out that existing motivational, skill and access barriers prevent non-users from reaching the Internet ([Digital Divide 2002](#)) and unless specific measures are taken to overcome the barriers it is not realistic to expect considerable growth of Internet use.

³ Full comparative report on Internet usage from Taylor Nelson Sofres Interactive is available at <http://www.tnsfres.com/ger2002/>

⁴ E-book Digital Divide in Estonia http://www.praxis.ee/diglohe/digital_divide_Emor_PRAXIS.pdf

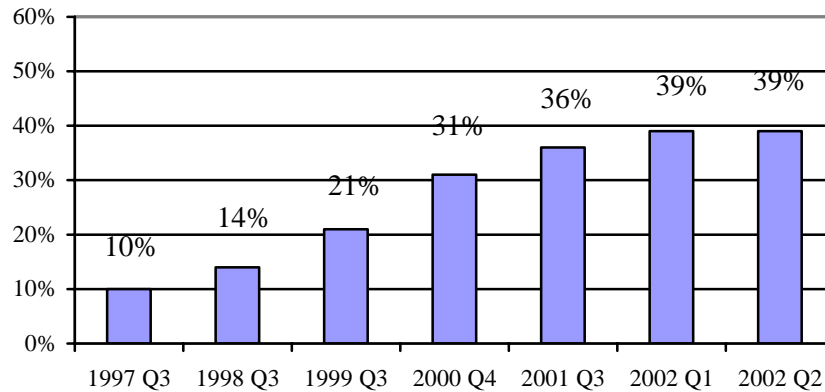


Figure 1 The growth of Internet usage among the Estonian population (source: Emor 2002)

A more detailed overview of the Internet usage rates, user characteristics and purposes of Internet can be obtained from the e-book [Digital Divide In Estonia](#).

The number of Internet users is not growing remarkably any more and the competition among the Internet service providers has intensified as many of them have lowered their prices for a permanent connection. This has motivated old users to move from slow and expensive dial up connections to faster good quality connections and has also attracted some new users to the Internet. The main place for Internet usage is still the working place but home usage is growing at a steady pace (Emor 2002). For the content providers these new developments mean more time spent in the Internet and intensive use of their services.

Those who have used Internet during a week have done it for the following purposes (Emor 2002):

- 76% sending and reading mail
- 62% searching for specific information from databases or homepages
- 57% visiting portals
- 56% using search engines
- 57% using Internet bank

So we can see that a large proportion of Internet users are also using the services of Internet bank. 57% of the Internet users have been using Internet bank during the last six months. We can infer that there is still a potential for growth in convincing people to use electronic channels for banking activities more intensively. Out of the 410000 Internet users (39% of the population aged 15-74) who have used Internet during the last 6 months also 57% have used Internet banking (Emor 2002). So we can estimate the number of Internet bank users (in the period March-May 2002) in Estonia being **233700** people. This means that 22.3% of the Estonian population aged 15-74 are using Internet bank services.

1.3 Estonian ICT background

The success of electronic banking is by and large dependent on the developments taking place in the related industries as well as on the government initiatives and

policies. The following paragraphs will give a brief overview of the background factors with relevant links for those wanting to get more familiar with the issues.

Government has a vital role in facilitating the usage ICT and also setting an example with successful applications⁵. All government institutions were pooled into portal www.riik.ee already in 1998. Estonia was first to introduce the e-government using Internet for internal public administration communication. Estonia has been also a pioneer with discussions about e-voting but currently the implementation has been delayed until 2005 (Drechsler, Madise 2002). The new e-Citizen project⁶ implemented by 2004 focuses on developing co-operation between Estonian citizens and the public sector through the Internet. The project of interconnecting state databases is meant to minimize the need for keeping duplicated information in different institutions and enable citizens to check their personal data.

Several government and NGO initiatives⁷ have made Internet accessible for segments who are of little interest to the commercial vendors - the focus has been on schools and rural areas. Tiger's Leap program has provided computers and software for the schools and has helped to connect all the schools in Estonia to the Internet thus leading to a higher degree of computer literacy among the school-aged youth. Estonia is covered with a network of Public Access Internet Points⁸ and connectivity is available also in a number of Wi-Fi (Wireless Fidelity) areas⁹ covering mainly hotels, pubs and also Tallinn Airport. A good example of the private sector interest in promoting Internet access and usage motivation and provide Internet training is the Look@World program initiated by nine companies¹⁰.

The performance of Estonian ICT cluster is based to a large extent on the developments of telecom as telecom provides substantial input to computer services and equipment production (Pihl 2001). This has also been a prerequisite for Internet usage growth because providing good quality Internet connections is vital for attracting wider public to the Internet. Estonia was one of the first countries in Eastern Europe to get foreign investments into the telecommunications industry when Telekom Finland and Telia of Sweden acquired a 49%-stake in the Eesti Telefon in 1991/92. From 1992 to 2000 Eesti Telefon enjoyed the exclusive rights for providing basic services granted by the Concession Agreement. Since 2001 the number of telecommunications companies increased remarkably (Viik 2002) which means higher competition, diversity of services and growth of quality.

Rapidly growing ICT industry has created need for well educated specialists of the field and Estonian educational system has responded to this by creating new possibilities for students both in the existing universities and also by setting up specialized IT college which will have first graduates in spring of 2003. In spite of this the major problem in the industry is still lack of qualified labor force (PW Partners 2002) as the education of the graduates is not matched well enough to the industry needs. At the same time high end specialists are competitive in worldwide markets and a brain drain to countries with higher salaries is also a problem.

⁵ About the government initiatives see <http://www.riik.ee/en/>, Estonian E-democracy report at http://www.osi.hu/infoprogram/e-government/in_estonia_proof_read.htm.

⁶For an overview about the E-citizen project see <http://www.riik.ee/ekodanik/ecitizen.rtf>

⁷ Tiger's Leap <http://www.tiigrihype.ee/eng/index.php>, Külatee (Village Road) <http://www.kylatee.ee/>

⁸ See <http://www.aip.ee/eng/index.htm>

⁹ See <http://www.wifi.ee>

¹⁰ See <http://www.vaatamaailma.ee>

Estonia has been a forerunner in creating favorable legal framework for ICT development by adopting certain pieces of information-related legislation¹¹ like Digital Signature Act (2000), Public Information Act (2001) and Telecommunications Act (2000).

The global information technology report by Harvard University has ranked the ICT development of Estonia to the 23rd place in the world¹² among 75 countries surveyed, which is for example ahead of France, Italy and Spain. Estonia was the only CEE country among the top 25.

2 Estonian banking sector

Estonian market of financial services is uniquely small and compact. Currently both the EU Peer Review and the Financial Sector Assessment Program by the IMF have concluded that most of the Estonian banking standards are comparable with best international practice (Bank of Estonia 2002).

The following subsections will provide readers with the necessary background for understanding the current situation in Estonian banking. Estonian position has been unique because of the late start which has enabled to learn from the mistakes made by other countries and avoid solutions that have not proved to be sustainable elsewhere. In countries with historically strong banking traditions the development of the banking sector has taken centuries while in Estonia the same processes have taken merely a decade.

2.1 Reforms of the Estonian banking system

Modern history of the Estonian banking industry goes back into the year 1988 when permission for the establishment of commercial banks was granted for the first time in the Soviet Union. The liberalization effort was eagerly taken advantage of and by 1990 there were already 12 banks in Estonia. The number of banks increased to 42 by 1992 and has come down to 6 plus the branch of Nordea bank by 2002 (see Figure 2).

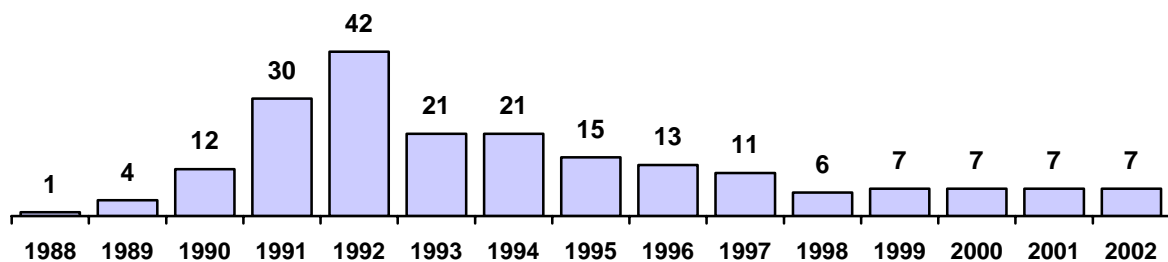


Figure 2. Number of commercial banks in Estonia (Source: Eesti Ühispank)

Setting up a bank was extremely popular in the beginning of 1990s because there were basically no legislative restrictions to establishing a bank. This meant also that banks took excessive risks which in combination with the crisis of Russian economy

¹¹ For an overview on information related legislation see <http://www.riso.ee/en/>

¹² Full report is available at http://www.cid.harvard.edu/cr/gitrr_030202.html

and the influence on Estonian monetary reform led to severe liquidity problems. Several banks were closed down, others merged in order to survive. The intervention of Bank of Estonia prevented further panic and withdrawal of deposits from other banks.

In the long run these events have had a positive impact on the banking sector as both the banks themselves and also Bank of Estonia as a regulative body adopted very cautious policies from that period onwards.

Strict requirements for banks (higher minimum share capital and license renewals) cleared the banking market and brought the number of commercial banks down to 21 already by the year 1993. With some exceptions the number of banks has since then decreased due to mergers and regroupings as the competition increased and higher minimum share capital requirements came into force.¹³

The development of the financial sector has been supported by EU adapted legal framework. The privatization of banks is completed and foreign ownership has brought Scandinavian influence into the management of the banks.

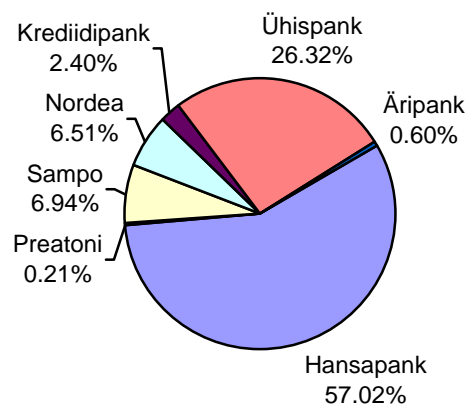


Figure 3. Market shares (total assets) of Estonian commercial banks in millions of kroons as of June 30, 2002

The Estonian banking venue has reached market saturation and there limited possibilities for new entrants. The market shares of individual banks are presented on Figure 3. The market is dominated by Hansapank whose majority owner (57.5%) is Swedish Swedbank and the second largest player is Eesti Ühispank (Union Bank of Estonia) whose strategic shareholder is SEB, also a Swedish bank. It means that today, 96.7 percent of the market is controlled by Scandinavian-owned banks, with Swedbank's Hansabank controlling 57 percent of total banking assets; Eesti Ühispank, owned by SEB, controls 26.3 percent, Nordea (which is a Finnish bank) 6.5 percent and Finnish-owned Sampo Bank 6.9 percent.

We can conclude that the market is highly consolidated. It is extremely unlikely for new entrants to become successful but it is possible to penetrate into the market via

¹³ For a thorough history of Estonian commercial banks see Estonian Banking Association home page <http://www.pangaliit.ee/>

buying a smaller bank. A rollercoaster ride through tremendous growth, liberalization of Estonia, banking crises, setting up regulatory systems and bankruptcies has ended with the emergence of balanced and modern banking environment.

2.2 Launching of the electronic banking

The term electronic banking is almost generic in its nature and therefore it is mostly used without any further explanation or definition. It should be reminded that electronic banking is not equal to the term Internet banking although the latter is undoubtedly the most widespread type of it. Electronic banking includes several traditional services like telephone banking, credit cards, debit cards, ATMs. The more recent additions are Internet banking, mobile banking and digital TV banking. Electronic banking is also known as electronic funds transfer (EFT) and basically is simply the use of electronic means to transfer funds directly from one account to another. This survey is mostly focusing on Internet banking and other methods have been included mainly for the purpose of comparison.

One of the specific features of electronic banking is that it is an add-on to an existing framework not a development of something totally new. So it is not so important to achieve critical mass instantly only in order to set up the services. Critical mass becomes important a little later with a demand for more specific services.

The history of Estonian electronic banking is only some years younger than the history of Estonian banking in general. Hansapank started its first electronic banking solution Telehansa in 1993 (Hansapank). The first banks to introduce Internet banking services in Estonia were Eesti Forekspank and Eesti Hoiupank in 1996 (Estonian Bankers Association 2001).

The greatest advantage of the late movers is that they are not rooted deep into old principles, processes and technologies. Setting up electronic banking requires substantial investments and it is very complicated to move from old technologies to new ones. In some cases worldwide the existence of a broad and well established branch office network has turned out to be a factor that has made banks see Internet as a threat rather than opportunity.

From the customer perspective electronic banking has been very well accepted in Estonia from the very beginning. Several reasons have contributed to that but the main factors are following:

- As banking in general is only some five years younger than electronic banking there had been not enough time for the customers to get used to the branch services. In the beginning years of banking the service level of the branches was not of very high quality due to the old Soviet mentalities and going to bank office to do everyday business was not associated with getting special attention and feeling of valued customer.
- The banks were still in the process of setting up their businesses and the number of branches was not sufficient in several locations. This caused long waiting lines and waste of time, which further made the introduction of electronic banking easier. The issue of cannibalizing existing business was not very serious in the case of Estonia.

Rapid adoption of new technologies has helped the Estonian banks to leapfrog some of the traps that have slowed down the process of development in countries with

better starting position¹⁴. World Bank report on leapfrogging in e-finance pointed out that the three countries with impressive progress in information technology in this sense are Estonia, Republic of Korea and Brazil (Claessens et al 2001). Creation of the world's leading electronic banking systems has been done at a remarkably low cost compared to other world class internet banks (Sahlen 2002). Estonian Internet banks have been successful with respect to both supply of services and number of active customers.

The functionality development of the Estonian internet banks has been from general and simple services towards more sophisticated ones. In 1996 the site of Hoiupank offered possibilities to view account balance and statement and execute domestic payments. Already a year later new features were added for securities transactions, international payments; viewing credit card statements, deposits and account history; sending messages to the bank and viewing a loan account. From 1999 the customers can manage their contact information and apply for loans. This was also the year when first 3rd party services and shopping options were added. Since 2000 banks have been cooperating with the tax board for both private and corporate customers and more 3rd party projects have been added. Customers can now send also e-mails from the bank's home page. Banks can be accessed via mobile phones and first e-bill solutions emerged.

Being on the Internet has allowed banks to cut costs on transactions, improve their image on the market, respond better to the demands of the market. Banks have used their sites also successfully to promote and cross sell their services and products among existing customers. Extra traffic is generated with providing non-banking services (see section 4.2). The future trend is towards selling complex solutions not only single products.

Most of the Estonian banks see electronic banking as an integrated part of their strategy and have put considerable effort in upgrading and re-designing their electronic banking solutions. Although the Internet banks have their own brand names they are not stand alone Internet banks.

3 Close up of Internet banking in Estonia

Electronic banking possibilities are provided by all major banks of Estonia¹⁵. Out of the 233700 people who use Internet bank there are obviously several who use services of more than one bank. The private customers banking portal of Hansabank is stating that they have more than 397000 registered users, which outnumbers remarkably the total amount of Internet bank users proposed by the survey of Emor. The explanation is that many of the customers have registered as users and concluded an agreement but as there is no monthly fee for the service they have also no incentive to terminate the contract if they do not start using Internet bank at all.

The analysis of Internet bank usage is complicated for two main reasons. First there is lack of data on users of multiple service providers - simply summing up the existing

¹⁴ For a specific research on the leapfrogging issues see the relevant World Bank discussion paper at <http://www.worldbank.org/wbi/banking/finsecpolicy/financeforum2002/pdf/claessglaesskling-efin.pdf>

¹⁵ See the major Internet banks: Hansapank <http://www.hanza.net/>, Eesti Ühispank <https://unet.eyp.ee/>, Sampo pank <http://www.sampo.ee>, Krediidipank <https://i-pank.krediidipank.ee/>, Nordea <http://www.nordea.ee>

accounts would give a result that is definitely larger than the unduplicated user base. Second, there is a lack of data about those consumers who have registered to use the service but have never used it.

More than any other interactive banking service, online bill payment is expanding bank's customer base, both online and offline.

According to the Forrester research, Hansabank's Internet bank hanza.net was rated as one of the European top-solutions in e-banking ranking on the 16th position. (Forrester 2000). It is the only bank from CEE to make its way into the list. In the comments on the report Forrester has marked hanza.net as a benchmark site from a smaller web leader (Neivelt 2001).

Ramsay has noted that in the United States about 20% of the bank customers represent more than 100% of the profitability and the least profitable 40% were actually drain on profit (Ramsay 1999, p 331). OECD has estimated, that by transferring bank transactions to the net the cost per transaction diminishes by 90% (OECD 2000). Unfortunately no specific survey has been conducted on the economics of electronic banking in Estonia but it is clear that the cost of transaction is remarkably lower in the electronic channels both for the bank and the customer.

The electronic self-service channels give a cost-effective opportunity to serve equally well also those customers who are not profitable in both private and business customer segments. The value of a customer may also change over time and this way a bank can create a relationship also with those customers who might turn profitable in the future. A good example here is the segment of students who have a high potential for the future and high current Internet access.

3.1 Private customers

Estonia in general is very suitable for electronic banking applications due to the relatively high penetration of personal computers and Internet access as described in chapter 1. According to the market research company Emor the percentage of Internet usage is 39% of Estonian population aged 15-74 in 2002 (see Figure 1 in section 1.2). Of course it can be argued what connection is there exactly between the Internet usage levels in general and Internet bank usage levels. A simple and straightforward conclusion would be that people who have already an Internet connection either at home or at the office will be more interested in starting to bank over the Internet. But also the opposite influence might be true: people who do not have an Internet connection (but for example have a home PC already) might have an extra incentive to acquire a connection in order to start using services of an Internet bank.

A research by OECD indicated that there is a strong positive correlation between Internet usage and e-banking usage. The trend is usually logarithmic and the take off phase of Internet banking needs at least 30% Internet usage among the population (Christiansen 2001). This can be confirmed by the actual data from Estonia: in 2000 the Internet usage increased from 21% to 31% and hanza.net's customer base grew by nearly 100% during the same year.

The heavy user group of Internet banking is aged 35-49 years and obviously the lowest usage rates are among 15-24 year olds as some of these people might not have a need for banking services yet. This is also the only age group where there is slight difference between those who have used Internet during the last week and those who

have used Internet during the last half year. Among those who have used Internet during the last week about 34% have also used internet bank. 41% of those who report to have used Internet in last half year have also used Internet bank. There are nearly no differences of usage between men and women and in fact this is one of the most equally used Internet services. Internet bank usage is nearly at the same level in countryside and in the towns and cities (Emor 2002).

The Internet bank usage rate of 22% reflects single customers, not households. There is no relevant statistics available, but it is reasonable to assume that in some cases one person in a bigger household is taking care of the banking matters of all the family members.

Moving customers to the net has to be an active process, only a small minority will show initiative to do the move as soon as possible. The early adopters are usually technologically educated and eager to try out new applications. If to use the old stick and carrot metaphor then the stick would be pricing Internet services lower than services in other channels and carrot would be freedom of time and place combined with speed.

3.1.1 Motivational aspects

Some of the factors which affect person's usage of Internet banking are pretty straightforward, obviously a person should have an access to a computer with an Internet connection either at home or in the office. It is possible to use computers with Internet connection also in some of the self service branches. The research of online shopping has pointed out that prior web experience has impact on the persons' beliefs about computers and technology in general (Crisp et al 1997, p 4) and it is quite obvious to draw a conclusion that the same applies also for Internet banking. Consumers who are on ease with computers and use them also for other purposes find it convenient to start banking over the Internet.

Although personal characteristics have been identified as significant predictors of consumers' adoption of an innovation several researchers have shown that it is the perceived attributes of the innovation itself rather than the characteristics of the innovators that are stronger predictors of the adoption decision (Black et al 2001, p 391, Polatoglu, Ekin 2001, p.157).

Clients demand a minimum relative advantage in order to switch channels. It means that the new innovative service should be perceived to be better than its predecessor. In the case of Internet banking in Estonia this is achieved via two strategies: added convenience and price incentives

The branch-banking venue is characterized by long waiting lines and slow service and it is quite logical that those who have the possibilities try to use Internet banks. The negative motivation of pricing has been successfully used by the banks. The transactions in Internet banks are either considerably lower priced or without any fee at all but for the transactions in branches the fees are very high according to the Estonian standard (See Table 1). That is definitely one of the main reasons why the branch transactions are quickly losing their popularity.

Table 1. Prices of transactions in the major banks in Estonian kroons. Source: home pages of banks as of 13.11.2002.

	Direct debit	Standing order	Internet	ATM	Branch
Hansapank	Free	2	3 (free <25, >60)	3	9-12
Ühispank	Free	3, S+ free	3 (free <25, >60, S+ ¹⁶)	Free	12 (6 S+)
Sampo Pank	Free	2	Free	NA	15
Nordea Pank	Free	4	1, free inside Nordea	NA	6-12

First the Internet services were introduced completely free of charge and after acquiring critical mass of customers the fees were introduced. The positive motivation of speed is challenged by the fact that relatively huge share of home customers still use slow, unstable and expensive dial-up connections which may make Internet banking as time consuming as branch banking. The fast connections belong usually to the companies and a big share of the consumers has Internet access from the office - which may be somewhat more convenient than visiting the bank branch but still dependent on location and office hours. The recent change in pricing occurred when Hansapank introduced a fee for the ATM transactions - it is now equal to Internet banks' fee.

Research by Emor among the customers of hanza.net revealed that the most important aspect in choosing Internet bank for all client groups was ease of use followed by functionality and easiness of finding information. Overall satisfaction with the service is high and the only aspect that was criticized was price level (Emor 2002) - it shows that consumers found the introduction of the transaction fee unpleasant but not annoying enough to discontinue usage.

The test versions of Internet banks are encouraging to people who are not so familiar with the Internet and who doubt their competence in an unfamiliar setting. They can test the user interface and various functions prior to registering as a client. In the field of services it is especially important as due to the intangibility people are frequently not able to perceive the possible gains of an innovation.

The marketing efforts made to promote Estonian Internet banking have been continuous and aggressive in different media channels and in bank branches. Avlonitis et al (2000, p 37) have made a comprehensive research showing that innovative products, which have been promoted extensively, have a higher chance of success in the market than similar products without the communications support. Two of the leading Estonian Internet banks have run TV spots and reminders both in the launch phase and after that and Nordea has promoted Solo in print media.

3.1.2 Available services and their usage

Bill payment is by far the most popular application of Internet banking. The growth of the self-service has been exponential but access to Internet is blocking further increase

¹⁶ S+ is preferential price package Saldo+ for an active private customer in Ühispank. <25 indicates customers under 25 years of age and >60 indicates customers over 60 years of age.

of the share of Internet payments. Most of the consumers who start Internet banking do it because they need to pay bills frequently and they would like to do it with minimum effort.

Besides that people use Internet bank to keep eye on their money matters, view account balance and check receiving payments from other parties. For example in Ühispank the share of different activities that customers conduct in the Internet bank is described in Figure 4.

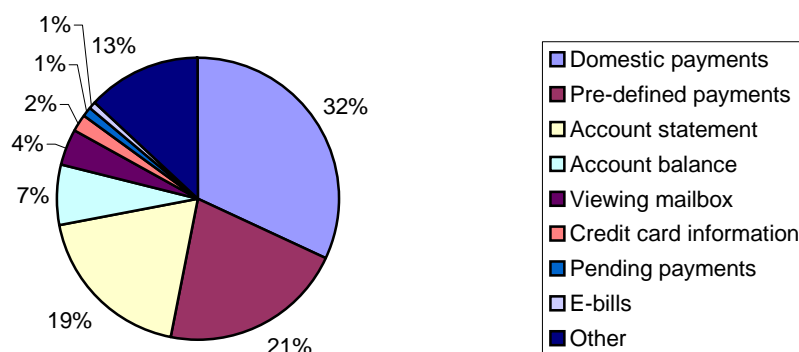


Figure 4. Share of consumers' activities in the Internet bank of Ühispank.

Figure 5 shows that in Eesti Ühispank the percentage of transactions done in the Internet has been continuously growing and in two years Internet has taken a position of the main transaction channel whereas two years before the office was dominant channel.

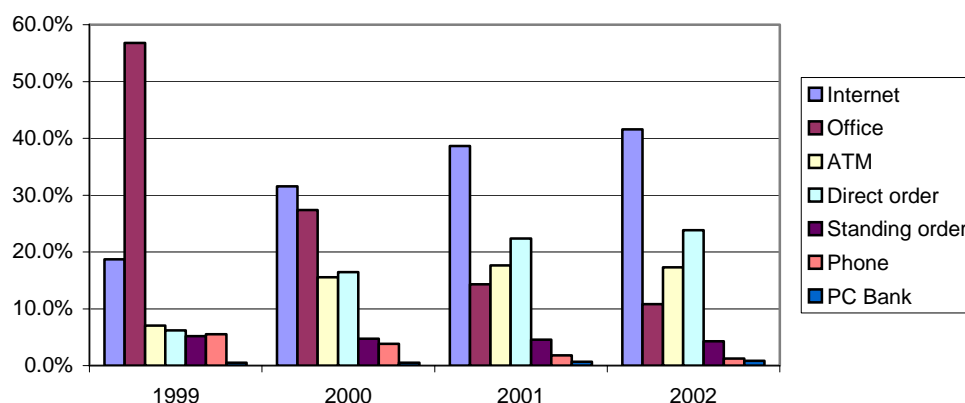


Figure 5 Usage dynamics of different transaction methods in Eesti Ühispank from 1999 to 2002 in percentages (source: author's interview)

For Hansapank only data as of January 2002 is available, presented on Figure 6. This confirms that Internet is dominant channel across different service providers.

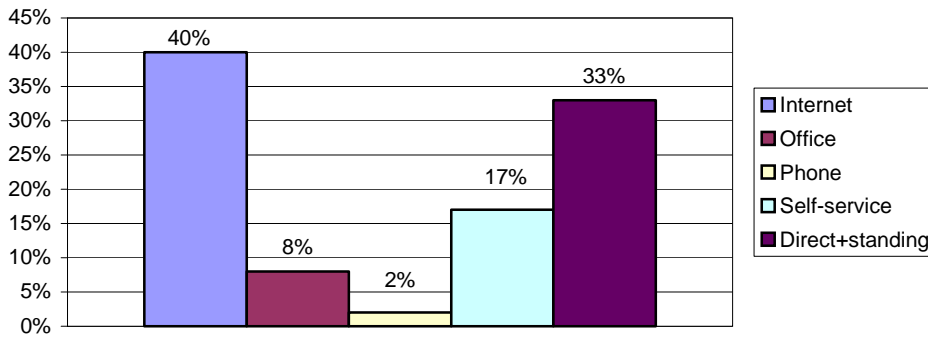


Figure 6 Usage of different bill payment methods in Hansapank in January 2002 in percentages (source: author's interview)

In Hansapank 31% of all the private clients have also Internet banking contracts and they log in an average of 4,5 times a month. If looking at the shares of payment methods it can be concluded that the clients using Internet bank are more active in using the services. The figure shows that Internet is well dominant channel or transactions for also Hansapank.

The main competitor to Internet banking is direct and standing order, which is used mainly for paying for infrastructure services like electricity, water, phone, internet, cable TV. Direct debit orders are at the moment the only payment method without a service fee.

Several analysts have suggested that the future of Internet banking lies in creating portals that offer the clients more than just financial services. Hansapank has taken first steps towards implementing the concept - its new version of hanza.net has also a section entitled "My life". Banks have made efforts to motivate consumers to use more sophisticated services of Internet banking, for example apply for a loan of pension plan. The incentive is usually also lower service fee and quicker response than in other channels. Expanding service offer gradually is cost saving to the bank as consumers train themselves with using simple applications first.

Internet banks offer their customers also a variety of wizards and loan calculators which enable them to do a "what-if" analysis before applying for a loan or deciding for an investment. The possibility of better funds management is another Internet bank benefit for its customers.

Since November 2002 there will be also wider possibilities for doing payments via the mobile phone. The service is available only to the customers of Hansapank and Ühispank and mobile payments can be done in 130 places. This is a good step further towards establishing a simple and cheap payment method, which is specifically suitable for small payments.

E-bills represent only a small share of current Internet banking activities but their importance has estimated to increase manifold in the next few years. Gartner Group analysts say that consumers prefer viewing and paying bills directly at biller websites rather than registering for a consolidated model at service provider's websites¹⁷.

¹⁷ http://www4.gartner.com/5_about/press_releases/2002_10/pr20021009b.jsp

3.2 Corporate customers

The motivation for corporate customers to take up electronic banking is considerably higher. Accountants and bookkeepers whose everyday tasks include doing huge amounts of payments have been eager to start using technologies that make their everyday work more efficient and fast. Besides that the institutional customers have also benefited from reduced costs in using the banking services. Companies increasingly use Internet-based systems to cover the entire range of their financial needs.

Electronic banking facilities speed up the cash cycle for the corporate customers and increase their overall performance as a large amount of cash management instruments are available on the Internet sites of Estonian banks (investments in overnight-, short- and long-term deposits, commercial papers, equities, bonds, money market funds).

Medium- and large-scale businesses are still mainly using PC banking solutions, which are compatible with different accounting software, thus substantially simplifying the work of accountants. The popularity of PC banks among corporate customers can be explained with several factors. Big enterprises were the first to take up electronic banking in its early days and in the beginning PC banking was the only available option. It was also featuring higher security level compared to the Internet banks of early days. And as mentioned previously PC banking is compatible with several accounting software solutions. Internet banks are currently used more by small-scale businesses.

Hansabank has a relatively new separate site called Telehansa.net for SME customers and a PC based banking solution Telehansa (where the program has to be installed in clients' computer) for large corporate customers. Hansabank has announced that in the future Telehansa.net will remain the only solution for corporate customers. The site allows getting an overview of the status of one's assets and liabilities and various statements, doing different payments and concluding and administering different contracts and agreements. An overview of the third party services offered on via Internet bank is given in section 4.2.

The second biggest bank Eesti Ühispank has also different sites for private customers and corporate customers. The Internet site for small corporate customers is U-Net Business, which allows to do domestic and cross-border payments, consolidated payments, uploading payments from accounting program, make different inquiries, save the account statement in a file, exchange messages with the bank via mailbox, order a debit card. Ühispank is also offering a PC based electronic bank via a direct modem or TCP/IP connection with the bank which is the main method of doing transactions as seen from Figure 7.

There is no data available on corporate customers' channel usage in other banks but it is reasonable to assume that the same similarities exist between different banks that were present in consumer market.

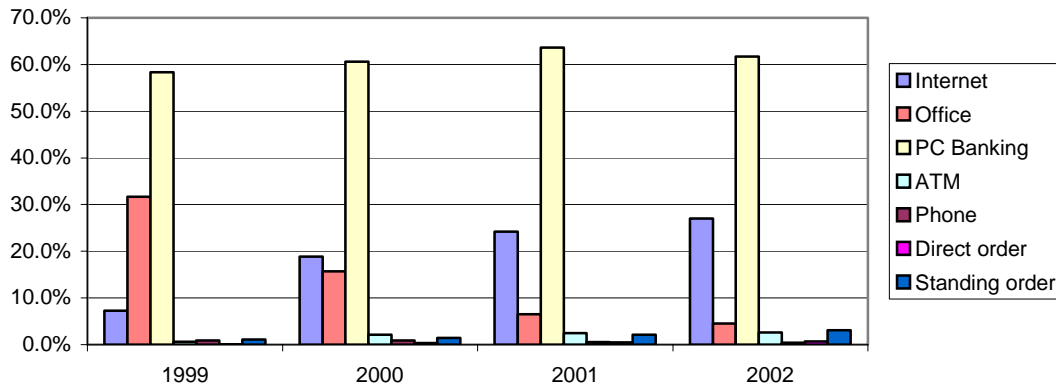


Figure 7. Transaction methods of corporate customers of Eesti Ühispank. (Source: author's interview)

Among corporate customers currently only 4,5% of the transactions are done non-electronically. It is interesting to point out that this represents 13.7% of the turnover indicating that office setting is somewhat more trusted for big volume transactions.

3.3 Worldwide comparisons

The number of Europeans banking online has increased by 19% during 6 months in 2002¹⁸ according to Nielsen NetRatings. Approximately 18.6 million Europeans visited an online bank or building society during October 2002, up from 15.6 million six months ago. This is equivalent to one in four active Internet users in the region¹⁹. In this sense Estonia stands out with one of every two active Internet users being also Internet bank user. This indicates that in the case of Estonia also background features other than Internet penetration play an important role in the Internet banking uptake.

It is fairly complicated to get a good consolidated overview of the situation in Internet banking across different countries. Quite often there is no data available whatsoever and in other cases the data is presented so that it is not possible to do direct comparisons. Unfortunately there are also severe differences in the penetration rates per country in different surveys. One of the most thorough comparisons of Internet penetration and Internet banking penetration has been done by OECD (OECD 2002) as presented in Figure 8. Estonia and Scandinavian countries show similar patterns: the adoption electronic banking is nearly 50% or more of the Internet penetration. Estonian proximity to Scandinavia and Scandinavian influence are clearly among the reasons of the fast development of ICT usage in Estonia. A recent study by the World Bank observed that "in countries where e-finance penetration has reached a level that should lead to faster growth, the level of connectivity and the quality of the business environment appear to explain the point of takeoff" (Claessens 2001).

¹⁸ <http://nyheter.idg.se/display.asp?ID=021121-EHA2>

¹⁹ <http://news.zdnet.co.uk/story/0,,t278-s2126254,00.html>

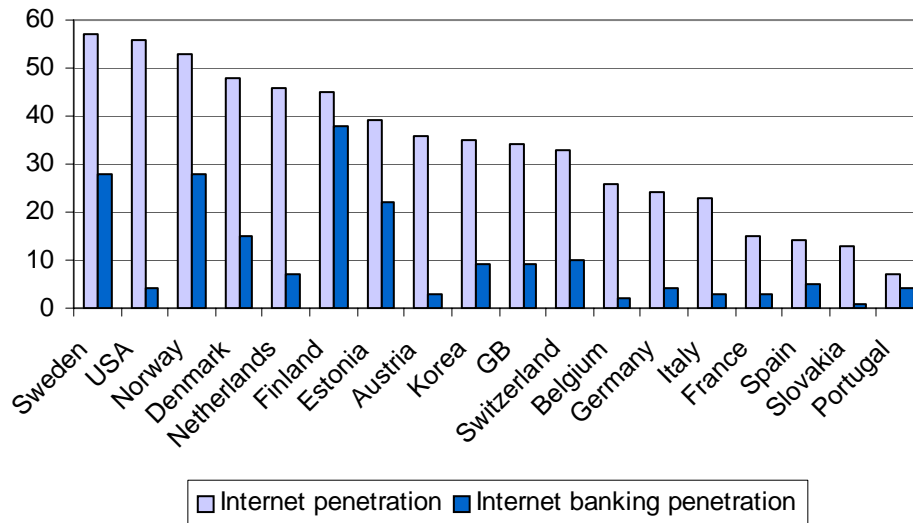


Figure 8. Internet penetration and internet banking penetration according to the OECD Financial Markets Trends Survey, April 2002²⁰. Estonian data added from Emor 2002.

Figure 8 shows that there are some exceptions to the general 30% Internet penetration rule for the electronic banking start off. Spain and Portugal, for example, appear to have much higher e-banking activity than their Internet penetration would justify, while the United States has low levels e-banking usage in relation to the massive Internet access. In the first case, the likely reason for the comparatively high e-banking penetration is the pro-active Internet strategies pursued by banks in these countries (Christiansen 2001). In the United States, the reasons for the relatively low e-banking penetration are complex: banks have not been particularly fast to embrace the new technology, retail banks are considerably less important for the day-to-day management of personal finances in the US than Europe and phone and ATM reached high usage levels prior to the introduction of Internet banking.

Finland is the closest neighbor to Estonia from this region and it would be worthwhile to look into their respective statistics concerning transaction methods.

Figure 9 presents transaction methods data for Finland where the trends are comparable to Estonia with Internet being the most popular channel. However there is no possibility to leave bills in banks for payment in the envelopes in Estonia.

²⁰OECD in Washington newsletter May 2002 at <http://www.oecdwash.org/NEWS/LOCAL/oecdwash-may2002.pdf>

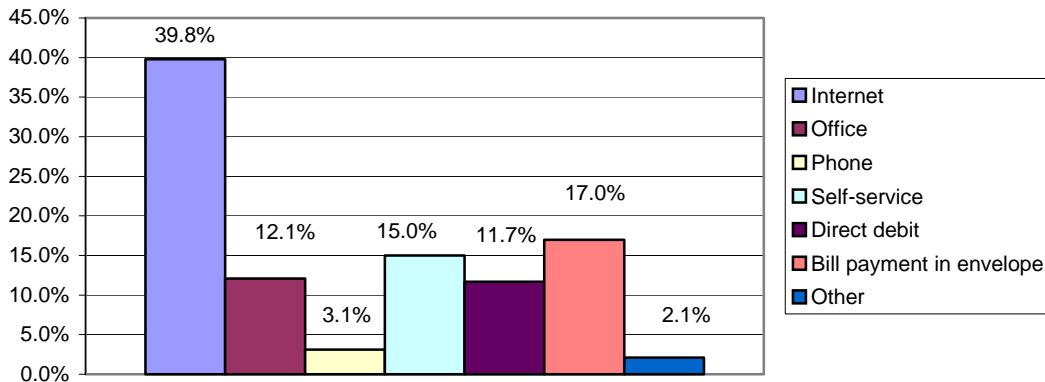


Figure 9. The distribution of payment methods in Finland (Mattila 2001, p. 70)

It is also common to compare situation in Estonia with its closest neighbors in the Baltic countries. The starting positions of the countries have been similar but somewhat different paths taken have resulted in differences in both Internet penetration and Internet bank penetration. In Latvia and Lithuania the telecommunications monopolies end on January 1st, 2003 which will probably enliven competition and bring down fixed-line communication costs²¹. Both countries also have less of web content and services available compared to Estonia. Figure 10 presents comparative data on Internet and Internet bank usage across the Baltic countries.

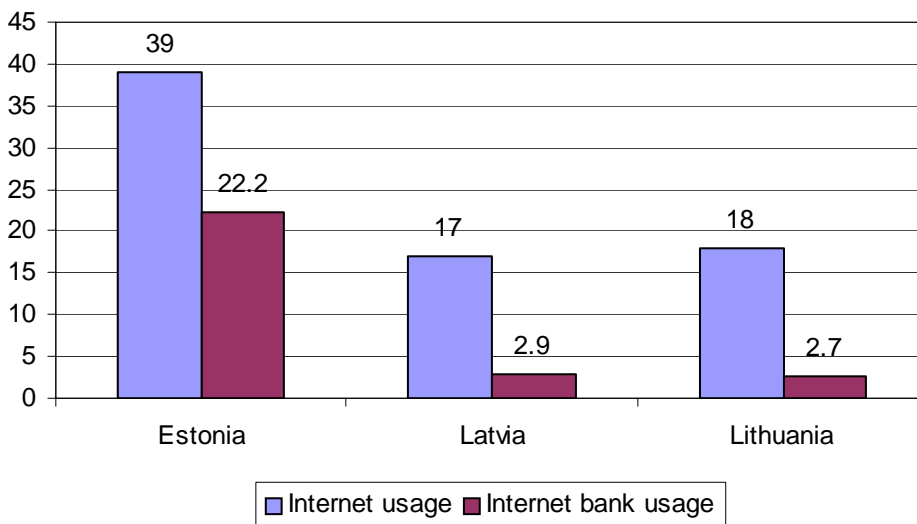


Figure 10. Comparison of internet usage and internet bank usage as a percentage of the 15-74 year old population in the Baltics²².

²¹The Global Competitiveness Report of Harvard University at <http://www.cid.harvard.edu/cr/profiles/Latvia.pdf>

²²Data on Latvia and Lithuania obtained from Emor via personal inquiry.

Great Britain is recognized for long and classical banking traditions which do not facilitate diffusion of new innovative channels. Another problem facing British electronic banking industry is high competition where each bank is fighting fiercely for its market share and no standard agreements can be reached between the players.

An overview of the British Internet Banking in The Times states that British consumers are content to use branch banking and even long queues do not convince people to use other channels. Customer figures for the entire industry have been disappointing and Internet is mainly used for searching financial information and comparing offers (Merrell 2002). In the biggest British banks (Major British Banking Groups) only about 8% of the private accounts are accessible via Internet and Internet bank is used mainly for account queries and accessing balance information (British Bankers Association 2002). The number of Internet users in GB is 38% (TNS 2002), nearly equal to the Estonian 39%. In Hansapank the percentage of private customers who use Internet bank is 31%.

4 Banking as a driver of the ICT development

During the last decade of the last century IT was leading business. Banks were eagerly taking advantage of the existing technology, as they were the ones who could afford paying for it. Now business should lead technology as utilizing technology for its own sake has proved shortsighted. The financial sector occupies a strategic position in the economy and in e-commerce.

4.1 The role of banks in creating modern information society

The role of banks in contributing to the process of creating information society is manifold as banking has important interaction with the overall Estonian ICT cluster (Pihl 2001).

First banks invest continuously in information technology as users facilitating developing advanced and customer friendly IT solutions. Estonian banks host their own IT departments, which can be viewed upon as major software companies in Estonia. In some cases banks prefer to return to their core competence and outsource other fields thus creating opportunities for smaller specialized ICT solutions providers. Banks create demand for services like cryptography, e-commerce solutions, language technologies and have thus a potential to promote innovation.

The interaction between the telecommunications sector and banking is especially noteworthy because of the joint projects with the mobile communications operators.

Secondly banks generate Internet content that has proved to be valuable for the customers. Most of the rest of the services used in the Internet are still free of charge at the time being. Banking is one of the few services where the customers are also ready to pay for what they use. The research on the digital divide (Kalkun, Kalvet 2002) pointed out that even for non-Internet users Internet banking was the only service, which was perceived as useful. Customers prefer banks as entrance points to the electronic services rather than the service providers' home pages.

Third - banks are functional intermediaries who provide payment options for other industries transact over the Internet. Banks also possess authentication systems that

have proved suitable for providing public services. The bank link services provide risk free options for e-commerce providers - clients pay for their goods prior to receiving the goods.

Fourth - banks help to generate demand for the additional services. People who are already using Internet banking are more willing to use additional e-services. Having Internet bank account gives them a possibility to pay for other services.

The fifth role of the banks strives directly from their field of operation. As a financial intermediary bank channels money into other profitable and growing industries. Information technology industry is still undoubtedly one of the most profitable and growing ones in spite of the initial hype followed by dot-com crises.

4.2 Banks as key figures in setting up electronic services in other industries.

In the first stage of setting up Internet bank banks are concentrating on offering the basic bundle of services beginning from account statements, bill payments, simple transactions. As the market matures banks move through offering more complicated financial services into setting up partnerships with other service providers.

Consuming banking services is very specific in nature. It is not comparable to consuming most of the services we use daily and which are enjoyable and playful. Danish researcher Niels Peter Mols has called banking "necessary evil" - something you rather have to do than just like to do. The partnerships Estonian banks have set up to speed up traffic on their sites are so far mainly also with the same type of enterprises whose services are more or less compulsory to large segments of population.

This is a win-win situation for both of the parties as banks usually have necessary interfaces for authorizing access and transferring funds. Cooperating with other service providers generates extra traffic on the sites of the banks and helps service providers to manage their customer relationships more smoothly. Customers can interact with third party service suppliers using their Internet bank IDs as a signature or identification.

In the first stage banks offered method for payment for the services or goods purchased over the Internet. Banks have promoted so-called bank-link intensively and have been active in seeking new partners. The link is placed on the vendors' home page where customers can enter bank after filling their shopping basket. After concluding the payment customers are taken back to the vendors' site.

It is quite natural that the bank has started with offering services that are directed to a relatively large segment of customers and also the partnerships are set up with institutions of relatively high Internet expertise - telecommunications, state authorities or providers of other types of financial services. When bringing consumers and vendors together at one site, banks can leverage the trust clients have in them and act as the intermediary to ensure billers get paid and consumers get goods and services.

Since the end of 1999 Estonian banks have engaged in co-operation projects for providing electronic services in the following areas:

Estonian Tax Board

Estonian Tax Board initiated the project in the end of 1999 with the aim of creating a possibility to submit electronic tax reports via the Internet banks for the private residents by the beginning of year 2000. In the first year 11760 electronic declarations were submitted (3% of total declarations) and in 2001 the number was already 36488 (35881 through Internet banks and 607 through the tax board homepage, 9.25% of total). In 2001 81867 private individuals submitted electronic declarations (79727 through banks and 2140 through tax board, 20.3% of total). Currently both private and institutional customers can view all their tax data and certificates in the Internet, submit reports and queries, acquire information about the paid social security tax and payments. In result of co-operation, the Health Insurance Fund and banks offer the possibility to view one's personal data in the Health Insurance Fund's register.

The usage dynamics of the Tax Board electronic services indicates that banks have central role in the project. Although it is possible to use electronic Tax Board independently less than 3% have used it. Electronic Tax Board was first introduced through the banks and although the non-bank option was added it did not prove attractive enough because of complicated login procedures and users positive experience on the banks site.

Mobile phone operators

It is also possible to order EMT and Tele2 mobile phone bills to the mailbox of Internet bank for viewing, paying and archiving bills. Currently 3.2% of Tele2 and 5% of EMT customers are ordering e-bills (service started in June 2001 in Ühispank and September 2001 in Hansapank). It is also possible to access electronic services conveniently through the mobile operators' own home page and thus the usage rates of e-services through banks are quite low.

Eesti Telefon

From August 2001 the customers of Eesti Telefon can get an overview of their client status and order e-bills through the Internet banks of Hansapank or Ühispank. The bills can be paid, viewed and archived. There are approximately 20000 users of the service and 10000 of them use it every month. E-bills are currently used by 2.75% of the customers. Eesti Telefon has pointed out the role of Hansapank in promoting different Internet based cooperation solutions in offering services to their customers.

Eesti Telefon is expecting to present 50% of their private customers' bills and 80% of their corporate customers' bills electronically in 2-3 years perspective.

Eesti Energia

Customers can submit their electricity consumption data through the Internet banks, calculate the amount due and order e-bill. Approximately 20000 customers are using the service as of October 2002 (10.2% growth compared to September and 25.5% growth from August).

The most popular applications are submitting consumption data (86.9% of users), viewing bills (47.5% of users), checking consumption data (18.5% of users) and renewing contact data (10.0% of users).

Vehicle insurance policy

In Estonia it is compulsory to carry a valid vehicle third party liability insurance contract. It is possible to prolong the insurance policy through the Internet banks since

April 2000 and currently three insurance companies have cooperation projects with the banks.

It is predicted that banks continue to be involved in providing third party services also in the future but the main access point to the service will not necessarily be the Internet bank site. The current third party services have a very wide user base and therefore it is justified to offer the also on the banks' sites. The future e-services will be targeted to narrower segments and therefore banks are not interested in displaying them on their pages to all of their customers.

This development however does not mean that banks will lose their crucial role, as all service providers need also a reliable payment instrument to sell their services. Electronic bill presentment is predicted to gain importance in the nearest future. As bill payment is a very popular electronic service already the electronic presentment can be viewed upon as an add-on or further development of the existing service.

5 Analysis

The technologic development on the global scale is taking place at a rapid pace. Therefore it is extremely necessary to take right and strategically long-sighted decisions. It is usually not wise to invent a bike - if the new bike were not able to fly. Some of the factors lying behind the success of Estonian Internet banking are inevitably linked with the specific characteristics of Estonia which cannot be duplicated elsewhere. Other reasons stem from the management philosophies and decisions, public policies and educational choices. All of the latter can be utilized at least to certain extent also in other countries.

Some of the Estonian expertise has been applied also in other countries. After the successful launch of new hanza.net the IT team of Hansapank is working on the technical aspects of the IT platform change in Swedbank. The mobile parking solution, which proved successful in Estonia, has been imported to Norway. It has been said that the information society in Estonia has already entered a virtuous circle of self-perpetuating growth. It has achieved a critical mass, which makes the involvement of the third sector of the government less necessary for further progress²³.

5.1 Internet banking critical success factors

For national banks in a country with low population density servicing outlying areas effectively can be costly. Estonia is a very small country but it has its own remote areas where online banking is the only possibility to offer banking services at all. AC Nielsen has noted that in the Nordic countries it is the combination of population density (creating the need for online banking) and an established Internet economy that has facilitated the penetration of electronic banking.

Achieving critical mass is key success factor in electronic banking development. This can be achieved when there is substantial Internet penetration and banks are able to provide services, which have very broad demand. In this case the satisfied users will

²³Estonian E-democracy Report <http://www.osi.hu/infoprogram/e-government%20in%20estonia%20proof%20read.htm>

serve as endorsers and marketers of the service. The power of person-to-person communication and word of mouth can never be underestimated.

Estonian Internet banks are successful because they enjoy a wide demographic appeal to different age segments. In countries with more mature banking industries Internet banks tend to attract younger generations who are financially not so affluent. Thus banks are also not so motivated to invest into Internet strategies.

Following analysis of the critical success factors is based on the interviews conducted with the industry experts.

Enabling environment

Internet penetration alone although being an important precondition does not guarantee online banking penetration. In general the Estonian government has taken a laissez faire approach to the regulation and supervision of the economic policy (Kalkun, Kalvet 2002). It has been pointed out in the interviews that in the evolutionary phase of new technologies and phenomena it is vital to avoid over-regulating as this can slow down and restrict development. Governments' main role is enhancing the enabling environment, as it is known that the direct intervention into financial markets may have poor results. Governments' own usage of ICT has generated positive publicity, which has fostered positive attitudes nationwide.

All of the persons interviewed for the study underlined that readiness of the telecommunications infrastructure is playing a key role in the success of Internet banking. The telecommunications monopoly of Estonia came to an end earlier than for example in Latvia and Lithuania and this is one of the explanations behind the lower Internet and also electronic banking usage in these countries. The same opinion has also been validated in international research (Claessens 2001).

Another important aspect in developing electronic financial services is the quality of the regulatory framework. Designing a public key infrastructure is a crucial question. However, it must be noted that the existence of relevant laws does not automatically mean that relevant services will be launched immediately. For example that enforcement of the Digital Signature Act did not bring along any changes in the way e-business is conducted.

Estonia features also a relatively low level of Internet connection costs. One of the explanations for this is free telecom market in Estonia, with two big competitors on ISDN market. For example, the monthly fee for ISDN connection in Netherlands is 30 euros, in Finland 65 euros and in Estonia 15 euros (Kerem et al 2002).

ICT usage promotion initiatives

Obviously the level of Internet usage is important for the success of Internet banking but internet penetration alone does not guarantee online banking penetration.

The initiatives most commonly pointed out by the respondents were those combining Internet access with relevant training for wider segments. The importance of the Tiger's Leap program is based mainly on the fact that it has succeeded to connect all the schools to the Internet and the future gains from this initiative are expected to be high. Look@world project was mentioned mainly because one of its aims is to provide basic computer and Internet training for 100 000 persons who are currently not using Internet. The importance of the Public Internet Access Point network is twofold. Besides providing possibilities to use Internet for wider public the initiative

has also generated positive media attention, which has helped to shape favorable public opinion towards technology use.

Another possibility is to promote the Internet as a channel for accessing information and using services via adding content that is relevant and useful for the target groups. From among the several web services the tax board and e-government were pointed out most often.

Market characteristics

Experience from other European countries shows that Internet banking is stronger and has started off earlier in countries with a few major players (Sweden, Finland, Estonia) (Economist 2000) compared to highly competitive markets (like UK and also Norway).

Late start of contemporary banking in general has contributed to the rapid adoption of most up to date technologies as old technologies can be very expensive to develop further. Some of the Scandinavian banks are still dependent on the information systems of the 1970s. There are no old payment methods used in Estonia like Giro system in Scandinavia. Lithuanian banks decided to continue using book payments and are now having hard time trying to re-train their customers to start using Internet.

As mentioned previously the small size of the market is positively linked to the development of Internet banking as banks can cooperate closely in the field of developing standards to offer services to third parties. Up to now, all developed standards are public and are not patented, that allows fast and coordinated spreading of bank-link, and ATM. Common standards are useful and efficient not only for users of these services, but also for brick-and-mortar and virtual shop owners, as the implementation of common standards does not require considerable technological expenses. In Finland, for example, there are multiple technological standards for some e-banking services that complicate fast spreading of these innovations (Kerem et al 2002).

Management aspects

There are also some management aspects, which have made it possible to achieve 22% of Internet bank usage rate. Estonian banks have adopted a long-term perspective - implementing Internet in banking is not a campaign but long-term process which is looked upon as an investment, not an expense. Although price incentives can play significant role in getting customers online the service needs to be based on quality rather than price only.

Developing technological solutions should was not done with a product or line of business in focus but with a customer relationship focus with integrated delivery of products and services. Success or failure in Internet banking is greatly determined by the integration of technology infrastructure with the business processes.

The Estonian experience suggests that multi-channel strategy is most viable with different channels complementing each other and catering for different needs of the customers. It should be also pointed out that Estonian Internet banks have simple and clear user interfaces and the pricing policy has favored using electronic channels. A critical factor for changing customer behavior is a feeling of comfort and security. Estonian banks have been successful in delivering user-friendly solutions that are secure, and are also perceived to be secure.

Estonians are generally very technology prone and the small size of the market gives excellent conditions to experiment with new solutions.

5.2 Policy recommendations

Top of the art Internet banking is useful for a society for different purposes. Using extensively electronic channels increases market transparency and consumers are able to compare service offerings easier. As noted previously Internet bank users are more willing to use also other services on the Internet. According to a research conducted in Estonia 2001 in by Aarma and Vensel) bank customers use bank office services on average 1.235 times per month, and wait in queue in bank office on average for 0.134 hours. Simple calculation shows, that making payments via e-banking facilities (for instance using Internet bank) rather than in the bank offices create overall economy savings in the amount of 0.93% of GDP (Average distance to nearest bank office is 4.14 km which takes approximately 0.21 hours to travel. Estonian GDP in 2001 was 10 billion kroons and average hour wage is 35.40 kroons. There are 0.5 million citizens, who use brick-and-mortar bank facilities in Estonia). (Kerem et al 2002).

Developing conditions necessary for Internet banking growth in a society are not in the interest of any single stakeholder but benefits different groups: consumers, public sector, private companies in both financial services and other fields.

It is worthwhile to bear in mind that Estonia is just one successful case of rapid Internet banking adoption and although some general guidelines can be given it is impossible to duplicate the whole model in another country with different background features.

1. Internet access itself is not sufficient for Internet usage (and further Internet bank usage). It is necessary to provide content, which is relevant to different segments and would motivate their Internet usage.
2. It is vital to increase efforts to promote Internet training and provide learning systems for general public who do not have possibilities to get relevant education either at school or at work. Education will increasingly be a key contribution to the recruitment of new users.
3. As it is increasingly difficult for persons who do not have Internet access or skills to keep up with the development of society, therefore it is crucial to pay attention to bridging the digital divide. High-end heavy users are already motivated to keep up and train themselves.
4. Cooperation between state institutions and banks in providing public services creates Internet content that is valued by the customers and motivates them to move from offline services to online services.
5. Positive technology attitudes enable faster diffusion of Internet based services. Awareness creation in the general public and goodwill among both adults and the younger generation is an enabling factor for the electronic services uptake.
6. Effective laws will vastly accelerate the development of Internet banking - especially laws concerning digital signature. Effective privacy protection laws considering the Internet environment will help to build trust and consumer confidence.

7. Sensible regulation of the telecommunications field, end of monopolies and creating conditions for competitive market will create wider possibilities of Internet usage both for the private consumers and businesses. In monopolistic conditions the cost of connection will often inhibit the diffusion of Internet.
8. The development of Internet banking is also dependent on the overall conditions of the financial services market. Effective reorganization, stabilization and regulation is a pre condition for provision of electronic services.
9. General business open-minded business culture that values technological development and is eager to try out new advanced solutions has also been an important aspect of Estonian Internet banking development.

References

1. Avlonitis, G. J, Papastathopoulou, P Marketing communications and product performance: innovative vs. non-innovative new retail financial products millennium // International Journal of Bank Marketing, 2000 18/1 pp 27-41
2. Bank of Estonia, <http://www.ee/epbe>
3. Black, N. J, Lockett, A, Winklhofer, H, Ennew, C. The adoption of Internet financial services: a qualitative study // International Journal of Retail and Distribution Management, 2001, Vol 29, Number 8, pp 390-398
4. British Bankers Association. Abstract of Banking Statistics 2001.
5. Christiansen, H. Electronic Finance: Economics and Institutional Factors. OECD Financial Affairs Division Occasional Paper No. 2, 2001
6. Claessens, S, T. Glaessner and D. Klingebiel. E-Finance in Emerging Markets: Is Leapfrogging Possible? //Financial Sector Discussion Paper No. 7 World Bank June 2001
7. Crisp, B., Järvenpää, S., Todd, P. Individual Differences and Internet Shopping Attitudes and Intentions. Working Paper. University of Texas. Unpublished 1997, 19 p
8. Drechsler W. and Ü. Madise. E-voting in Estonia // Trames 3, 6, 2002
9. Eesti infotehnoloogia ja telekommunikatsiooni sektoruuring. Sihtasutus Eesti Kutsehariduse Reform, PW Partners 2002
10. Emor. E-seire aruanne märts-mai 2002
11. Emor. Hansapanga klientuuri rahulolu. Jaanuar 2002
12. Estonian Bankers Association. Brief History, Estonian Commercial Banks in 1988-2001. <http://www.pangaliit.ee/1988-2001eng.pdf>
13. Estonian Ministry of Foreign Affairs <http://www.mfa.ee>. A Dynamic Economy http://www.vm.ee/estonia/kat_172/397.html
14. Ewing, T. Online Banking in the Nordic Region. Nielsen/NetRatings Close-up, April 26, 2001
15. Forrester Research. Best of Europe's Net Banking, November 2000
16. Global Information Technology Report 2001-2002: Readiness for the Networked World. The World Economic Forum and the Center for International Development (CID) at Harvard University
17. Kalkun, Mari and Tarmo Kalvet, eds. Digital Divide In Estonia and How to Bridge It, Emor and PRAXIS Centre for Policy Studies, Tallinn 2002
18. Kerem K., O. Luštšik, M. Sõrg, V. Vensel. E-Banking In Estonia: Development, Driving Factors and Effects. 10th Annual Conference on Marketing and Business Strategies for Central & Eastern Europe. Vienna 2002. Unpublished

19. Mattila, M. Essays on Customers in the Dawn of Interactive Banking. Jyväskylän Yliopisto 2001
20. Merrell, C. Not such a big queue for online banking. The Times (London) April 17, 2002
21. Neivelt, I. Hansa e-xperience. Presentation on the Baltic Sea Region e-Business Forum, September 27, 2001 OECD in Washington. No. 34. May 2002 OECD. A new economy? The changing role of innovation and information technology in growth. OECD Report, Paris 2000. Pihl, T. Analysis of Estonian IT Sector Innovation System. Estonian ICT Cluster: Present state and Future Outlooks. Archimedes Foundation 2001. Available http://www.esis.ee/eVikings/evaluation/eVikings_ICT_cluster.pdf Polatoglu, V. N., Ekin, S. An empirical investigation of the Turkish consumers' acceptance of Internet banking services // International Journal of Bank Marketing, 2001 19/4 pp 156-165
26. Ramsay, J., Smith, M. Managing customer channel usage in the Australian banking sector. // Managerial Auditing Journal 14/7, 199, pp. 329-338
27. Sahlen, A. Foreign Bank's Entry into the Baltic States Banking Market: Swedbanks Experience. Presentation on the conference "Financial sector reforms in Central and Eastern Europe: the impact of foreign banks entry", Tallinn, April 26-27, 2002
28. Scandinavian Models. Economist Survey 20.05.2000.
29. Taylor Nelson Sofres Interactive. Global e-commerce report 2002. <http://www.tnssofres.com/ger2002/index.cfm>
30. Viik, L. Estonian transition into information society. Discussion paper for the UNCTAD Expert Meeting on E-commerce strategies, Geneva 10-12 July 2002. Available http://r0.unctad.org/ecommerce/event_docs/estrategies/viik.pdf