Adoption of Internet services in the Acceding and Candidate Countries, lessons from the Internet banking case

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Abstract

Little is known about the dynamics of adoption of Internet services in general in the Acceding and Candidate Countries (ACCs). Retail Internet banking, however, is one of the most developed e-services and, the drivers and barriers for the adoption of Internet banking are likely to be relevant to other sectors’ e-services. They may also shed light on the underlying supply/demand dynamics.

The paper addresses the following questions:

• What is the current Internet banking level of supply in the current European Union countries (EU15) and in ACCs? What are the drivers and barriers for development?
• What is the current level of adoption by consumers? What are the drivers and barriers for adoption?
• Are there supply/demand issues that are specific to ACCs?
• What are the potential private/public policy options for addressing these issues?

This paper has been based on extensive data analysis, with contributions from Internet banking experts in the EU15 and in the ACCs. Results from this research have been used to develop and validate a model of adoption factors which includes access technology and infrastructure, and sector specific retail banking aspects. This model provides a more detailed understanding of the particular challenges in the ACCs for the development of the services.
Information Society in general, and the adoption of Internet banking in particular. Policy options to address these are also suggested. © 2004 Elsevier Ltd. All rights reserved.

Keywords: Acceding Countries; Candidate Countries; Internet banking; Internet services; Consumer adoption

1. Introduction

Both the supply and adoption of Internet services are key building blocks for the development of the Information Society (IS). Adoption of Internet services in Acceding and Candidate Countries (ACCs) is reported to be low (Gourova et al., 2002), with some exceptions such as Estonia. The lack of publicly available official statistics accentuates the problem of understanding the supply-demand dynamics, drivers and barriers and potential policy options.

Retail Internet banking is one of the most developed Internet services in the current European Union countries (EU15) and ACCs and the analysis of the supply and demand dynamics may reveal drivers and barriers for adoption that could apply to other sectors (e-government, e-administration, e-health). This analysis could also suggest potential policy options for the development of the IS.

Internet banking operations currently represent between 5% and 10% of the total volume of retail banking transactions, both in the United States and in Europe. This is less than the share of Internet securities trading (estimated at between 20% and 25% of the total), but much more than overall business-to-consumer (BC2) e-commerce, which represents less than 2% of total retail trade (UNCTAD, 2002). Being essentially information businesses, banks do not produce physical products and have been trading electronically for decades. For these reasons, hardly any other sector is better suited to e-business.

However, the provision as such of Internet services by the banks does not ensure adoption by users and consequently is not sufficient on its own to achieve the full potential of the IS. In concrete terms, the following research questions are addressed:

- What is the current Internet banking level of supply in EU15 and in ACCs? What are the drivers and barriers for development?
- What is the current level of adoption by consumers? What are the drivers and barriers for adoption?
- Are there supply/demand issues that are specific to ACCs?
- What are the potential private/public policy options for addressing these issues?

2. Methodology

This study has been carried out through desk research and extensive data analysis, complemented with individual questionnaires and interviews with Internet banking experts. An intensive review process has completed the research work.
As an introductory note, it should be mentioned that the general lack of available public and official data on Internet banking services and their adoption by the consumer in the EU15, and particularly in the ACCs, where Internet banking is less developed, has presented methodological limitations. Caution should therefore be exercised when reading the data and comparisons provided.

Nevertheless, the author's compilation of data, from a diversity of mostly non-official 'private' sources (consulting and market research companies such as Data-monitor and Forrester, banks' web sites and press releases), although incomplete and disconnected, provides a first general view of the current situation.

The research work was carried out as follows:

- Analysis of publicly available reports—this allowed the author to draw a picture of the supply side of Internet banking services.
- Review of the limited and fragmented literature available on adoption factors for Internet banking—which led to a hypothetical model of diverse factors affecting the consumer adoption of Internet banking services.
- Analysis of data on Internet infrastructure developments, retail banking, e-banking and Internet banking services, the analysis of specific successful case studies, and, finally, interviews with Internet banking experts—which allowed refinement and validation of the hypothetical model of adoption factors.
- Finally, the validation of the model allowed a discussion and thus furthered understanding of the particular challenges for adoption in the ACCs.

The quality assurance process of this research included an internal peer-review, reviews by Internet banking experts from industry, academic, research and policy making sectors, and review by an ICT expert panel from industry, research and regulatory sectors from the EU15 and ACCs.3

3. The supply side

3.1. Internet banking supply drivers

Drivers for the take up of information and communication technologies by the banks have been many: cost-reduction, mergers and acquisitions, strategic alliances, competition, globalisation, operational risks, cost reduction, time to market, surging volumes, e-commerce, enhancing flexibility, business diversification such as non-financial services and becoming “service aggregators”, etc.

Developments in information collection, storage, processing, transmission and distribution technologies have influenced for a long time, and continue to influence

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2 Nordea Bank Group in Finland, South Korea, and Hansabank in Estonia.
all aspects of banking activity, and have become an integral part of product/service offering, delivery channels and internal management.

Internet banking is one of the many remote distribution channels banks have been deploying for more than 20 years, to complement branch and call centers to interact with their customers, as illustrated in Fig. 1 below. Phone banking, electronic payment debit, credit and electronic purse cards to pay at retail outlets or Points of Sale (POS), cash withdrawal machines and bank kiosk machines making use of Automated Teller Machines (ATM), PC banking, Internet banking, mobile banking, Personal Digital Assistant banking and interactive Digital TV banking are examples of the multitude of channels and technologies used. Of the different delivery channel applications, Internet banking, a content-based secure application based on the open information Internet infrastructure, has the most similarities with other IS services.

Traditionally, the banks made use of bank-owned infrastructures (although these were built on top of wired public telecommunication lines) to deliver ATM, POS and phone banking services. Then PC banking required customers to have a PC, PC skills and a dial-up modem to access a bank server through the phone line. Internet banking, however, requires customers to make use of non-proprietary Internet infrastructure and access, with lower penetration levels than phone lines and lower levels of security. Internet banking also requires a minimum level of user Internet skills. This move to an open environment such as the Internet represents a qualitative step with significant implications for all the actors, including banks, industry and users, and raises new policy issues.

In particular, banks offer Internet banking mainly to increase cost-effectiveness, increase customer reach, and retain market share. Estimates for banking transaction costs across delivery channels, e.g. physical branch, phone, ATM, PC-based dial-up,
show that Internet transactions are the cheapest with a relation of 1–2:100 compared to physical branches, 1–2:30 compared to ATM’s and 1:2–10 compared to PC-based dial-up Internet (BIS, 2001).

The functions provided by banks on the Internet have evolved from simple consultation of account to a full range of banking services. In the most developed applications, one can access on the Internet nearly all services accessible at the branch or by phone. In addition to offering all “branch-based” services, technology allows banks to offer new added value services only available online such as personalised financial information menus, e-mail alerts, electronic commerce, real-time brokerage and third party services (management of electricity bills, tax payment or portals) which increase the benefits and interest of the service. Fig. 2 below shows a possible classification of Internet banking services.

The following are Internet banking trends identified (Datamonitor, 2002; E-business W@tch, 2002; eMarketer, 2002; ePSO, 2002; FIWG, 2002; Goldfinger, 2002):

- Closer integration with traditional banking strategies: the Internet is in the process of becoming the architectural platform of financial services and financial markets. In a few years, there will be no distinction between finance and e-finance, all financial technology from user interface, through middleware, to the core applications and networks will be Internet enabled and Internet based.
- Stronger focus on profitability: return on investment, client acquisition, cross-selling and cost cutting. The global economic downturn has caused banks to cut their investments in Internet banking technology significantly, focusing on integrating
the different delivery channels (to achieve channel, service and brand consistency), and the front and back-office processing systems.

- Consequently, a slow down on investment in next generation technologies such as account aggregation, mobile and iTV banking is expected, as these lack in the short term a strong return on investment case.
- Greater outsourcing of software development and operational services.

3.2. Internet banking supply status

Internet banking is currently offered by most medium and major banks throughout the EU15 (E-business W@tch, 2003). The empirical evidence demonstrates that medium sized banks tend to adopt new ICT technologies in general and Internet banking in particular more quickly than large or small banks, as they have greater flexibility and a propensity to innovate. Small banks which do not have the financial resources to invest in new technologies tend to prefer direct contact with the end users (Corrocher, 2002; E-business W@tch, 2003).

In the ACCs particularly, despite their weaker financial stability and less developed financial services (European Commission, 2002), the vast majority of banks see electronic delivery channels as a must for their industry (ECB, 2002b; see Table 1 for an extract). The banks, which are fighting for an important part of the retail market, see such services as an essential marketing tool.

The analysis of this data indicates that Internet banking is offered by at least the major banks in most of these ACCs. However, the sophistication of services is expected to differ according to country and bank.

Experience shows that, if done correctly, online banking can increase customer satisfaction, boost retention and improve profitability through cost efficiency and increased customer profitability. Analysis of countries where Internet banking is most developed also indicates that Internet banking brings increased competition among banks and new products and services for consumers. Finally, Internet banking could be an enabling instrument for cross-border bank expansion. Initiatives, however, remain limited partly due to the fact that the Internet is often used as a complementary channel to the branch network, which is, by definition, local (ECB, 2002c).

In their analysis of the role of the Internet channel in banking operations, reports (Bank of Korea, 2002; Datamonitor, 2002; Fundación auna, 2002; Swedish Banking Association) suggest that Internet banking is becoming a complementary channel to branch and call centres, and is mostly used for simple transactions. Consequently the Internet is changing the role, organisation and, in some cases, the number of branches, as these will tend to concentrate on advisory and selling functions (ECB, 2002c).

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4 Sweden, UK.
5 Source: Swedish Banking Association and Bank of Valletta, Malta.
6 Also reported in Sweden (Swedish Banking Association), in Finland (ECB, 1999a), in Estonia (Hansabank) and by, Erste Bank.
3.3. Internet banking supply challenges

Customers seem to prefer the “bricks and clicks” model, that is, conventional banks, with an established brand identity, that offer both online services and conventional multi-channel delivery, providing customers with a higher degree of comfort, convenience and security as compared with online-only banks. Physical branches are still the channel most used for purchasing banking products (Christiansen, 2001; E-business W@tch, 2002). This is no surprise if one looks at the types of Internet banking services offered: recent statistics show that only 11.6% of banks in EU15 sold products online in 2002. This limited percentage of banks selling online may be a response to limited consumer demand due to security concerns and therefore banks prefer to sell products through other delivery channels (E-business W@tch, 2003).

Table 1
Status of e-banking development in ACCs, ECB Blue Book 1999 and 2002

<table>
<thead>
<tr>
<th>Country</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>(Blue Book 1999) Some banks offer home banking (or telebanking).</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Banking services are available through Internet and mobile phones.</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Some banks have turned to remote banking for customer payment orders (fixed phone, mobile phone, Internet); one Internet only bank.</td>
</tr>
<tr>
<td>Estonia</td>
<td>In 2001, 66% of credit transfer orders made by individuals were through Internet. In 2000 the major banks developed the Internet-based WAP banking, however, not yet widely used.</td>
</tr>
<tr>
<td>Hungary</td>
<td>Many banks provide services through the Internet, with different levels of quality and content of the services. There are already different mobile banking services in operation.</td>
</tr>
<tr>
<td>Latvia</td>
<td>Over the past few years, most banks have started to offer online services. Banks are increasingly offering home banking, Internet-based and phone-based banking to customers. In 2000 WAP banking applications were launched, and are currently offered by some banks.</td>
</tr>
<tr>
<td>Lithuania</td>
<td>Currently the majority of banks enable customers to manage their accounts and send payment instructions for domestic and cross-border fund transfers using Internet and online PC banking applications. Telephone banking and mobile banking is starting to make inroads on the payment services market. To date, mobile telephones have only been used to receive balance and transaction information.</td>
</tr>
<tr>
<td>Malta</td>
<td>Electronic (Internet/PC) banking is gaining ground as a result of the introduction of web/remote account access by one of the credit institutions, allowing access to account related information and sending payment instructions.</td>
</tr>
<tr>
<td>Romania</td>
<td>In recent years, a large number of e-banking services have been developed. 17 banks currently offer e-banking services, such as PC banking, mobile banking, and Internet banking.</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Home banking, Internet banking and mobile banking are provided by all major banks.</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Almost every bank has introduced Internet banking.</td>
</tr>
</tbody>
</table>

Note: No information has been found for Poland and Turkey. Except when otherwise specified, information is extracted from the Blue Book 2002.

3.3. Internet banking supply challenges
Although the Internet has succeeded in lowering the entry barriers, thus providing space for more competition, the issue of the prevailing business model is still under discussion (ECB, 2002c; ePSO, 2002). In spite of the initial high expectations for Internet banking, experience shows that the cost of introducing the new technologies, risk management, fraud, security measures and acquiring new customers are the main obstacles to achieving profitability in the short and even medium term. Furthermore, Internet banking adds new costs to the multi-channel strategy, as a multitude of increasingly complex distribution channels have to be maintained before critical mass is achieved (E-business W@tch, 2002; ePSO, 2002).

3.4. Conclusions

In spite of the long-term profitability challenges, and, in the ACCs, the weaker financial stability and less developed financial services, most major banks in both the EU15 and ACCs have invested and are still investing in providing Internet banking services as a new cost-effective delivery channel, driven by cost reduction, market share increase and customer retention targets. Datamonitor (2002) estimates that spending on Internet banking technology will increase up to 2005.

Experience shows that Internet banking brings increased cost-efficiency and customer profitability leading to increased competition among banks and new products and services for consumers. In the context of a bank sector that will expand (in ACCs) with expected increased competition, Internet banking could become instrumental in increasing both cost-effectiveness and value to consumers.

4. Findings on the adoption side

4.1. Introduction

There is limited and fragmented available research on the factors that drive Internet banking adoption.

In a statistical analysis 7 on supply–demand dynamics, Bughin (2001) concludes that the degree of Internet penetration as a measure of customer readiness to transact online is an important factor in explaining customer conversion to Internet banking. Indeed, it is not only positive, but also has a more than proportional effect when a country achieves a 30% penetration of quarterly Internet usage. This means that in countries that have already surpassed this threshold, online banking usage will start to increase disproportionately. Similar findings are suggested by OECD research (Christiansen, 2001), which indicates a strong correlation (with logarithmic shape) between Internet penetration and Internet banking, and that countries with an Internet penetration of between 30% and 50% are likely to find themselves in the take-off phase for Internet banking services.

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7 Based on 65 western European banks in 2000.
Concerns about security of prospective consumers are considered to be the most important factors influencing demand (Christiansen, OECD, 2001). Interestingly, a positive consumer attitude to technology has been identified as a factor for Internet and Internet banking adoption (Mattila et al., 2002). This research shows that a positive attitude seems to develop through use, and that consumers who are familiar with the Internet have fewer security concerns. Similarly, favourable public opinion towards the use of technology also influences Internet adoption. In Estonia, this has been stimulated by the positive media attention created by the development of a Public Internet Access Network (Kerem, 2003).

Bughin (2001) also points at bank-specific factors such as bank cost-effectiveness (characteristic of banks which have already established a large electronic channel base, measured by the private ATM density/customers) as having an important leverage effect on customer conversion to Internet banking.

In addition to marketing push by the banks as a positive factor, low quality service at the branches, insufficient numbers of branches or high pricing of branch services have also been proven to stimulate the adoption of Internet banking, as, for example, in Estonia (Kerem, 2003).

Finally, cultural values, such as the importance of direct personal contact when dealing with the bank, have also been reported to play a role in the definition of e-banking culture (ePSO, 2002; Kalkun and Kalvet, 2002).

The above review leads the author to make the hypothesis that a model for factors driving Internet banking adoption would include:

(a) Factors related to the underlying access technology and infrastructure (Internet access and use, trust, security, etc.).
(b) Factors related to the specific sector of the application under analysis, in this case, retail banking including e-banking and Internet banking.

This research has aimed at refining and validating this model in order to understand the potential challenges for development of the IS in ACCs and to identify potential policy options. A holistic techno-socio-economic approach has been taken, so that the most complete view of the dynamics of Internet banking adoption can be achieved.

Nevertheless, more general potential socio-economic factors have been excluded from this model, which are also likely to influence Internet banking adoption, such as, the degree of trust in institutions, the household income level, inflation rates, and the significance of a grey economy. These should also need to be considered for a complete view of the supply/demand dynamics.

4.2. Internet banking adoption, market view

At the moment, Internet banking is moving from being an early adopter application to a digital mass-market application, and it is expected that this trend will continue, although current penetration rates are still limited. Generally speaking, statistics show that online banking trends contradict the prediction that such services
will achieve widespread diffusion rapidly and that traditional banking organisations will disappear. Consumer access and usage is making slow progress in retail banks. Consumers use the Internet as a complementary channel and continue to rely on branches and call centres, which are evolving towards providing more advisory and selling functions. For example, in the most advanced markets such as Finland and Sweden, 60% of online customers carry on making use of branches and call centres (E-business W@tch, 2003).

Consumer motivation to use Internet banking is influenced by a combination of elements such as speed, the convenience of remote access, 24 h a day availability, and price incentives (Mattila et al., 2002). The services most used are those that provide financial information: account information, loan and insurance rates, investment reports and advice. Other heavily used services are simple transactions such as bill payment and money transfer. Finally, the number of users of online trading functions and investment research and advice is lower and is expected to remain limited (Bank of Korea, 2002; Datamonitor, 2002; Fundación auna, 2002).

4.2.1. A world-wide perspective

There is significant country variation in Internet banking penetration levels, and the differences are not clearly related to each country’s level of economic development. In some countries, both industrial and developing, Internet banking is in its infancy. Meanwhile, other countries have seen rapid penetration. Celent’s estimates in Fig. 3 show these disparities. Fig. 3 also shows that the European countries are in the lead, with Norway and Finland having the highest penetration rates—around 40%—among bank customers world-wide, followed by South Korea. Far behind

Fig. 3. Online banking penetration (% customers), Celent November 2002.
come the US and Japan. However, these statistics should be interpreted with care as numbers of “subscribed users” may not necessarily mean “active users”.

4.2.2. The western European perspective

Quantifying the degree of Internet banking development requires that absolute numbers of users, growth, and penetration levels are considered:


2. The Eurobarometer survey (Flash EB No. 112, June 2002) indicates that 29% of EU15 Internet users used e-banking services in November 2001, with significant national differences. Jupiter estimates that, by the end of 2002, 39% of Internet users used Internet banking.

3. In terms of penetration as a percentage of the total population, significant northern–southern country variations are reported both by Forrester Research and Datamonitor. Fig. 4 below shows that the Nordic region, Switzerland, the UK and Benelux are in the lead. Average penetration for the countries considered in Fig. 4 is around 13% of total population. Although not very different from OECD estimates \(^8\) in 2002, these estimates appear somewhat more optimistic.

4.2.3. The Acceding and Candidate Countries’ perspective

In spite of the data availability problems for ACCs, an attempt to give estimates on penetration of Internet banking as percentage of total population for some countries is made in Fig. 5 below.

The below Figures illustrate that, in spite of the fact that most of the major banks offer Internet banking, the average adoption level is very low and far behind EU15 average. As in the EU15, big disparities between countries can also be observed. While in Estonia, 18–25% of the population are already using Internet banking (where Hansabank, with 70% of market share in 2003 reports penetration rates of 37% of bank customers), in Malta, Internet banking services were launched as recently as December 2002.

4.3. Analysis of Internet banking adoption factors

These big disparities in adoption levels between countries, both in EU15 and ACCs, point at a complex range of factors that affect adoption of the Internet banking application.

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The research carried out allowed refinement and validation of the hypothetical model presented in Section 4.1. The results are discussed in the following paragraphs, from two angles:

Fig. 4. European Internet Banking penetration (% total population). Sources: Datamonitor, September 2002; Population: Eurostat (1.1.2002), World Bank for non-EU15 countries. Note: Missing EU15 countries: Austria, Greece, Ireland and Portugal.

(a) access technology and infrastructure, and,
(b) retail banking sector.

4.3.1. Access technology and infrastructure related factors

Internet banking is only one of many applications used by Internet users. The Eurobarometer survey (FEB No. 125, June 2002) indicates that Internet banking is, on average, the sixth application in order of importance of use after e-mail, searches for information on news/topics, travel, training/education and finally health. This indicates that Internet banking is *not a killer application* or sufficient incentive for consumers to acquire the necessary PC and Internet infrastructure and skills to use this application. Consequently, it seems that the pre-existence of *PC and Internet access and literacy*, either at home, at work, at university or at a Public Internet Access Points (PIAP) would be a pre-requisite for Internet banking adoption.

Analysis of Internet banking penetration success stories such as Sweden shows that during the initial stage of Internet development, an important public–private effort was made in order to strongly develop both PC and Internet penetration *at home* and the associated skills. This is considered by SEB bank in Sweden and the Swedish Banking Association to be a key success factor for Internet banking adoption. This complements the findings of Bughin (2001) and Christiansen (2001) on the take-off effect of Internet penetration on Internet banking adoption, when this penetration reaches a critical mass (between 30% and 50%).

The *concerns about security* of prospective Internet banking customers are considered to be the most important factors influencing demand (Christiansen, 2001). Moreover, the overriding factor influencing e-finance in recent years seems to have been clients’ concerns about security and safety. This trend is reported by a number of other surveys in the EU15, in the US (eMarketer, 2002), UK and Italy. Consumer security concerns may be justified, as indicated by the following trends:

- Serious operational risks and potential liabilities are associated with security breaches in the transfer of funds or instructions and the actual theft of identification information over the Internet (Furst and Lang, 2002).
- The 2002 US CSI/FBI Computer Crime and Security Survey reports that 70% of respondents’ sites suffered from vandalism attacks, where 12% included theft of transaction information and 6% financial fraud.
- The 50% increase of Identity theft reported by the US Treasury’s Financial Crimes Enforcement Network in 2001/2000, and experts estimate that this type...
of fraud will triple between 2000 and 2005, with 1.5 million cases expected in the US. 14 Furthermore, bank systems and services are reported to be important targets among fraudsters 15 with 42% of cases related to credit card fraud (26% to new accounts and 10% to existing accounts), 20% to phone or utility bills, 13% to bank fraud, and 7% to loan fraud.

In line with concepts developed by Mattila et al. (2002), who suggested that a positive attitude towards technology develops through use, and that consumers who are familiar with the Internet have fewer security concerns, an evolution over time towards more transactions (vs. log-ons), as services are used can be observed. 16 A possible trend could be that there is an evolution from more consultative functions to more transactional ones as customers acquire maturity in usage, and as increasing numbers of relevant services are available online. This would also indicate an increase in trust over time.

4.3.2. Sector specific retail banking factors

Trust in the banking institutions is expected to be an underlying pre-requisite for the development of financial services. As well as trust in the banks, confidence in the security of the systems, the way private data will be used by the banks and how consumer privacy will be protected, will also play an important role.

Similarly, a strong correlation between the banking culture (referring to which banking services are used and how, and particularly, the percentage of people with a bank account) and the development and adoption of Internet banking services could be expected. The development of a banking culture is influenced by development of the service offer, the legislation and by other factors such as the institutional usage of banking services. Indeed, a high usage by government institutions or enterprises of electronic payment transfers to pay salaries, benefits, pensions, etc, or even utility service providers forcing customers to pay via direct debit on current account, would strongly influence the number of people making use of bank accounts.

The research has revealed the importance of an e-banking culture. E-banking culture relates to the range of e-services offered and the level of consumer usage of electronic channels for interfacing with the bank, or e-habits. 17 In the development of this e-habit, time seems to play an important role. E-service examples are phone banking, electronic payment debit, credit and electronic purse cards to pay at retail outlets or POS, cash withdrawal machines, bank services kiosk machines and PC banking. Observation of countries with strong e-service penetration (Finland, Estonia, South Korea) points at a potential relation between a strong penetration of

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15 Reported by US FTC.
16 For Nordea this relation is on average 1:1 (September 2002), for Hansabank’s customers in Estonia and Latvia this relation is 2:3 and 2:5 respectively (September 2002), and in South Korea it is 1:5 (September 2001). These differences may depend on when the service was introduced: Nordea introduced it in 1996, Hansabank in 1996 in Estonia and in 2000 in Latvia, and South Korea in 1999.
17 Both Nordea and Hansabank report “habit” as an important adoption factor.
electronic delivery channels, and the faster and wider adoption of Internet banking. These observations are in line with the concepts developed by Bughin (2001) which point at bank-specific factors such as the establishment of a large electronic channel base, measured by the private ATM density/customers, as having an important leverage effect on customer conversion to Internet banking.

These findings are complemented by results on the dynamics of Internet diffusion (STAR, 2002), which show that the extent to which users will exploit the Internet’s potential is likely to depend upon existing patterns of usage of traditional media and upon the existing structure of consumption.

Although e-service usage levels strongly depend on bank marketing policies to stimulate the use of electronic channels, cultural values have also been reported as playing an important role in the definition of an e-banking culture (ePSO, 2002; Kalkun and Kalvet, 2002).

Finally, Internet banking push factors are expected to positively influence adoption. They include marketing and communication, service development, service quality, price incentives and the general ‘push’ attitude of banks towards consumers to use Internet banking, such as systematically subscribing all new customers to Internet banking. Service related key success factors identified (ePSO, 2002) are service quality, reliability, availability, speed, usability, multi-channel distribution and the seamless integration of Internet banking services with all the other delivery channels (branch, phone and mobile). These factors are complemented by the findings of Kerem (2003) that show that low quality service at the branches, too few branches or high pricing of branch services have been proven to stimulate the adoption of Internet banking, as, for example, in Estonia.

4.4. Analysis of successful case studies

The analysis of successful cases, such as Finland, Estonia and South Korea, provide more detailed information on the complex picture of Internet banking adoption factors and confirm the relevance of the different factors identified and analyzed above, under Sections 4.3.1 and 4.3.2.

4.4.1. Nordea Bank Group (former Merita) and Finland

Sources: ECB, 1999a; Nordea; Tainio, 2002.

In Finland, Internet banking is third in the list of top applications on the Internet with 65% of Internet users using it, after email and search for news/topical items (Flash Eurobarometer 112, 11/2001). One of Nordea’s highest Internet banking penetration rates is in Finland, reaching around 40% of banking customers and 72% of active customers (September 2002).

The following factors have positively contributed to the strong Internet banking development in Finland:

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18 Usability is an additional barrier for customer uptake. All top 20 European Bank sites flunk on user experience. One million UK users have tried online banking and then given up. Banks are loosing online customers to poor online service design (Forrester, 2002).
Access related factors:

- IT companies may have played an important role in the development of PC penetration, when they paid for a home PC and connection costs for employees needing to work from home, or bought a portable PC for ‘mobile’ employees.
- Internet access from the workplace has been the main reason underlying the rapid growth of the Internet banking service, which has been accessible from the home and the office. Workplace use has meant rapid growth of the service, with users becoming accustomed to using information systems as far back as the mid-1980s.
- Since 1999 Finland has achieved the 30% Internet penetration threshold. Current penetration rates are among the highest in Europe with 51% of users per 100 inhabitants vs. 36% in EU15 in 2002 (Eurostat Pocketbook).

e-Banking culture factors

- Since the 1990s, Finnish banks have encouraged (with price incentives) retail customers to use cheaper remote channels, scaling down their branch network and halving the number of employees in seven years. The introduction of multipurpose ATMs and telephone banking early 1990s has been followed by the introduction of the cheaper Internet banking channel in 1995 (ECB, 1999a).
- Finland is the country in EU15 with least cash in circulation (2.2% of GDP), less than half of EU15 average in 2000, and with a strong tradition in using electronic payment instruments, 37% above EU15 average in 2000 (ECB, 2002b).
- In spite of lower than EU15 average number of ATMs per inhabitant, the Finns are the EU15 top users of ATM cash services, 130% above EU15 average in 2000 (ECB, 2002b).

Following Bughin’s (2001) supply–demand model, it could be assumed that the combination in Finland of both pull (high Internet penetration) and push factors (banks’ cost-efficiency strategies, history of using electronic channels and pricing schemes) creating a strong e-banking culture, have been the drivers for a strong and fast adoption of Internet banking.

4.4.2. Estonia and Hansabank


Hansabank is the biggest bank and market leader in the Baltic Region. It has a 70% share of the Estonian retail market and claims to have 388,000 Internet users (September 2002), representing 37% of bank customers. The following factors have positively influenced Internet banking adoption in Estonia:

Access related factors

- High Internet penetration as a % of population (41% in 2002, Eurostat).
- High Internet penetration at work.
- Investment on PC / Internet literacy (look@world public–private initiative).
e-Banking culture factors

- Above EU15 average usage of cash-less payment instruments in 2000 (ECB, 2002b).

4.4.3. South Korea


In only three years, South Korea has achieved an Internet banking penetration of 24% of the population, ranking third in the world. The major adoption factors contributing to this development have been:

Access related factors

- High rate of Internet users: by July 2002, South Korea had over 25 million Internet users, representing more than 53% of the population (Ministry of Information and Communication).
- Furthermore, South Korea has the highest rate of broadband Internet subscriptions (among all members of OECD) with over 7.8 million houses subscribing to high-speed broadband services.

Retail banking sector specific factors:

- Bank marketing efforts: discounted fees, better deposit rates and lower loan rates.

It could be concluded that, the combination of “push” factors such as intensive and attractive offers by banks and post offices and a history in the availability and use of electronic delivery channels (that is, the existence of an e-habit), together with “pull” factors, such as a strong Internet penetration have created very favourable conditions for adoption.

4.5. Summary of findings

Consumer motivation to use Internet banking is a combination of elements such as speed, the convenience of remote access, 24 h a day availability and price incentives. Experience shows that consumers use the Internet as a complementary channel and continue to rely on branches and call centres. The role of branches and call centres is evolving to more advisory and selling functions.

The European 19 average for Internet banking adoption is estimated at 13% of the total population and 39% of Internet users in 2002 with important northern–southern country variances. The ACCs’ adoption average is very low and far behind that of the EU15, despite the fact that all the major banks offer the services.

The research shows that development of a service by the banks is not sufficient, on its own, to ensure adoption. It refines and validates the hypothetical adoption model

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19 EU15 countries excluding Austria, Greece, Ireland and Portugal.
developed, indicating that adoption is influenced by a complex set of different factors related to access technology and infrastructure and to the specific retail banking sector as described in Table 2 above.

Access infrastructure to the service seems to be a pre-requisite, and access at home may be a relevant factor. Internet penetration is even regarded as having a strong “pull” influence, and the threshold of 30% is identified as a take-off factor. Time and trust are needed to convert consumers to the use of Internet as a new delivery channel and create an e-habit. Security concerns appear as an important barrier for development.

Trust in banking institutions as well as usage of retail financial services appear as underlying pre-requisites for the adoption of Internet banking. The analysis of success stories show that high Internet penetration, together with a developed e-banking culture and a strong push of e-banking in general and Internet banking in particular create favourable conditions for a faster and wider adoption of Internet banking.

5. Discussion: Implications for ACCs

Having refined and validated the different factors that influence the adoption of Internet banking, in this chapter it is discussed what implications these would have, when considered in the context of the ACCs. These discussions are, again, organised under the two headings of (a) access technology and infrastructure, and, (b) retail banking sector.

5.1. Access technology and infrastructure related factors

Considering the importance of Internet penetration for Internet banking adoption, analysis shows that the lack of *PC and Internet penetration* is identified by banks as a barrier for Internet banking development, not only in some EU15 in countries like Spain (ePSO, 2002), but also in ACCs. In the latter, this barrier has a greater impact than in the EU15 as Internet usage in Central and Eastern European countries (CEE) trails behind that of EU15 Member States: at the end of 2002,
a modest 16% of the population compared with 44% for Western Europe as a whole (EITO, 2003).

Furthermore, studies in Lithuania (Povilas, 2001), Bulgaria (ISIS, 2002) and Estonia (Kalkun and Kalvet, 2002) report low PC/Internet penetration at home as a major barrier for the development of the Information Society. Even in Estonia (where in spite of a very low home Internet access penetration of 10%, there is an Internet population penetration rate of 33%) a recent study (Kalkun and Kalvet, 2002) has also identified the lack of Internet penetration at home as a barrier for further Internet and Internet banking adoption.

The analysis of current penetration levels of telecommunication access infrastructure, shows that this situation could be aggravated in the short to medium term by reported fixed line technical limitations and limited and stagnating penetration. This penetration is potentially hindered by the fast and widespread take-up of mobile subscriptions, together with the very low penetration of alternative Internet access technologies, networks and devices (broadband DSL, Cable TV and Fixed Wireless Access) (EEurope+, 2002; EITO, 2002; Eurostat; IDC, 2002).

Furthermore, there seems to be a correlation between the number of PCs in a country and the number of Internet users (EEurope+, 2002). In this sense, ACCs are facing an additional barrier with 5.6 PCs per 100 inhabitants compared to 35 in EU15 in 2000 (Eurostat). Additionally, as there seems to be a strong correlation between Internet penetration rates and cost (EEurope+, 2002), the cost of access services inhibiting market development in the CEE region, will maintain the gap between the CEE region and Western Europe for the next few years (EITO, 2003).

Concerns about security are also reported as major barriers for Internet banking adoption by several banks. In spite of that, it can be observed that banks or bank card operators are acting as identification/authentication gateways in their operating countries and offer, through their portals, access to e-commerce and third party services, such as tax payment, insurance services, electricity bill management, etc. In these cases, banks are acting as trusted parties. This may indicate that banks may have an important role to play in building security and trust on the Internet.

It can be concluded that, as Internet access is a pre-requisite for Internet banking adoption, major adoption barriers reported by different private-public actors in ACCs would be the low PC and Internet penetration in general, and at home particularly, and consumer security concerns.

5.2. Sector specific retail banking factors

The past instability of the banking sector in the ACCs has created a potential lack of confidence in the banking sector and may hinder current and future consumer use of financial services in general (Gourova et al., 2002). This may be aggravated by a post-September 11 scenario where authorities have greater power to control. Resulting privacy concerns could accentuate the lack of institutional trust. Indeed,

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21 Source: Hansabank, Erste Bank, Bank of Valletta (Malta).
22 Erste Bank, Nordea, Hansabank, and BORICA (Bank Card Payment Processor, Bulgaria).
mistrust in ICT based communication/transactions, which can be seen as potential tracing or profiling tools, is reported as a serious potential obstacle to e-commerce (Gourova et al., 2002).

The analysis of the degree of banking service usage, both in EU15 and ACCs, shows there is limited available data. However, there are indications that development of the financial services is still insufficient in most ACCs and limited use of banking products is reported (Gourova et al., 2002). This is confirmed by a comparative analysis of banking usage indicators, such as the number of bank accounts and bank cards with cash withdrawal function (ECB, 2002b). This leads the author to estimate that a lower percentage of the population (at least 50% less) in ACCs have a bank account (except for Cyprus, Malta and Slovenia), which is expected to significantly limit the short-term potential for Internet banking development.

The analysis of the e-banking culture could be carried out through indicative indicators such as the total value of cash in circulation (as a % of GDP), the total use of cashless instruments and the degree of use of ATM’s. The analysis of the ECB data for 2000 in EU15 and ACCs shows a lower average e-banking culture development in ACCs (ECB, 2002b), the exceptions being countries like Estonia, Slovenia and Malta.

This analysis leads the author to the conclusion that, in spite of marketing efforts to promote Internet banking services, there are significant sector-specific barriers for adoption in ACCs. These are mainly related to lower institutional trust in banking actors, as well as privacy concerns, lower development and use of financial services and lower development of e-banking culture (except for Cyprus, Estonia, Slovenia and Malta).

5.3. Conclusions

In view of the above discussion, it can be concluded that the adoption model proposed allows the development of a more in-depth view and detailed understanding of the specific adoption factors that influence the adoption of Internet banking in ACCs. Furthermore, this deeper analysis indicates a number of concrete challenges for the development of the Information Society and Internet banking in the ACCs.

More concretely, as Internet penetration is found to be a pre-requisite for e-services adoption in general, it highlights the criticality of particular barriers for PC and Internet access at home, such as the high cost of Internet access and the limited telecommunication infrastructure for Internet access, such as fixed lines, wireless or cable TV. It also stresses the importance of security concerns as a barrier for development.

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23 Accounts to which payment can be made, and excluding Austria, Luxembourg and Sweden in calculation.
24 Which are normally linked to a current bank account and provide access to the funds available at the account.
Furthermore, the analysis indicates the importance of the retail banking sector specific characteristics for understanding and stimulating consumer demand, as for example the importance of an e-banking culture. It also shows that specific barriers related to the sector itself need also to be addressed in the development of the Information Society, as for example, the lower institutional trust in banking actors, privacy concerns, and lower development and use of financial services.

6. Potential policy options

In the previous chapters, a detailed discussion on the implications for ACCs of the adoption model on Internet banking has raised a number of potential issues for the development of the Information Society in general, and Internet banking in particular. In this chapter are considered a number of policy options that would address the set of barriers identified, in order to stimulate the use of the Internet in general, and the use of Internet banking in particular.

Policy actions in the area of Internet infrastructure and access technology could aim at reducing barriers and stimulating the use of the Internet in general. These would be:

- Government action to stimulate the development of fixed line penetration.
- Private–public co-operation to address the promotion of research, development, standardization and deployment of emerging alternative PC based Internet access technologies such as broadband DSL, Cable TV, Fixed Wireless Access.
- Promotion of a stable legal environment in telecommunications and Internet services that would stimulate competition and could decrease prices for Internet access.
- Private–public co-operation to stimulate demand. This could include the increase of PC and Internet penetration and education at schools at different education levels. It could also include vocational training and other specific training methods for older people and those who have not had Internet education at school or at work.
- Government institutions could increase the use, supply and promotion of electronic services. E-government, e-administration, e-health initiatives could stimulate the use of Internet services by the population, and the development of an e-culture and e-habit.
- Public-private co-operation to develop positive Internet technology attitudes, through general public awareness campaigns.

Sector-specific demand barriers observed in the Internet banking case suggest additional policy options to stimulate the use of Internet-based services:

- Governments could encourage development of Internet services at post offices. Most ACCs have a high number of branches which play a very active role, and provide a variety of services, including financial services.
• In order to increase security and consumer trust, policy options could address elements such as consumer awareness and education, consumer privacy protection, consumer protection in cases of fraud or technical problems (liability limitation) and easily accessible and cheap mechanisms for redressing disputes, as previous research on e-commerce has illustrated (Centeno, 2002).
• The public sector, in co-operation with the private sector, could encourage the development of official statistics on Internet based services.

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References

Fundación auna, Spain, eEspaña 2002.