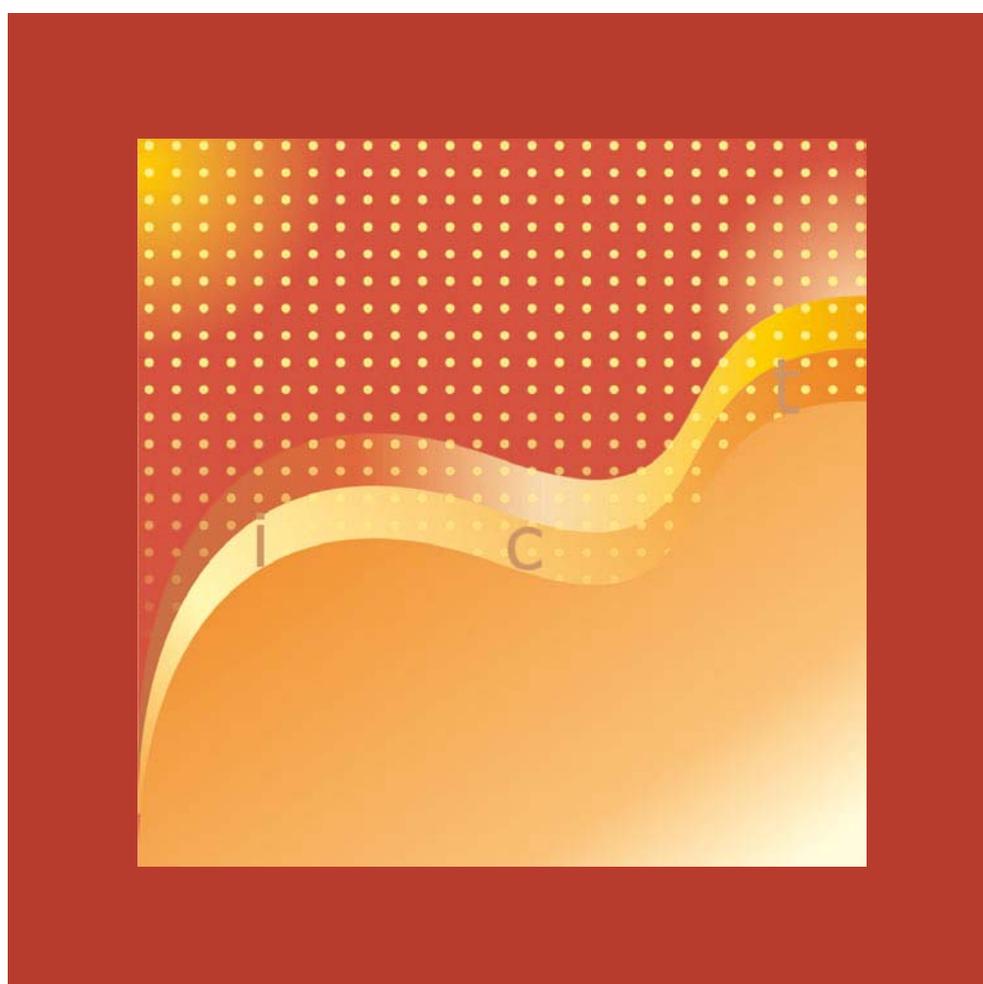


United Nations Conference on Trade and Development

INFORMATION ECONOMY REPORT 2007-2008

Science and technology for development:
the new paradigm of ICT

Prepared by the UNCTAD secretariat



UNITED NATIONS
New York and Geneva, 2007

Chapter 5

E-BANKING AND E-PAYMENTS: IMPLICATIONS FOR DEVELOPING AND TRANSITION ECONOMIES

A. Introduction

In its *E-Commerce and Development Report* (the predecessor of the *Report*) in the years 2000 and 2001 UNCTAD made one of the first attempts to define electronic banking (e-banking) and electronic payments (e-payments) and to assess the future of this new, even for developed countries, stage in the development in finance (UNCTAD, 2000, 2001). By looking at the state of the art in e-banking and e-payments at the time, it tried to understand the prospects for their dissemination worldwide, and especially their implications for international financial flows and financial systems in developing and transition economies. The main focus was on the analysis of the Internet or online banking and payments arrangements created by banks and related entities. Since the beginning of this decade e-banking and e-payments have grown rapidly and become widespread financial services not only in developed economies, but also in many developing and transition economies. The customer base for those services is experiencing double-digit growth, particularly in many dynamically growing developing countries.

Financial service providers, and especially banks, had been using electronic messages for quite some time before the introduction of the Internet. Those messages were transmitted through proprietary software systems, also known as intranets, through modems linked to clients' personal computers or phone lines permitting them to consult accounts and make changes in payment orders in an offline regime. The Internet revolution started the process of replacing those traditional methods of electronic communications by Internet Protocol (IP) based systems. The literature is increasingly focusing attention on this newer and more widespread development of e-banking and e-payments, while continuing to discuss also the role of payment cards, automated teller machines (ATMs), telephone banking and mobile banking (m-banking) or m-payments. The latter can use IP and other communication protocols and are relatively more important in the context of developing countries.

The use of modern information and communication technologies (ICTs), and especially the Internet, by financial services providers greatly increased their communications capacities and speed, decreased the transaction costs of financial operations and permitted the networking of a host of players in various financial schemes. As a result, it brought about major business process innovations. For example, ICTs accommodated the explosion of large-value international payments traffic especially during last two decades, in particular thanks to the introduction of new online payments protocols and real-time gross settlement (RTGS) systems.

E-banking and e-payments, both corporate and retail, proved to be less costly for the commercial banks and at the same time more convenient for businesses, Governments and households. The use of e-finance relies on bank deposits and diminishes the role of cash money (notes and coins). However, it has created another set of security challenges such as the need for protection against emerging cybercrime, which has introduced further innovations allowing more secure methods of e-banking and e-payments.

The intensive use of ICTs also facilitated the transformation of traditional bank-related debt such as various loans and mortgages into securities circulating in capital markets. That increased trading and securitization activities of banks coincided with their relatively reduced role as deposit-taking institutions, characterized by long-term relations with their clientele.

Banks and payment card providers remain at the core of e-banking and e-payments. However, relatively new players such as non-bank money transfer operators, mobile phone operators and e-payment technology vendors are also coming into the picture, trying to carve out niches or special value-added operations from the main players or to conclude various cooperative arrangements with them.

The financial flows between developed and developing countries are also increasingly taking place in the

framework of major online inter-bank transfer systems. While those systems are facilitating the transmission of the main private and public finance flows such as bank credits, foreign direct investment (FDI), portfolio investments and official development assistance (ODA), ICTs are no less important for retail and small-volume financial transfers to households and small businesses in those countries.

The most important small-scale private financial transfers are migrant remittances, which are increasingly relying on online money transfer systems, with a consequent saving of resources for both originators and end-users of those funds. Since remittances have considerably exceeded ODA in their overall volume and are currently the largest non-debt-creating financial flows, the prospects for the moving of this major source of development finance towards electronic channels constitute an important element in analysing the implications of e-finance for developing countries.

Making e-banking and e-payments more affordable to banks and their clients in developing countries (and to less affluent parts of the population in developed countries) is still a major issue. Furthermore, giving to small and medium-sized enterprises (SMEs), micro-enterprises and individuals (part of whom are “unbanked”, i.e. have no bank accounts) better access to simple forms of e-banking and e-payments or m-payments is also becoming an increasingly major challenge, which has started to be addressed very recently.

While acquiring knowledge of modern e-banking and e-payments techniques is still the main hurdle for developing economies, the lack of deeply rooted proprietary systems of finance might become a positive factor and enable countries that are not really attached to traditional systems to leap frog to e-finance. Exploiting that potential will require that the financial sector of developing and transition economies have the capacity to move rapidly towards modern ICT-based systems.

This chapter starts by looking at the main manifestations of financial innovation such as online banking and payments, m-payments and e-money, as well as the impact of ICTs in facilitating securitization of credit instruments and the need to address the security challenges of e-finance operations. It reviews the state of play in Internet banking and e-payments and examines their implications for developing countries. In particular, it discusses the role of ICTs in facilitating

money transfers resulting from migrant remittances, e-banking and e-payments for SMEs and microfinance. Lastly, it tries to assess the future of e-banking and e-payments, particularly in the context of developing countries and countries with economies in transition. In that connection a number of policy and institution-building measures necessary for supporting the development of those services are proposed. Thus, the chapter contributes to the Report, which is putting emphasis on the role of innovations in economic development, by reviewing ICT-generated innovations in banking and payments, as a case study of financial innovations.¹

B. ICTs and innovations in banking and payments

The active use of ICTs during the last two decades further released the forces of globalization, liberalization and technological change. ICTs were particularly driving major innovations in business processes, and especially in financial intermediation.² One of the most innovative industries in terms of using ICTs, the financial sector, increased its share of value added particularly in developed economies. For example, in 2006 its share in the United States GDP exceeded 7 per cent, that is it more than doubled during the last 50 years.³

Another indicator of the so-called financial deepening of the economy is the ratio of financial assets (bank deposits, government debt securities, private debt securities, equity) to the economy. The volume of financial assets currently exceeds gross domestic product (GDP) by a factor of 3 to 4 in the main developed market economies. Financial deepening is also becoming more and more evident in China and other emerging Asian economies (Indonesia, Malaysia, Philippines, Republic of Korea and Thailand), where it represents double the local GDP. The same process is still lagging behind in Latin America (except Chile), Eastern Europe and especially Africa (McKinsey, 2007).

Meanwhile, the use of the Internet as an increasingly important channel of distribution for financial services, and, in particular, e-banking and e-payments, was the most important innovation making it possible to move liquidity and various financial instruments online at much lower transaction costs and higher speed, with a consequent change in the nature of monetary transmission and financial intermediation. The possibility of intensive use of ICTs made it possible

also to improve transparency in financial operations. As a result information asymmetry in financial markets was reduced and they were made more complete. In addition to the migration of traditional banking and payments to the Internet, the use of ICTs facilitated the large-scale introduction of securitized forms of traditionally bank-based debt instruments, thus allowing capital to be allocated at lower cost and with a better risk profile. Active participation in that process by insurance companies, pension funds, private equity funds and hedge funds was also supported by the use of ICTs. Those major changes provided not only new opportunities, but also created challenges, the greatest of which was the problem of ensuring the security of online financial operations. To respond to security threats, financial service providers had also to introduce innovative solutions to protect their clients against inventive cybercriminals.

The manifestations of financial innovation are having an increasingly direct impact on developing countries, which are not overburdened by older technologies and can more easily start their e-banking and e-payments operations in a new environment and with new technologies.

1. From brick to click: emerging e-banking, e-payments and e-money

In the heyday of the Internet revolution expectations regarding the development of e-banking and e-payments were highly optimistic, and not without reason. It was a trial-and-error process, with some models being increasingly marginalized or even destroyed during this major and mainly successful process of creation. Thus, models that did not survive or keep pace with the dynamics of overall trends included the majority of new purely Internet-based banks and e-cash ventures. At the same time, responding to the challenges of Internet-only banks, nearly all major traditional banks introduced their e-banking operations starting, with moving online the inter-bank payments traffic and supporting online the operations of their clients. With time, major banks expanded their e-banking activities, in many cases at the expense of traditional banking ones (known as “brick and mortar”), and created a twin model also known as “click and mortar” or “brick and click”, with the “click” part profoundly innovating and still continuing to transform the banks’ overall business models.

The introduction of new technologies especially in the initial stages, involves major investments and sunk costs

that can be recovered with increasing economy of scale. Research comparing Internet banking experience with the experience of old and newly chartered traditional banks in the United States, during the period 1998-2003 showed that Internet-only banks had a lower return on assets (ROA), a lower return on equity (ROE) and lower net interest margins, and had to offset an inferior accounting performance, higher loan losses and higher borrowed fund costs with higher capital ratios, even in comparison with newly chartered traditional banks. The authors assumed that Internet-only banks can become successful competitors if they are able to improve economies of scale, gain adequate market share and combine new products with traditional banking products (Cyree, Delcours and Dickens, 2005).

The Internet as a financial services delivery channel is acquiring its market share mainly through innovations in traditional banks’ organizational structures. The integration of new Internet technologies also required training and retraining of employees such as account officers, integrating new “front office” remote services into the “back office” services menu, moving towards holistic and standardized IT systems, and making the necessary changes in the process of communications and management (Novametrie, 2004).

E-banking delivery channels for both major and retail clients are based more or less on the same principles of online operations with clients’ accounts, including account consultation, transfers, the use of digitized giros, bills, cheques and other forms of payment, and placing orders for stocks, bonds, derivatives and other securities. At the same time regrouping these and other orders and channelling them between banks generate a huge payments traffic that is handled by major inter-bank payments systems.

The automation of cashless payments and the dramatic reduction in their transmission costs were ICTs’ main contribution in the payments systems. Moving inter-bank payments traffic to the Internet was also a formidable innovation challenge, one which the international banking community has been addressing, particularly during the current decade. That in turn brought about an explosion in the value of payments traffic as a result of financial innovations. Thus, during the last 25 years the value of payments traffic in G10 countries increased 13-fold, and its volume threefold. A more rapid increase in larger value payments, which in many major economies accounted for three quarters of GDP, explains the predominance of those payments over retail payments, with the latter representing only a very small percentage (BIS, 2007). A major innovation

here was the move from deferred net settlements (DNS) systems, whereby the settlements were made by the end of the day, to real-time gross settlement (RTGS) systems. The possibility of settling in the real-time regime was a major step forward in managing systemic risks related to the time needed to clear and settle the inter-bank payments.

In retail e-banking and e-payments there were two main trends in the introduction of innovative solutions: the modification of traditional payments methods such as credit transfers, direct debits, card-based payments and their adaptation to various IP-based applications, and the development of such relatively new instruments as e-money⁴ and other pre-funded payments, cumulative collection or integrated payments, payment portals, and (becoming increasingly important) mobile payments. One of the results of the expansion of e-banking and e-payments was substantially lower costs related to initiation and handling of paper orders. The introduction of various e-payments methods decreased in G10 countries the share of payments by paper-based cheques and credit transfer orders from 60 per cent in 1989 to 20 per cent in 2005 (BIS, 2007).

Given the relatively greater importance of mobile telephony in developing and transition economies, it is important to stress the role of m-banking and m-payments as a major phenomenon in e-payments-related innovations. The possibility of using cell phones and other electronic devices as prepaid payment cards was a major step forward in mainstreaming poor and “unbanked” population into e-payments. In the case of m-payments the central role is mainly played by mobile network operators (MNO), while banks are backstopping them by keeping the consolidated accounts and the float accumulated by those mobile operators.

One of the key functions of e-payments is to support B2B, B2C, P2P and other e-transactions. At the same time e-payments can also service offline business transactions that accept deferred payments.

The introduction of e-banking and e-payments has decreased the tendency of economic agents to keep cash, namely notes and coins issued by Central Banks (CBs), and increased the importance of commercial bank money. Indeed, the value of deposits kept by non-banks in commercial banks in G10 countries increased from 30 to 50 per cent of GDP, while the share of currency remained stable at 7 per cent (BIS, 2007). At the same time, many attempts were made, especially at

the height of the Internet revolution, to replace cash with various types of e-money.

Understanding innovation related to e-banking, e-payments and e-money will be incomplete without looking at how they impact on monetary circulation and transmission. Thanks to the Internet, e-banking and e-payments are increasing the speed and diminishing the costs of financial transactions such as payments, as compared with the similar operations intermediated by other mediums such as cash or traditional bank transfer. Because of the greater speed of transfers, e-banking and e-payments are also increasing the velocity of money and hence decreasing the demand for money in circulation at a given level of economic activities.

While e-banking and e-payments are becoming more important in the operations of financial intermediaries, they also have to cope with the inertia of habits and the preferences of retail and corporate customers while servicing their needs. Those preferences are determined by many economic factors, including the propensity of many households and SMEs to engage in cash transactions in order to preserve the anonymity of their transactions, especially in the context of the informal economy. In such a situation e-money can serve as a medium for a particular part of a transaction requiring an electronic transfer of funds, which then might be again transformed into cash. Also, money might be transferred through a sequence of electronic transfers, part of which are not Internet-based and hence are more expensive. In other words, since they are the most efficient way of effecting payments and other financial operations, the IP-based e-banking and e-payment systems can either replace more traditional and more expensive ones, or coexist with them according to the preferences of monetary circulation participants, including those in the “unbanked” population.

There were also attempts to replace currency (notes and coins in circulation) issued and backed by CBs with electronic carriers of anonymous private e-monies as a means of payment embodied in easily portable and mobile electronic devices. In that connection, it is important to understand that private financial intermediation does not really bring about the creation of e-monies that coexist or even replace public e-money backed by a CB and used by banks in their online transactions. In fact, the Bank for International Settlements (BIS) uses the narrow concept of e-money, describing it as a “stored value or prepaid product in which a record of the funds or value available to the consumer for multipurpose use is stored on an

electronic device in the consumer's possession" (BIS, 2004, p. 2). In other words, it is a transfer of value originated either from fiat money (cash) or from bank accounts into an electronic device embedded in a card, or a purse, or software linked to a PC. Having been transferred it becomes e-money making possible further payments. As those devices are produced by private entities, regulatory issues of ensuring their usability at face value may arise. Also, most of e-money systems are not anonymous – in other words the convenience of having e-money comes at a price (Arnone and Bandeira, 2004). As a result, the volumes of e-money are still very small and this type of innovation is still at a very early stage compared with, for example, Internet banking or m-payments.

The proliferation of parallel trusted systems made it possible to consolidate payments, clear mutual debts of, for example, auction participants and settle the remaining debts at the end of regular periods. In some private exchange systems, private e-monies are usable between participants, but unlike currencies are not legal tender. Such mutual debt-clearing systems should normally reduce the demand for money in circulation. The non-bank electronic billing and clearing systems are acting as consolidators of mutual claims between participants of a given network and are then netting out the residual debts in the system by using cash and bank accounts, in other words generally accepted means of payment.

So far, the expectation that e-money would spell the end of notes and coins has proved to be premature. While some elements of those processes are still at an early stage, e-payments, especially in the retail sector, have continued to be centred on payment cards, which have been increasingly becoming smart cards adapted for the Internet. Meanwhile, the expectation that payment cards would be all the more important by now has also proved to be exaggerated.

To assess the role of e-banking and e-payments in monetary circulation it is important to understand which part of payments and other transfers, intermediated mainly by commercial banks, is passing through the Internet and thus enjoying the low transaction costs and speed of that huge network. In other words such elements of M1 as coins and notes, could become, sight deposits and e-money, that is be easily transformed through online banking and payment channels into their purely electronic forms and then revert to more traditional forms based on the preferences of the beneficiaries of those funds.

The modernization of payments systems that rely to a considerable extent on the availability of low-cost, real-time online communications and networking requires better regulation of payments systems in various countries and its coordination, and closer links between regulators and financial service providers in order to rapidly overcome problems due to possible disruptions and crises in various parts of the system. If those requirements are met, monetary transmission and payments flows will become smoother and more stable.

2. ICTs and securitization of debt instruments

The development of standardized and secure online messaging, and the substantial reduction of transaction costs and information asymmetry related to financial operations, gave a boost to financial innovation in various areas. In particular, that innovation is taking place in the transfer of risks from banks to capital markets through the development of new techniques for securitization of loans. That allows commercial banks to remove a part of the risks from their balance sheets and hence reduce the volume of capital that they have to maintain in order to meet regulatory requirements. The result is a thriving financial derivatives market and an overall increase in the securitization of traditional bank loans and other debt-related instruments.

While ICT-based innovation in finance was one of the drivers of financial globalization and the increase in primarily private international financial flows, it further facilitated the process of liberalization and deregulation in financial services by blurring the frontiers between commercial and investment banking. More commercial parts of global banks started to resort to securitization of their loan portfolio, while investment banks and hedge funds were instrumental in marketing so-called credit default swaps and collateralized debt obligations and other debt-based securities, supporting the development of debt-related derivative instruments. The need to move a part of assets out of balance sheets to meet the stringent capital and asset quality requirements of Basel II has only accelerated that process.⁵

Modern ICTs and, in particular, the Internet facilitated the securitization of traditional bank-related debt instruments and the dispersion of credit risks among non-bank financial institutions such as insurers, private equity and hedge funds. They thus permitted the development and pricing of a host of complex

instruments and 24-hour trading of huge volumes of securities.⁶ The digitization of financial operations and possibilities of creating hybrid products outside the scope of regulated banks triggered the creation of such instruments as collateralized debt obligations, credit derivatives, and structured investment products. In many cases these were managed by specialized companies and funds, special purpose vehicles and monoline insurance companies. While risk dispersion from banks due to financial innovation might be considered a positive trend per se, financial regulators are now concerned as to whether in the event of financial crisis the risk will flow back to the banking system and whether the latter will have enough capital and liquidity to absorb the stress related to such an eventuality.⁷ In that regard overcoming information asymmetry at the level of global financial markets is important for the purpose of adequately assessing the distribution of risks throughout the international financial markets.

It is also thanks to modern ICTs that banks' trading activities related to various debt and other financial instruments became relatively more important than longer-term deposit-taking and credit-providing activities. While analysing the importance of the information revolution for financial innovations, especially in capital markets, is beyond the scope of this chapter and will, it is hoped, be tackled in forthcoming research, it was important to stress here the role of ICTs in facilitating securitized debt instruments, which are increasingly competing with commercial bank-based lending and borrowing operations.

3. E-finance and security challenges of cyberspace

A major challenge for e-banking and e-payments that requires further innovative approaches stems from the need to tame and contain the negative effects of rapidly growing cybercrime. Various actors involved in developing new security systems include technology vendors, security system designers, banks and non-bank financial service providers.

While according to an optimistic scenario about the use of e-banking in the United States the number of users will rise from 56 per cent of households in 2006 to 76 per cent in 2011⁸, other sources are noting a tendency for some groups of customers to reduce or even cease their e-banking and e-payment activities because of security concerns. According to another source, 73 per

cent of users in the 18-50 age group are concerned about identity theft.⁹

The issue of security on the Internet has dominated more of the literature since the definition of e-banking moved from ATMs and telephones to the Internet. Security is all-important with online banking and it might determine its success or failure. In fact, some consumers stop paying bills and conducting other operations online as the (perceived) risk increases.

The security risk can cause banks to lose the gains of Internet banking if problems are not properly addressed. One of the risks is identity theft, which can occur in two ways: "phishing", namely sending authentic-looking-emails, which trick consumers into giving password details by replying to the e-mail; and "spoofing", which uses a fake website that makes customers believe they are using a real site. There are also key logging, software tracking and remembering passwords and numerous other viruses and trojans (Clayton, 2006).

Another worry from the security point of view is the "trust gap", an unproven but suspected divide between those who use the Internet for other tasks and hence trust online banking and those that do not (Fox and Beier, 2006). This means that, to encourage Internet banking, one may first need to encourage other activities on the Internet.

Once the banks start to outsource IT-related operations to other firms, there is the increased risk that the latter may not be sufficiently regulated and that the transfer of information to them and between them and the banks may increase the security risk. Consequently there is a need to develop approaches to make sure that a combination of enough technical expertise, security support and oversight is in place when one is engaging in outsourcing and offshoring in e-finance (Mu, 2003).

The security problem should, however, not be overestimated. Many innovative schemes have been developed to solve the problems (Singh and Malhotra, 2004, Rombel, 2003), with more, including biometrics, in the pipeline (Arumuga, 2006). Furthermore, some authors claim that the slower growth of Internet banking in the United States is not linked to security concerns but to the macroeconomy and market saturation (Rombel, 2005).

While ICTs help to improve credit risk management and hence the situation regarding information asymmetry,

the technology itself can represent a risk and according to the BIS falls into the category of banks' operational risks. From the regulator's perspective, provisions to deal with the eventuality of service disruption for technological, including security, reasons are addressed in the operational risks cluster and are a prerogative of the Basel Committee on Banking Supervision.

Major providers of payments systems such as the Society for Worldwide Interbank Financial Telecommunication (SWIFT), payment card providers such as Visa and Mastercard or peer-to-peer payments service providers such as Paypal are also taking major steps to introduce better-performing security systems so as to protect their clients. For example, Visa and Mastercard have improved security on the web with systems such as Verified by Visa and MasterCard SecureCode (OECD, 2006), while Paypal has made its security procedures more stringent.¹⁰

Banks, other firms, institutions and Governments should adopt a risk management approach to information security (UNCTAD, 2005b). Its particular feature is that it involves an economic assessment of the information assets at risk, which is conducted before possible solutions are looked at. It should clearly outline security risks and compare these with the investment needed to guard against them, all the time considering the value of the underlying information assets. Policy processes at the national or international level may consider possible action to improve incentives for investing in better information security. More practically, in order to use a risk management approach, it is fundamental to define risks, to evolve ways of keeping risk perceptions current, and to measure or develop methodologies to quantify risks. It is immediately apparent that the task in question may be more difficult with regard to information security in financial services. Part of the problem lies with the ever-expanding scope of use of information technology in managing financial operations. Governments and financial industry supervisors and regulators may choose to mainstream certain aspects of financial information security risk measurement and methodologies, including the provision of quantitative data, in order to assist in policy development and implementation, as well as international cooperation on this crucial issue.

C. Recent trends in e-banking and e-payments

As was shown in the previous section, the traditional commercial bank services for corporate and household

customers are undergoing dramatic changes that are moving rapidly towards e-banking. Given the relatively greater importance of commercial banking in the financial sector of developing countries, understanding the current trends in e-banking and e-payments, and deriving lessons from them, could be of the utmost importance for the further modernization of banking in those countries. Consequently there is a need to analyse the current trends and best practices in e-banking and e-payments, bearing in mind their applicability in developing and transition economies.

1. The state of play in Internet banking

E-banking combines informational and transactional facilities. While the risks related to informational websites are limited to incorrect information or negative perceptions of the host bank, the risks with transactional facilities are more considerable. Those facilities should be functional and user-friendly, and customers should be sure that their security and privacy will not be infringed. In a wider perspective, e-banking risks include the following categories: transaction or operations risk, credit risk, funding and investment-related risks, legal and compliance risks, and strategic risk (Ainin, Lim and Wee, 2005). Thus, the use of e-banking poses additional operational and hence reputation risk for existing banks, especially when they become vulnerable to fragile technology, customer confusion and hackers (FFEIC, 2003). Banks that start e-banking may also face initially high costs and technical problems, but those that wait, may lose customers to those who capture the market first. As the experience of many pioneers in e-banking shows, properly tackling the above-mentioned risks from the outset and managing them in the course of the further development of e-banking is important for maximizing the benefits of e-banking in the longer run.

The literature on e-banking mainly discusses the patterns of emerging virtual banks and of established banks diversifying from a purely branch-based approach to a twin online and more streamlined branch system that makes it possible to reduce high staff costs and overheads in a branch (Akinci, Aksoy and Atilgan, 2004). The banks' strategies have also been reflecting consumers' preferences for a mix of delivery channels: the increasingly popular "click and mortar" approach. This model is becoming increasingly the norm in Europe and the United States, since consumers, although increasingly attracted by e-banking, continue to value personal interaction and are concerned about security risks on the Internet (Novametrie, 2004).

It combines face-to-face interaction and other advantages of traditional banking with the 24/7 availability and low, non-distance defined costs associated with Internet banking. Adelaar, Bouwman, and Steinfeld (2004) looked at a Dutch cooperative banking network and found that, since costs are much lower on the Internet, the banks had begun offering the most expensive services exclusively on the web. For other services customers can complete forms online and then finish the transaction in a branch. There is, however a risk that such “click and mortar” models will not be sustainable or will contribute to increasing the digital divide, since while educated and affluent customers will benefit from online services, the poor will lose out as fewer branches will be at their disposal. As a result in the early stages of e-banking there were calls for State protection of traditional banking to protect the poor (Hawkins and Mihaljek, 2001).

It is now common knowledge that transaction costs related to Internet banking operations are much lower than those incurred at a branch or on the telephone. Many sources, including UNCTAD (2001) quoted the famous example showing that a payment operation that costs a branch one dollar could cost one cent if effected via the Internet. With these savings and relatively low set-up costs it is not hard to see the attraction of e-banking (Adelaar, Bouwman, and Steinfeld, 2004); (Dandapani, 2004). Simpson (2002) used data from 1999 for a sample of American banks and banks in emerging markets to assess the different cost profiles and risks in e-banking and in traditional banking. He found that banks in the United States, which have reached an advanced stage in the use of e-banking have lower overhead costs and are considered to have a lower banking risk attached to them when compared with banks in emerging markets, which do not use e-banking. Hence, banking risk and overhead costs could be reduced through greater use of e-banking.

The profitability of Internet-only banks has, however, been questioned, and statistical tests were used to compare it with that of established banks. In one model profit efficiency for Internet-only banks was higher, whereas in another it was lower, suggests that, at least in the short run, Internet-only banks are not necessarily viable and are more likely to be sustainable as one of the channels in a multi-channel banking services delivery model (Cyree, Delcours and Dickens, 2005). In the case of Italy, studies have shown that there is a strong positive link between profitability and Internet banking activities (Hasan, 2002). Internet banks may also have a revenue structure different from that of traditional banks, relying less on interest income

and core deposits than other banks (Furst, Lang, and Nolle, 2002).

Internet banking cannot be forced on consumers, as many of them have the alternative of using their “brick and mortar” banks or telephones, and incentives are therefore needed. The factors influencing consumers to take up online banking vary between countries and depend on national culture, demographics and the structure of the economy (Brown et al., 2004). Li and Worthington (2004) examined data from 15 developed and 12 developing economies and found that the most important factor influencing the use of Internet banking is ownership of a personal computer: the more people in an economy who own a personal computer, the more Internet banking customers there will be. A lesser, but still significant correlation also exists between Internet banking use and the number of Internet hosts.

In developed economies the demand is for quality Internet banking provision, and this is reflected in its supply. For example, in the United States, Wells Fargo has developed a system called “web collaboration” which allows bank staff to see the same screen as the customer sees as they talk on the telephone. Wells Fargo has also introduced the “desktop deposit system” to allow online deposits without the need for extra software, and the “my spending report”, which allows consumers to view simultaneously several accounts on one screen shot (Rombel, 2003). In Switzerland, UBS, which is one of the largest global banks in terms of assets under management, has developed a sophisticated Internet banking menu for all types of customers, which allows them to make a variety of online transfers and payments, consult investment offerings and buy various assets. In parallel, in addition to ATMs, a system of so-called Multimat machines was installed in branches with screens enabling customers to undertake operations similar to Internet banking operations. As a result, the bank’s branches are now staffed more with personnel who are becoming financial advisers who help clients to make more complex financial decisions such as obtaining credit or investing in various financial instruments proposed by the bank. Withdrawing funds or making payments is becoming an automated process. However, the e-banking systems face new problems – for example, clients sometimes have to wait to access to machines of which there are only a few, or customers, who are less knowledgeable about technology have to wait even longer to receive assistance.

In the area of risk management the use of technology means that the market risk incurred by banks (the risk that asset prices will change) can now be better identified and as a result of which a better risk-return trade-off is created. Customers also benefit from the banking system's greater resilience to risks. Banks are also able to evaluate and manage credit risk through the use of various instruments for debt securitization and the development of the derivatives markets (Bernanke, 2006).

2. Wholesale e-payments

According to the Boston Consulting Group's regular global payments report, the volume and value of both domestic and cross-border payments in the Americas, Europe and the Asia-Pacific region will continue to experience dynamic growth. The number of domestic payments is expected to grow from 213 billion operations in 2003 to 414 in 2013, with an increase in value from \$1,731 trillion to \$3,146 trillion, while cross-border payments will display a similar growth pattern rising from nearly 2.5 billion transactions with a value of \$318 trillion to 6.8 billion with a value of \$489 trillion (BCG, 2006, p. 33). Such volumes of payments traffic need to be underpinned by modern inter-bank electronic transmission technologies and techniques, based mainly on IP.

To ensure the fluidity of inter-bank payments, clearing and settlements systems of various levels are put in place, comprising mainly local and regional automated clearing systems that are backed up with larger RTGS systems mainly controlled by CBs. While banks domestically or regionally are interconnected through automated clearing houses (ACHs), at the global level such major inter-bank payment networks as SWIFT, Fedwire (US-centred Federal Reserve system), TARGET (Trans-European Automated Real-time Gross-settlement Express Transfer system) and some other RTGS systems represent the core of cross-border flows of payments. Messaging and transfers between financial institutions intermediated by those and other payment systems have been profoundly transformed by Internet-based technologies. In that respect, it is relevant to provide further information about the ability of CBs and commercial banks to keep up with the rapid technological changes and innovation triggered by the Internet revolution.

SWIFT, the largest global messaging system between banks (including those from developing and transition economies), started in 2002 its move from

a "store and forward protocol" network to a "session initiation protocol" (SIP) network in the framework of SWIFTNet – the advanced IP based messaging solution of SWIFT. This was completed in 2004, and SWIFT is currently working with the Clearing House Payments Company (a leading system for settling and clearing globally United States dollar payments¹¹) to make the two networks interoperable, as the clearing house also upgrades to SIP. The new SIP network allows complete tracking of a transaction throughout the process. It also acts as an "actual private network", ensuring that messages are sent quickly and securely, with the component "FileAct" allowing bulk messages and cheque imaging. SWIFT supplied banks with specific pieces of software to enable them to transfer to the new system and in 2005 began fining banks, that had not yet migrated.¹² Developing countries were slower to switch over because of SWIFT's technical requirements (Hadidi, 2003).

SWIFTNet is used by CBs including those of the United Kingdom, France and the European Central Bank. The Euro Banking Association (EBA) and several ACHs also use it, and it will be at the core of the Single Euro Payments Area (SEPA) when the latter becomes active in 2008. In addition to servicing financial service providers SWIFTNet is also used by major corporations to obtain information for their multiple bank accounts.

In January 2007 SWIFT took another step forward with its business model and launched a new access model called SCORE (Standardized Corporate Environment), which enabled, for the first time, corporations to interact in a standardized way with participating SWIFT financial institutions. Previously corporations could connect to SWIFT only through the MA-CUG (Member Administered Closed User Group) and Treasury Counterparty (TRCO) models, which continue to be available for corporations not eligible for SCORE. This new model is expected to cut down administration costs and simplify the process of standardized messaging as it essentially bypasses the banks when the corporation wants to send a message.

SWIFT's longer-term strategy (SWIFT 2010) is to increase the number of messages it carries and also the type of messages it can carry. The new SIP system allows several different types of messages to be transmitted. SWIFT has evolved to encompass securities with "Wall Street related" messages, which account for almost half of its network traffic. This longer-term strategy is focused on securities and derivatives, once SWIFT

feels it can add value through standardization and hence challenge Euroclear's domination.¹³

3. Retail e-payments

Regarding the retail e-payments, the literature reported *inter alia* the "non event" of the move to new methods e-money (Bounie and Gazé, 2007; OECD, 2006). In developed countries most e-money models have failed while traditional payment methods, including credit transfers, cheques, direct debits and payment cards, have evolved into their electronic forms, this evolution entailing their active migration to the Internet. Nevertheless, credit cards, giro and in some countries cheques are the main methods used in retail payments. New integrated or cumulative payment services such as Paypal and new payment portals for consumers and small businesses have also been introduced (OECD, 2006). Moreover, mobile telephony is increasingly becoming a preferred platform for m-banking and m-payments, which may use payments messaging systems that are in many cases compatible with the Internet.

Online credit transfers and giro, bills and cheque payments are the main Internet-banking services provided to retail customers. Another service that banks provide on a recurrent basis is direct debits, namely payments by banks to various service providers according to the customer's instructions. Standing orders are similar to direct debit operations and are initiated by the payer rather than the bank. Electronic bill presentment and payments (EBPP) services offered by financial and other institutions are also emerging as a major method of making and tracking online payments.

The global payments card market continues to be dominated by a few players, such as Visa, MasterCard, American Express and Diners. The legal decision handed down as the result of the challenge of American Express concerning MasterCards and Visa's practices, especially by setting of high interchange fees, was supposed to lead to increased competition in the market.¹⁴ However, so far, those fees continue to show rise. According to the Nilson Report, a consultancy specializing in consumer payment systems research, the fees that the United States merchants are paying to card companies and their issuing banks have been constantly increasing during the present decade. Thus, the weighted average fee rose from 1.52 per cent in 2000 to 1.88 per cent in 2006, while the volume of fees collected for the same years jumped from \$24 billion to \$56 billion. As a result, the merchants filed

a class action against major card companies. In spite of the increased competition from various debit card networks, automated clearing house networks and systems such as Paypal, it is still the issuing banks that have the bargaining power when deciding which card to issue. As a result, the major part of interchange fees received by payment card companies goes to the issuing banks.¹⁵

The Initial Public Offering (IPO) of Mastercard is not only providing the means to pay the legal charges related to the above process, but is also a part of a change in MasterCard's business strategy to a more open form of business and a new corporate governance structure intended to meet competition in the credit card market. After the IPO it changed its official name to "MasterCard Worldwide" and now has a three-tiered business model as a franchiser, processor and adviser.¹⁶ American Express and Discover take a more segmented approach, looking at the upper and lower ends of the market respectively (Simpson, 2005). These three players are all public companies (Discover is a part of Morgan Stanley), while Visa like SWIFT is still a cooperative of banks servicing over 20,000 financial institutions. At the end of 2006, Visa, the largest global payments card company, announced restructuring whereby Visa Canada, Visa USA and Visa International would be merged to create a global public corporation called Visa Inc., the eventual goal being to launch IPOs. Meantime Visa Europe will probably continue to remain a membership organization. In consequence, Visa expected to accelerate product development and innovation.¹⁷

Although they are convenient means of payment, credit cards continue to be expensive not only for merchants but also for those cardholders that use them as a short-term consumer credit instrument. The interest on credit card overdraft is at least 15 per cent per annum including in countries where interest rates, mortgage rates included, are much lower. In spite of the unsecured nature of card-related debt, such a large difference is not justified, especially in view of the new possibilities arising from current small borrowers' credit-scoring techniques. In fact, one of the reasons for mortgage-related debt increase in the United States, and one of the underlying causes of its current crisis, is the massive refinancing by US households of their consumer debts (i.e. mainly credit-card-related debts) through incremental borrowing on the mortgage side using the collateral of the house.

To counter this lock-in effect of credit card market oligopoly, competing debit card systems, frequently

initiated by major retailers, are emerging and new card issuers are entering the market. However, they are far from being the leaders in acquiring a critical mass of clients, and hence convincing the banks to issue the cards on their behalf. Moreover, the major credit card companies and major issuers are also entering into ventures of presenting major retailers, and in such cases they agree not to charge annual fees and considerably reduce the interest rates charged in the case of overdraft.

Despite the problems outlined above, the convenience of electronic payments proved to be a stronger argument for consumers, and in the United States for example, in 2003 the number of electronic transactions (card and direct debit transactions) totalled 44.5 billion, and overtook for the first time the number of cheques paid, which stood at 36.7 billion.¹⁸

Lastly, mobile handsets are increasingly becoming a means of payments for their owners – either through their use as a credit card, with the customer being billed by a mobile operator at the end of the month, or as a prepaid card. Prepaid phones, by definition, use the latter form of m-payment. The active involvement of mobile network operators in such payments has created some legal uncertainty as far as their role in the financial sector is concerned, and regulators are trying to address this question without impeding innovation in that sector. In fact, competition from non-banks in payments services is exactly what

European Commission is going to encourage in its new payment-services directive, which will come into force in 2009.²⁰

D. E-banking and e-payments for development

1. E-banking and e-payments in developing and transition economies

Since banks in developing countries and in countries with economies in transition did not have an abundance of traditional proprietary technologies and hence less attached to particular banking techniques, they were also in many cases more open to introducing the most recent Internet-based technologies. The fact that they were less burdened with tradition in some cases made it possible to introduce new technologies more rapidly, and also adapt to them more rapidly. However, that requires more vigorous training and retraining of employees. This is why it is important to understand how the financial institutions in those countries were managing to strike a balance between the opportunity to be more innovative and the challenge to service a population with a lower per capita income and large share of the “unbanked”. In particular, it is interesting to identify how using ICTs and providing e-banking and e-payment services could improve the access to finance of SMEs and microenterprises, which

Box 5.1

Alternative payments systems¹⁹

The largest alternative Internet payment provider with a strong position in the Internet auction market is PayPal (which belongs to e-Bay). Customers hold accounts with PayPal and send by e-mail payment or withdrawal-related instructions. They fund those accounts either directly from their bank account through ACH transfer or by using cards or cheque deposits (BIS, 2004). PayPal has doubled the number of its accounts in just two years and has now over 143 million accounts in 190 countries (of which 35 million are in Europe). PayPal is no longer just in the business-to-consumer market. Beginning in mid-2004, it began directly offering its services to small businesses as a conduit for business-to-business transactions that do not involve an e-Bay purchase. In fact, nearly 40 per cent of its traffic is not related to E-Bay. However, most e-commerce sites do not suggest PayPal as a payment agent. Fund transfers via web telephony such as Skype and mobile phones are also fields that the company is exploring. PayPal is neutral in its banking arrangements; it is not aligned with a specific bank or consortia of other payment service providers.

Other potentially emerging players in this field include Google and Yahoo. For example, Google's Checkout uses its powerful advertising engine to encourage businesses advertising in Google to also use the services of Checkout. Microsoft is also planning to launch an online micro-payments service.

To create trust and build confidence in third-party service providers, especially aggregators, CBs need to monitor them further and provide clear guidelines and regulatory framework for such services.

represent the core of those economies. This underlines the importance of further research into the use of e-banking and e-payments in SME finance, as well as in microfinance.

There are a number of features that the customer values in a financial service. These include acceptability, accessibility, affordability and ease of use. As far as businesses are concerned they look for a number of other features, ones that will help ensure that they provide a cost-effective service. They include functionality, segmentation (the ability to sell different products to different groups of customers), competitive fees and charges, increasing efficiency, controlled development costs, distribution among the population and partnerships with other companies. Financial literacy is important for increasing e-banking among the poor, and there are a number international programmes, for example set up by the World Bank, to increase this literacy (Hadidi, 2003).

Much of the literature on e-banking focuses on case studies and comparisons in developed countries, where it is well established and in some cases is not far from the point close to saturation. However, e-banking is also increasingly taking root in many developing and transition economies, and in some of them its penetration exceeds OECD median indicators.

For example, Internet banking has been surprisingly successful in Estonia. The first bank to introduce Internet banking was Hansabank in 1993. There are several reasons for this success. First, since the country had previously had a command economy, the traditional commercial banking did not exist, and hence consumers did not have time to grow attached to the branch model used for many years in other countries. As a result, consumers did not value or expect much from the bank branch experience. Second, banks were still developing and did not have full country coverage. They lowered their costs and improved their image. The success of Internet banks has been largely due to their wide appeal and the Internet technology available for reaching sparsely populated areas; that availability has been due in turn to government policies to deregulate, increase competition in the telecom markets and increase Internet use (Kerem, 2003). In fact Estonia was ranked quite high – ahead of some OECD countries – in the Networked Readiness Index of the World Economic Forum and the E-Readiness Ranking of the Economist Intelligence Unit.²¹

Internet banking has grown rapidly in Brazil and has been the fastest-growing banking medium (Diniz,

Porto and Adachi, 2005). In Turkey e-commerce is also most developed in the banking sector and driven by reduced costs, transaction costs on the Internet being only 5 per cent of those at a branch. The first bank to use the Internet in Turkey was Isbank in 1997 (Akinci, Aksoy and Atilgan, 2004).

The Nigerian Inter-Bank Settlement System (NIBSS) has recently developed the Electronic Fund Transfer Service, which focuses on giro and ACH functionalities. NIBSS is collectively owned by Nigerian banks and is responsible for transactions including final settlement with the Central Bank. Launching ACH and adopting the electronic cheque presentment with image exchange system have shortened the clearing cycle still further, as well as reducing fraud and cutting costs.²² Despite great ambitions for Internet banking in Nigeria, these were thwarted by technical problems. This was particularly the case with the national telecommunication network, when banks have been led to seek alternatives to it, but in an uncoordinated and hence costly manner. Nevertheless, consumer perception of the effect of IT on the banking industry stayed positive (Idowu, Alu and Adagunodo, 2002).

Thanks to the policies of the Central Bank and the well-developed business sectors, South Africa is particularly well suited to electronic banking, which includes ATMs and other features. Those features make them attractive to poorer customers (Cracknell, 2004). However, there is also the psychological barrier, especially among the poorest (Hadidi, 2003). Singh and Malhotra (2004) conducted a survey to determine why some South African customers are reluctant to bank online. They found that the more affluent and younger are the groups that are most frequently banking online. For those groups that did not bank online, the main reasons for not doing so were fears about security and lack of knowledge. At the end of 2003 online bank accounts in South Africa topped the million mark for the first time, amid claims that the media had grossly exaggerated security fears but been mainly ignored by the public.²³

The Reserve Bank of India (which is the Central Bank) has been heavily involved in the development of e-banking and has drawn up guidelines for banks to follow when providing Internet banking services. The development of Internet banking in India began with the foreign and private banks, with the public banks lagging behind (Singh and Malhotra, 2004).

In Romania foreign banks also led the way in electronic banking, beginning in 1996, and local banks

followed later; however, usage rates have remained low (Octavian and Daniela, 2006). Banks need the approval of the Ministry for Information Technology and Communication before they can offer Internet banking services. There are currently 28 banks offering such services. Most of the approved banks use VeriSign to guarantee their sites and also employ methods such as Digipass Pack to identify users and secure transactions.²⁴

Siriluck and Speece (2005) suggest that Asian cultures attach greater importance to interpersonal contacts and relations than those in the West, and as a result Internet banking faces an extra hurdle. Malaysia is especially interesting for Internet banking because of the high level of technical education and the quality of the technology available (Goi, 2005). In a survey of over 500 people in that country the use of online banking was seen to be concentrated around younger and higher-income groups. The quality of online banking websites was high, although not all banks provided all services and options via their websites. Most Internet customers had a positive perception of Internet banking; however, there were also security concerns (Ainin, Lim and Wee, 2005). Foreign banks were allowed to provide banking over the Internet as from January 2001 (a year after domestic banks). But this delay did not protect domestic banks from foreign competition, even though foreign banks offered less technologically sophisticated services (Yeap and Cheah, 2005). Regulation took the form of the Central Bank's minimum guidelines on the provision of Internet banking issued in 2000, which require banks to meet with customers face to face before an Internet account can be opened or credit given (Goi, 2005). The Central Bank of Malaysia has developed research collaboration between Asian CBs and the BIS on technology issues, and has also established minimum guidelines and standards for risk management as well as monitoring of compliance and risks.

Electronic cards are becoming one of the channels for e-payments in countries with a low level of banked population. Figure 1 shows transaction flows related to regional payment cards project of the West African Central Bank (WACB) created within the framework of the Economic and Monetary Union of West Africa. The common currency in the Union helps banks in the region to avoid foreign exchange risk in their mutual transactions and has enabled WACB to develop a card-based payment system called "Monétique UEMOA" (in addition to other two regional RTGS and ACH systems). The system has an inter-bank card payments processing centre (CTMI in French; see chart 5.1)

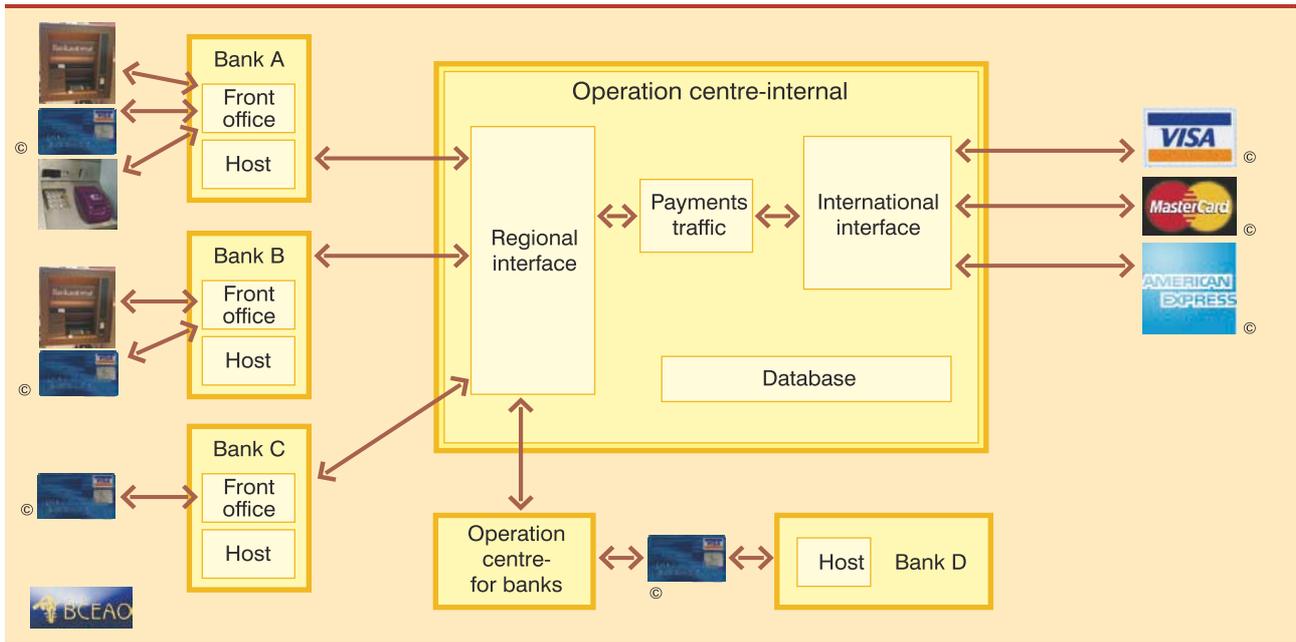
that allows 63 commercial banks in the region to issue payment cards for corporate and individual users.

The phenomenal growth of mobile telephony in developing countries has also brought about a dynamic expansion of so-called m-banking and m-payments.²⁵ They are becoming very popular in small purchases through m-commerce as well as in P2P transfers such as remittances, or in B2B payments, especially in microfinance (see following sections). Since most mobile phone owners in developing countries are "unbanked", they participate in e-payments by buying prepaid cards at various points of sale and then make their m-payments. Given the relatively high level of mobiles' penetration in developing countries, they can become the main channel for delivering online payments, especially in countries and regions with few branches and ATM networks. Chart 5.2 shows the relationship between mobile phones, ATMs and bank branches in Thailand and South Africa is similar to that of the United Kingdom, although the penetration is still at a relatively lower level. At the same time, in the case of China, Kazakhstan and Egypt and to a greater extent other African countries, the penetration of mobile handsets is far ahead of that of bank branches and ATMs.

A mobile payment scheme called M-PESA is being successfully run in Kenya by Vodafone, local Safaricom with the support of the United Kingdom Department for International Development. Around 150,000 M-PESA customers with the help of around 500 agents, can make payments or send money using their mobile phones. The customers' phones are charged with prepaid funds in Safaricom shops, petrol stations and other points of sale as soon as the owners of the mobile phones, whose identities are verified via their mobile numbers, pay the cash. M-PESA has developed its own financial system, including clearing and settlement, and keeps the float in a single account in the Commercial Bank of Nairobi. As long as it does not pay interest or invest this money, the Central Bank of Kenya tolerates such financial activities.²⁶

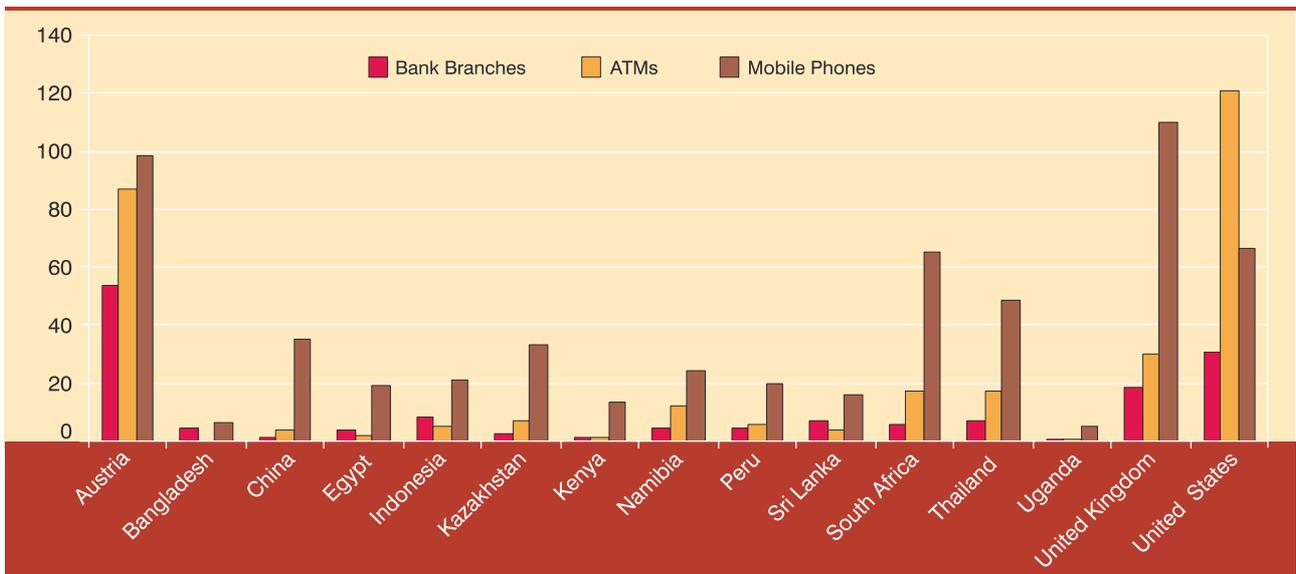
The following sections will focus on three important aspects (from the development perspectives) of financing destined to less endowed groups of population and enterprises and namely remittances as well as e-finance for SMEs and microenterprises. The introduction of digital delivery channels in those areas is providing new opportunities to combat poverty by improving access to finance through the better use of new more accessible for those groups tools of ICTs.

Chart 5.1
Architecture of the CTMI-UEMOA



Source: A Altine, Opportunities and challenges of e-finance in the UEMOA subregion, West African Central Bank, 2006 (see www.uneca.org/e-trade/).

Chart 5.2
Penetration of bank branches and mobile phones*



Sources: Beck, Demiurg-Kunt and Martinez Peris (2005); ITU (2007)
*Bank branches and ATMs per 100,000 people; mobile phones per 100 people.

2. ICTs and remittances

Remittances, representing mainly small-scale transfers by migrants, expatriates and to a lesser extent charities, are becoming an increasingly important source of external financing for many developing and transition economies and as such merit careful examination. As a distinct item of balance-of-payments (BOP) financing their volumes in the case of many recipient countries are comparable to other sources of foreign exchange such as exports, foreign private capital inflows and official aid. However, unlike others, those flows, also known as unrequited or unilateral transfers (i.e. not incurring debt-related obligations), are a result neither of earnings by country residents due to exports of goods and services, nor of their borrowing or investment-attracting activities.

According to the World Bank, remittances sent by migrants to developing countries reached \$206 billion in 2006 (World Bank, 2007, p. 54). However, it is estimated that the real level of current remittances could be 50 per cent higher owing to the major role of various informal remittances networks (Coyle, 2007). In other words, the overall volume of all remittances might come close to that of FDI. According to UNCTAD, FDI flows to developing economies totalled \$379 billion (UNCTAD, 2007).

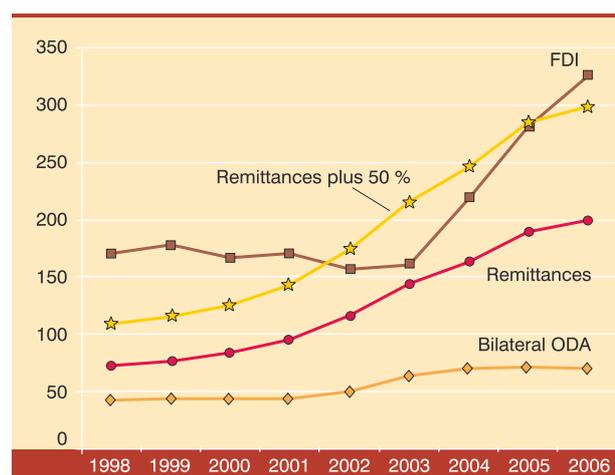
Compared with other types of financial flows, remittances are the least cyclical source of BOP financing. They play a stabilizing and even countervailing role when countries, in adverse economic circumstances, suffer from reductions in flows of external finance coming from other sources and especially from short-term portfolio capital. That positive effect is due to the

underlying motivation behind those transfers, which is primarily to support families back home. Remittances allow the consumption level of the poor to be sustained, giving them better access to basic facilities, including health and education facilities, in recipient countries. Remittances also help to launch and sustain small family businesses.

Historically the main part of those funds was transferred through informal systems such as *hawala*. *Hawala* is a form of informal networking whereby *hawala* brokers intermediate transfers without actually moving funds. They work on the basis of trust with minimal documentation, and each tries to have enough funds to meet the demand of correspondent brokers (Fugfugosh, 2006). As in the case of credits, informal

Chart 5.3

Financial flows to developing countries (\$ billion)



Source: World Bank (2007)

Box 5.2

Defining remittances in the balance of payments

In 2008 the new IMF BOP Manual is expected to take into consideration recommendations by the United Nations Technical Subgroup on the Movement of Natural Persons and replace the term «worker remittances» by three separate terms:

- Personal transfers (PTs), which are transfers in cash or in kind received or made by resident households from or to non-resident households. Sources of income, relationship and purpose of transfer are not taken into account.
- Personal remittances (PRs), which are the sum of PTs, net compensation of employees and capital transfers – that is, they involve all household-to-household transfers and take the perspective of the recipient country.
- Total remittances (TRs), which are the sum of PRs and social benefits paid to households from other institutional sectors. They also take the perspective of the recipient country.

Source: Migrant remittances to regions neighbouring the EU. ECB Monthly Bulletin, February 2007, pp. 91–92.

intermediaries were charging the remitters passing through their channels high fees. At the same time, the fees collected by major formal money transfer service providers were also initially quite high, considerably exceeding, for example, the level of interchange fees paid by merchants for credit-card processing. However, with the advent of the Internet and further dissemination of electronic means of payments, various money transfer service providers started to carve large chunks of payments out of the cash-based systems. Competition, and in particular the use of the Internet, made it possible to considerably reduce fees charged by such major operators as Western Union and Moneygram. The competitors from regions within the main corridors of remittances were quite creative in using various delivery channels, including Internet-based networks or m-payments, and hence considerably cut their costs of operations. They were also less strict than major Western operators in their perceptions of risks, given the extremely short periods of time needed to complete the e-remittance operations.

As the example for 2004 in table 5.1 shows, regional systems such as Anelik and Unistream were charging much less for transfers from the Russian Federation to Armenia than was the case for Western Union. That competition has paid off and while for the same corridor Anelik is still charging around 3 per cent for the transfer of, for example, \$200, Western Union cut its fee to around 5 per cent, which is much less than in 2004.

In countries with large migrant populations banks are trying to attract migrants as bank clients and are using remittances as a tool to attract more deposits from them. For example Chase has introduced a scheme for

the free transfer of money to Mexico, enabling cheque-account customers to make a limited free transfer of funds (up to \$1,500 per month) to its partner bank Banorte, which has 1,000 branches and 2,800 ATMs in Mexico. The recipients of those funds can either keep them in accounts in Banorte or collect cash without paying a fee. According to the Central Bank of Mexico, remittances from the United States totalled \$23 billion in 2006 and are expected to reach \$24.5 billion in 2007.²⁷

A relatively new phenomenon is the use of mobile phones as a means of transferring money between countries or within developing countries from urban to rural areas. Sometimes those areas may even lack bank branches, and the only way to cash the transfer may be to use the specialized points of sale that also sell prepaid cards.

3. E-banking and e-payments for SMEs

To access finance, SMEs have to compete with households and large corporate businesses in order to gain a share of the financing disbursed by banks. Traditionally, banks were biased against SMEs given the relatively higher costs of acquiring and processing transactions for SMEs in the light of a wide geographical spread and the greater number of low-volume transactions. That resulted in high unit transaction costs related to SMEs' financing. Modern e-banking with online credit risk databases and much lower transaction costs related to data processing and data mining is providing new opportunities for improving SMEs access to, in particular, short-term working capital and trade finance through e-banking and other e-trade finance services. It is becoming possible for SMEs to manage their own accounts and payments traffic online, while banks can not only provide finance, but also help them manage their cash flow and ensure a quicker turnaround of working capital.

For financial institutions, servicing this sector requires the finding of solutions that take into account the specific risk-return perspective of the sector. For the most part, the challenges to SME funding result from lack of information, such as unclear financials, and the fact that information about SME borrowers is being limited. There is also a lack of comparative data on SMEs. Banks in most developing countries do not have access to transaction data and credit history (unlike in many developed countries) through credit bureaux and other credit management service providers

Table 5.1

The cost of transferring \$50 and \$200 to Armenia in 2004

	Cost as %	
	\$50	\$200
Anelik	1.5–3.0	1.5–3.0
HSBC	70.9	18.5
Unibank (Unistream)	1.0	1.0
Western Union	26.0	11.0

Source: Roberts & Banaian (2005).

such as credit insurers and factors. Developing such services primarily through the appropriate use of ICTs – offering financing and credit management through open networks such as the Internet – could overcome impediments related to SME financing.

E-banking benefits are especially apparent to banks when doing business with SMEs. SME business was labour-intensive and offered relatively low profits for banks, whereas SMEs were finding the service provided by banks too “one size fits all”, inefficient and supply-driven. E-banking and other e-finance techniques might address those problems through automated, 24-hour procedures and lower costs. SMEs can then use their new efficiency and access to credit at lower rates to fuel growth in developing countries (Mu, 2003). However, as Wendel (2006) and others emphasize this debate is not much different from the debate related to retail banking. The role of the traditional branch, especially when dealing with SMEs suggest that the “click and mortar” approach will continue.

In addition, the reduction in costs associated with the possibility of having better-organized information flows, greater transparency and hence a better loan-tracking process can be considered to be positive externalities of ICT adoption in SME financing. The new e-financial tools that are designed for SMEs and their needs are supposed to help in gaining those advantages. Even though the development of those systems is not very time-consuming, its finalization requires quite a long time, and the systems cannot start to be remunerative until their integration process has been completely finished.

Investments in this field cannot be remunerative unless they are associated with a change in business process (Firpo, 2006) and improvements in skills at different levels. As a consequence, ICT use can be considered a new approach for both human capital and the organization of SMEs, and the means to achieve better financial results. Local requirements are certainly one of the most important issues for the success of this technology in developing countries. Delivery channels and product mix are two important aspects for the success of each company. However, the high costs of the comprehensive adoption of ICTs often imply the need for public financial support or various forms of public-private partnerships with development and export-import banks and other supporting institutions.

In order to create a public record of past payments SMEs in developing countries need to move out of

informal economy. By fully formalizing themselves SMEs might create for themselves a public reputation as of good-quality borrowers. Under such circumstances financial institutions can create electronic credit histories and Internet-based credit risk databases in helping creditors to provide capital with fewer and less stringent requirements. A responsible behaviour by firms can lead banks to trust SMEs more, requiring fewer guarantees for loans and creating conducive borrowing environment. As a consequence, such a change in SMEs way of operating can have important effects for the whole banking sector. Indeed, there is a need for a larger formal economy, characterized by a business-friendly regulatory and institutional environment, including a more competitive banking sector that will provide credits to SMEs with less onerous collateral requirements and with lower interest rates. A larger formal market, including the majority of SMEs, would also attract other financial service providers that will contribute to credit risk management and financing; this will lead to more competition in the financial sector.

The lending infrastructure plays a very important role in the efficiency of ICT use. Indeed, the introduction of internationally acceptable accounting and payment performance information of a good standard are fundamental for credible financial statements and are a precondition for the feasibility of loan contracts. Also, the legal and institutional infrastructure strongly influences the adoption of ICT necessary for backing up e-finance for SMEs. Commercial codes, property rights and bankruptcy laws affect the degree of confidence in financial contracts. Moreover, even tax and regulatory environments can alter SME credit availability in a negative way. In some cases, regulatory restrictions on the entry of foreign banks into the domestic market and other restrictions on foreign banks' operations may negatively affect SMEs' access to credit. As a consequence, the availability of credit for SMEs depends on the quality of regulatory and institutional environment in general and lending institutions in particular.

The structure of financial institutions impacts on SME lending and can lead to different treatment for SMEs operating in similar markets. Large institutions can run economies of scale and offer competitive interest rates, even though they often analyse firms only from the financial ratios perspective. However, large institutions certainly have more agency problems than smaller ones characterized by fewer internal hierarchical separations. As a consequence, the latter can manage soft information more easily than larger

institutions. In developing countries it seems consistent for foreign-owned institutions to have more problems than domestic ones in managing soft information. Nevertheless, a combination of better technology, easier capital market access, greater capacity to diversify portfolios and better working skills can make foreign-owned banks more efficient. Also State-owned banks in developing countries, in order to succeed in financing SMEs, need to pay more attention to modernizing their delivery channels through better use of ICTs. The use of various modern ICT-intensive delivery channels and more competition might attract new lenders in the SME finance market and result in better access for SMEs to e-banking and other e-finance facilities.

4. Microfinance

Microfinance, by definition, constitutes credit and other financial services of a low monetary value given to microenterprises and households primarily to encourage their productive activities as a means overcoming the poverty trap. In addition, the aim of microfinance institutions (MFIs) is to reach out to the poor, who have been left outside the traditional mainstream financial services. This implies that a very high volume of small transactions is a defining characteristic of MFI operations.

As in the case of SMEs, the main reasons why commercial banks do not regard the population that microfinance targets as worthwhile customers is

the fact that serving this population involves a high volume of low-valued transactions. Traditionally high transaction costs and other market failures were a barrier to supplying small-scale credits, even though the interest rates charged could be relatively high. However, the cost of formal microfinance credits are still normally much lower than the usurious terms charged by informal creditors, especially in rural areas (see chart 5.4). In fact, the main target populations for microfinance are peasants, and tapping into that market is a strategic goal for microfinance (Ferro, Luzzi and Weber, 2006).

One of the reasons for the cost of microfinance that is acceptable to borrowers is the fact that many MFIs receive funds from NGOs or donor agencies. However, that is starting to change. While many are still donor- or public-investor-dependent, others are becoming more market-oriented, profitable and (it is to be hoped) sustainable. The proliferation of various types of MFIs is bringing about a rapid increase in their numbers in developing countries. Indeed, as chart 5.5 shows, such early adopters of MFI as Bangladesh and other countries in South and South-East Asia are leading in terms of penetration.

One of the key factors distinguishing top-level MFIs from their peers is the adoption of technology. In fact, some MFIs are becoming quite sophisticated in their use of ICTs (Ivatury, 2004). The obvious benefit that the MFI industry derives from ICTs is the reduction in costs terms of the MFIs' back-office operations

Box 5.3

Using ICTs in some key SME financing channels

E-trade finance based on financial statements and payments record. Some specialized financial service providers provide short-term working capital and trade finance on the basis of combining dynamic analysis of a given SME borrower's cash flow with its financial statements and ratios. As SME receivables are the primary source of repayment, obtaining online information on the borrower's flows of receivables and payables makes it possible to ensure that there are no abnormal fluctuations threatening debt repayment. It also makes it possible to send early warning signals to the borrower in such cases. Moving all that information online and using models to trace abnormalities in cash flow, permit banks to automate the process and to continue financing the successful SMEs.

E-credit information and SME credit scoring. To obtain further financing it is in the interest of SMEs to provide information enabling credit histories to be compiled and thus showing their capacity to repay loans on time. E-credit information also includes information-gathering from independent sources. As a result SMEs receive credit scoring or rating based on credit history databases and on that basis obtain better access to credit.

E-credit insurance and e-factoring. These are the channels adapted to SMEs' needs, protecting suppliers' receivables and making it possible to provide supplier credit to buyers. To provide credit protection through credit insurance or to discount accounts receivables, service providers need to have large credit risk databases composed mainly of SMEs, and a knowledge of buyer's country political risk. All those information and transaction tools are currently available online.

and of delivering their services, which should mean lower fees for MFI's customers. However, there are additional benefits derived from the introduction of ICTs, such as easier tracking of loans and repayments, standardized processes and better flows of information in organizations, and more transparency. Also, MFIs may be able to offer additional features and services that would not have been possible without the adoption of ICTs.

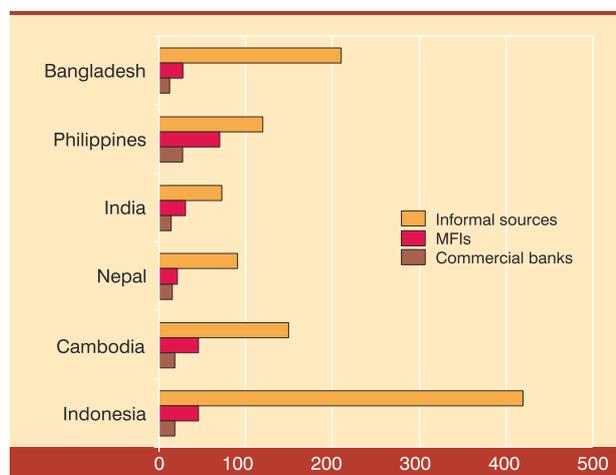
With regard to clients, ICTs can be used to expand the range of products and services offered by MFIs to their clients. The main technologies that have been identified are ATMs, point-of-sale (POS) devices and mobile phones.

There are different types of ATMs: they range from those that dispense only cash to those that offer a full range of services, such as accepting deposits and transferring money to different accounts. ATM networks are generally quite expensive to own and operate, although costs are falling thanks to improvements in technology, which may no longer be as prohibitively expensive as before (Baur, 2006). An ATM network allows customers to conduct transactions at their own convenience, and provides banks with a cheaper way of handling a high volume of transactions.

A POS network involves devices installed in stores and other appropriate outlets which enable customers to make their payments and transactions using their cards. These cards can be of the traditional magnetic-strip variety, or the more advanced, and more expensive, "smart cards" with an embedded chip, which can contain detailed transaction records and personal data to enhance security and facilitate transactions. Cards can also store value on a prepaid basis and be used as a means of payment (Cracknell, 2004). POS devices tend to be cheaper than ATMs, and the outreach of a network of POS devices installed in small stores and shops can be greater than the outreach that can be achieved through an ATM network. As in the case of ATMs, such a network allows the MFIs to process a large volume of transactions more cost-effectively than over-the-counter operations. However, a POS network tends to be limited regarding the type of transactions that can be handled, and there are operational, and even regulatory, complexities that arise from the fact that retail outlets are in effect acting as agents for the MFIs.

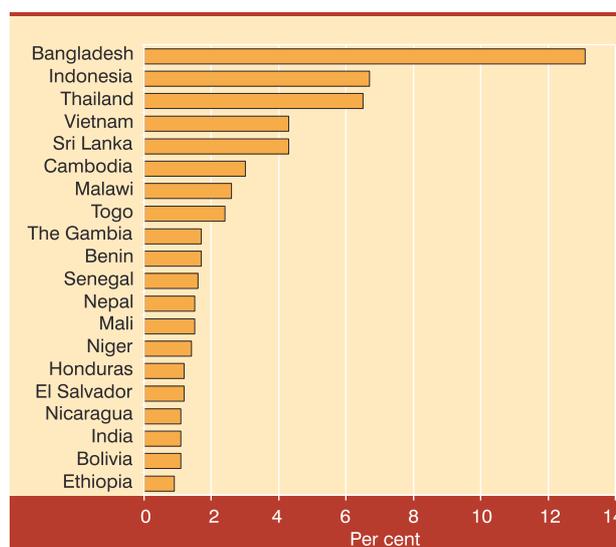
Lastly, mobile banking is an especially attractive channel in countries where a fixed-line network is not well established. In much of the developing world, mobile

Chart 5.4
Average annual interest rates



Sources: CGAP (2004); Coyle (2007).

Chart 5.5
MFI penetration rates



Sources: Daley-Harris et al. (2005); Claessens and Feijen (2006).

telephony has overtaken landlines in terms of access, volume of calls, and even affordability and reliability. People that own mobile phones but who have never had a bank account are now a widespread phenomenon. Some MFIs have tapped into this opportunity so as to offer microcredit loans and other financial services via menu-driven systems or via SMS text messaging. The advantages of these channels include simplicity and user-friendliness, and the fact that the infrastructure is in many cases already in place (Cracknell, 2004).

Apart from lowering transaction costs, the primary additional benefits of having these new channels of delivery are the increase in the volume of transactions by increasing their accessibility and expanding outreach, especially to more remote places, and, by extension, the increase in the convenience for customers.

As in e-banking in general, a number of factors have been identified that determine the value attached by customers to moving away from cash to electronic solutions in microfinance. The additional features offered by the new technology to customers include acceptability, accessibility, affordability and ease of use (Cracknell, 2004). Stemming from these features, the key drivers in determining the success or failure of client adoption of a new technology within the context of microfinance are its perceived increase in value; the level of education and training of the customers, and thus their comfort level in using this technology; its usability; the cultural fit of the technology within the community; and whether or not clients have sufficient trust in the new technology (Ivatury, 2004).

To reach greater levels of efficiency in organizations, ICTs should be integrated into the management information system (MIS) to make it possible to automate the flow of information and thus ensure the smooth running of agreed procedures and networking between employees. Although this is technically incorrect, the MIS of a bank or financial institution is treated like its back-office operations. For an MFI, there are three key areas of an MIS: the accounting system, the credit and savings-monitoring system, and the client impact data-gathering system.²⁸

Existing software packages for the accounting system are abundant and easily found. They differ widely depending on the specific needs as well as legal requirements of the MFI and the country in which it operates. The decision on a credit and savings monitoring system, however, is often more complicated. There are no real standards or guidelines. This is because a well-thought-out system should fit the needs and operations of the MFI using it. MFIs differ from one to another and hence there is no off-the-shelf software that can address the requirements of every MFI. They are at the same time less complex in terms of operations, than commercial banks (Ahmad, 2006). The software should facilitate transfer of data to and reconciliation with the accounting system. Integrated systems do precisely that, but they are usually quite expensive, especially if a high level of customization is required. The third system, for client impact, is usually designed informally, if at all (CGAP, 1998, 2001).

In order to maximize the benefit of cost efficiency and for the technologies to be sustainable, there needs to be a sufficiently large volume of participants. This calls for a shared infrastructure among MFIs. However, experience has shown that sometimes MFIs resist cooperation for fear that their competitive advantage will be lost (Firpo, 2006).

There are benefits in addition to increased efficiency and lower operating costs that MFIs can reap from technology – for example more informed decision-making, increased flexibility, and better transparency and reporting, the latter being especially important for MFIs that are dependent on donor funds (CGAP, 2006).

Generally, MIS can be categorized into three types: manual systems that are still in being used by very small organizations; semi-automated systems, which do not completely satisfy organizations' information requirements; and fully automated systems. Most MFIs are in a semi-automated mode. No matter what the level of automation is, for an MIS to be effective, it must be cost-effective and fulfil business requirements, while being flexible regarding future changes, reliable, simple to use, scalable to accommodate the growth of the business, and integrated amongst the branches of the business to produce a single consolidated picture (Ahmad, 2006).

Because many MFIs have branch offices, as part of their mandate to reach out to geographically remote areas, the issue of networking needs to be addressed. The World Bank suggests that each branch should at the very least have its own MIS and database. If resources allow, the MFI should consider networking all branches together, which would allow real-time access to up-to-date information, which in turn would greatly improve information efficiency. However, setting up and maintaining a network can be quite costly, adding another level of complexity to its day-to-day operation. Moreover, many of the branches in the rural areas of the developing world are constrained by the level of reliable communication infrastructure available, and establishing a network may not be feasible at all. Furthermore, in locations with harsh environments, the need to support and maintain hardware equipment in the branches may even outweigh any benefits provided by the technology (Gagnon 2006).

The recurring lesson from the experience in the field has been that ICTs are not a fix-all solution. A careful analysis of an MFIs' operations and its exact ICT needs should be conducted before an investment decision on

the implementation of a new system, be it on the client delivery side or in the back-office. So far, even among leading MFIs, using technology productively is still an exception rather than the rule (Ivatury, 2004). Therefore, while it is recognized that most MFIs do eventually need an MIS system, it may not always be abundantly clear to decision makers that such an investment is needed. A balance needs to be sought between solutions that are appropriate and those that are state-of-the-art but are of limited practical use because of constraints in the local context. Such constraints could be anything from an inadequate telecommunications infrastructure to the prevalence of illiteracy. Technologies need to be not only innovative, but also appropriate and designed to scale (Firpo, 2006).

Since in general the cost associated with building the infrastructure for the new technology is too high for MFIs to bear on their own, external funding sources are often needed (Firpo, 2006). The management of the MFI and the donor organization or outside investor need to ask questions about the proper fit of any proposed adoption of technology with the strategy and structure of the institution, as well as carefully weighing the monetary cost and the ongoing resource requirements needed to maintain the system. As part of that process, Ivatury makes four recommendations about how to overcome the common challenges that an MFI faces in tackling technology projects. First, manual processes should be improved and streamlined; second, the decision makers need to ask the right questions; third, independent expert advice should also be sought; fourth, there should be plans to train staff on an ongoing basis.

E. Regulatory issues related to e-banking and e-payments

E-banking and e-payments are increasingly being scrutinized worldwide by regulators that are trying to ensure financial stability without impeding technological innovation, especially in the banking industry. The main CBs are coordinating their efforts in this field with support of BIS through the Basel Committee on Banking Supervision (the latter deals with IT-related operational risks), the Committee on Payment and Settlement Systems and other forums. Consensus achieved here is not binding for developing and transition economies' CBs, but the latter normally consider above frameworks as those generating best practices and normally follow their recommendations.²⁹ The CB's have a dual role as facilitator and regulator

of e-banking. The United States Federal Reserve is an important example, as it operates an ACH and Fedwire. It has introduced FedLine for the web and other electronic products (Blakeley and Matsuura, 2003). Regulation is especially important now since e-banking may be subject to security breaches that can undermine confidence and thus the stability of the banking sector. In terms of regulations the Basel Committee has laid down guidelines, which the CBs have elaborated on (Bernanke, 2006). For example, the Federal Financial Institutions Examination Council in the United States has developed them in more detail and the Singapore Monetary Authority has developed its policy statement on Internet banking. But more legislation is needed, including on such essential elements as electronic signatures (making them legally binding), money laundering and others (FFIEC, 2003).

There are several tools that regulators can use. These include existing regulations and laws adapted to the requirements of above-mentioned Committees, and making sure that banks have adequate facilities for training staff in new technologies. The legal definition and recognition of new methods of conducting transactions and the international harmonization of regulations are important for preventing a "race to the bottom" and also properly defining the roles of host and home country jurisdictions as regards international banks and cross-border customers (Nsouli and Schaechter, 2002; Mu, 2003). It is important that new risks and challenges be integrated into the evaluation criteria for banks. Ironically, regulation is most needed where it is hardest to implement, as Ezeoha (2006) explains in the case of Nigeria, where there is a need to protect an emerging banking industry and also the country's international reputation by addressing "Internet fraud" and deeper problems in the politico-economic system.

However, even once laws are in place careful implementation is needed. In South Africa banks have been accused of unjustifiably requesting online customers in cases of identity theft to sign away their rights to money that might be eventually returned. Also, the standards of banks' security training and advice on their websites are still relatively low (Clayton, 2006). Another regulation-related issue is the need for a comprehensive system. For example, in India the data protection law emphasizes that hackers should be punished. However, firms are under no obligation to prevent them from being able to hack into the systems in the first place. Thus the law does not really serve the consumers' interest (Gupta, 2006). Here also legislation prevents anyone other than a security guard and the

customer from being present at an ATM, and thus new customers cannot be taught to use ATMs. In spite of major advances in financial sector liberalization, Indian banks were not allowed to compete with rural regional banks, and hence expand a network of ATMs to optimize their value (Cracknell, 2004).

In South Africa security is still a major problem, especially since organized crime groups have developed software to steal passwords and identities (Meyer, 2006). The law is uncertain, both in its terminology and whether or not it applies to online banking. South African banks have experimented with several measures. Nedbank has an SMS authorization system whereby a payment needs to be secured by the customer's providing a unique reference number sent to his or her mobile phone before it can be completed. This is mobile-phone-based and hence avoids viruses and data miners on the customer's computer. Standard Bank, the second largest bank by market share (Singh and Malhotra, 2004), has also developed a similar system, whereby passwords are supplied to phones and not via a computer (Rombel, 2005).

In relation to self-regulation, the World Bank has made a number of policy recommendations for e-banking. These include establishing a comprehensive security control process, centralizing back office operations; developing an automated credit authorization system by developing an appropriate credit scoring system; comprehensive oversight of outsourcing partners; and proper inclusion of e-banking risks in the overall risk assessment. Authorities should provide oversight of security controls and of outsourcing and partnership arrangements, provide the infrastructure and human capacity for technology adoption, and create appropriate regulatory frameworks. By doing that they strengthen the payments and settlement systems, as well as improve transaction-reporting services. Also, they should use new technology to better disseminate information, especially relating to credit, and to establish set up registers for collateral. Regulation by the public sector is needed, they argue, in order to organize security procedures and standards for electronic signatures (Mu, 2003).

As regards at the "bigger picture", the role of CBs has also changed with technology (Quaden, 2002). They need to adapt monetary-policy-setting rules related to the use of new technologies. Since e-banking makes transactions cheaper and easier, users of money do not have to hold cash balances for as long, and incur the losses of doing so. There is also increased access to interest-bearing assets via the Internet, especially to

households and SMEs, and thus there is more incentive not to hold cash balances. This means that money demand is more sensitive to interest rate changes (Fullenkamp and Nsouli, 2004). The role of the CBs is to ensure, together with monetary stability, the stability of the banking sector. This means they must adapt to the changes in banking technologies and techniques. That includes developing secure and technologically advanced payments and settlement procedures, especially cross-border ones. Broadening the scope of CB research beyond the effect of their policy on the real economy is one of the important steps in that respect. The continued implementation of the Basel accords should assist in this transition (Bernanke, 2006). Finally, there is a need to recognize the bypassing of banks by non-bank electronic payments providers (Bounie and Gazé, 2007), and thus a need to develop a regulatory oversight over those institutions as well.

F. Conclusions

E-banking is increasingly becoming Internet banking or online banking. Other electronic means such as ATMs continue to play a major role, especially in the context of developing countries. Moreover, various forms of basic card-based operations and m-payments are becoming important elements of e-payments in many of those countries.

Domestic and regional banks in developing countries have tried to catch up with international banks and have developed websites that perform various tasks ranging from provision of information and product marketing to e-payments and complex online trades. More facts are confirming the early findings that Internet banking (if only as part of "click and mortar" business models) can increase efficiency and hence profitability, and provide services not provided before. Moreover, while online banking can be initially biased towards more sophisticated and affluent customers, its dramatically lower unit transaction costs can permit much better access to finance and e-finance for SMEs and micro-enterprises as well as households in general. Thus there are possibilities for expanding the customer base with further efficiency gains for both banks and customers.

Customers can be encouraged to take up e-banking if they are supported in beginning to use the Internet for other activities. Programmes to increase computer literacy and assist banks in developing secure, user-friendly websites should be put in place. They should target in particular those segments of the population

that have been slow to accept Internet banking. This can be done as a cooperative effort by banks, national authorities and international organizations.

In the case of ATMs and m-payments the issue is less of encouragement, and more of providing infrastructure and service, which are already attractive.

The security risks do not disappear as Internet banking becomes established. This leaves room for the introduction of better security systems by financial service providers and their technology vendors, better regulation in finance and telecommunications, and improved coordination between them. Information and educational programmes empowering consumers with better ways of securely using their means of electronic access to finance should also be put in place. Regulation needs to be more than the passing of laws and issuing of guidelines, and should look at implementation and tackling the root causes of problems.

The major inter-bank messaging networks, and in particular SWIFT, have evolved into online services and will continue to develop as such. The challenge for them is in the trade-off between further expansion and the need to maintain a high level of security. As developing country CBs and banks are developing their own ACHs and RTGS systems and are increasingly participating in regional and global RTGS systems, it is important that their efforts be coordinated, such coordination helping them to increasingly integrate into the global payments system.

The e-payments issue also includes the future of payment cards that are increasingly adopting smart-card technologies. The market is an interesting one. While it is still dominated by a few players, it is also accepting new players, who compete vigorously and have pushed for the altering of business models in recent years. It remains to be seen where the payment card markets go from here and how they adapt to emerging challenges.

The emergence of mobile devices as a means of e-payments and the development of m-banking might also have a promising future, especially for the

“unbanked” population, which is still in a majority in many developing countries.

Once reliable and operational infrastructure is in place, e-banking can increase efficiency and improve service, or simply provide a service where there was none before. The challenge here is the correct level and style of regulation and encouragement for e-banking by CBs.

While e-banking penetration might reach in the coming decade saturation point in some developed markets it still has to be introduced in the majority of developing countries and has a long way to go before those countries mature in terms of using e-banking. While many countries face the dilemma of the relatively low cost of labour and the need for a high level of initial investment in ICTs, the importance of having a modern financial sector increasingly pushes for the second solution at least at the level of major local banks. The same is also true for remittances, SME finance and microfinance, provided that ICTs with the appropriate level of sophistication are put in place in each case.

As for microfinance, basic and low-cost ICT solutions could be the right answer. Also, private – public partnerships to serve the financial needs of the poor is one of the keys to addressing the issues of adequate investment in MFIs and their technological infrastructure, including hardware and software applications and trained personnel.

More generally, CBs and ministries of finance should carefully consider integration and intertwining of strategies to further develop the use of ICTs in financial services. The creation of a supportive environment by policymakers in developing and transition economies to facilitate the development of what is the most information-intensive sector of the economy is essential for encouraging financial service providers and their competitors such as mobile network operators to start and further develop the e-banking and e-payment services.

References and bibliography

- Adelaar T, Bouwman H and Steinfeld C (2004). Enhancing customer value through click-and-mortar e-commerce: implications for geographical market reach and customer type. *Telematics and Informatics* 21, pp. 167–182.
- Ahmad A (2006). Management information systems (MIS) for microfinance. Foundation for Development Cooperation, Brisbane, Australia.
- Ainin S, Lim CH and Wee A (2005). Prospects and challenges of e-banking in Malaysia. *Electronic Journal on Information Systems in Developing Countries*, vol. 22, no. 1, pp. 1–11.
- Akinci S, Aksoy S and Atilgan E (2004). Adoption of Internet banking among sophisticated consumer segments in an advanced developing country. *International Journal of Bank Marketing*, vol.22, no. 2/3, pp. 212–232.
- Arnone M and Bandiers L (2004). Monetary policy, monetary areas, and financial development with electronic money. *IMF Working Paper* WP/04/122.
- Arumuga S (2006). Effective method of security measures in virtual banking. *Journal of Internet Banking and Commerce* 11, 1.
- Basel Committee on Banking Supervision (2001). Risk management principles for electronic banking.
- Baur T (2006). Set to leapfrog? *id*, vol. IV, no. 5 pp.13–15.
- BCG (2006). Navigating to in: global payments 2006. By Viner N, Creighton A, Carl Rutstein C and Storz N. May.
- Beck T, Demirguc-Kunt A and Martinez Peris MS (2005). Reaching out: access to and use of banking services across countries. World Bank, Research Department, September.
- Bernanke, BS (2006). Modern risk management and banking supervision. *BIS Review*, 52.
- BIS (2004). *Survey of Developments in Electronic Money and Internet and Mobile Payments*. Committee on Payment and Settlement Systems, Bank for International Settlements, March.
- BIS (2007). Statistics on payments and settlements. *BIS Quarterly Review*, Part 4, pp. 41–53, June.
- Blakeley CJ, and Matsuura JH (2003). Electronic banking: how e-government can foster e-commerce. *Government Technology International*, August.
- Bounie D and Gazé P (2007). Payment and the Internet: issues and research perspectives in economics of banking. In: Brousseau E and Curien N ed. *Internet and Digital Economics*, Cambridge University Press: 569–588.
- Brown I, Hoppe R, Mugeru P, Newman P and Stander A (2004). The impact of national environment on the adoption of Internet banking: comparing Singapore and South Africa. *Journal of Global Information Management*, 12, 2, pp.1–26.
- CGAP (Consultative Group to Assist the Poor) (1998). *Management Information Systems for Microfinance Institutions: A Handbook*. Technical Tool Series No.1, CGAP/World Bank.
- CGAP (2001). *Using Microfin 3: A Handbook for Operational Planning and Financial Modelling*. Technical Tool Series No. 2.
- CGAP (2004). Interest rate ceilings and microfinance: the story so far. Occasional Paper 9.

- CGAP (2005). Funding microfinance technology. Donor Brief No. 23.
- CGAP (2006). Using technology to build inclusive financial systems. Focus Note No. 32.
- Claessens S and Feijen E (2006). Financial sector development and the Millennium Development Goals. World Bank Working Paper No. 89.
- Clayton C (2006). Banks “fail” to protect online clients. *Personal Finance*, 8 July.
- Coyle D (2007). Overview: the transformational potential of m-transactions. Vodafone Policy Paper Series, No. 6, July.
- Cracknell D (2004). Electronic banking for the poor: panacea, potential and pitfalls. *Small Enterprise Development*, vol. 15, no. 4, pp. 8–24.
- Cyree K, Delcours N and Dickens R (2005). Is Internet-only banking the goose that lays golden eggs? An examination of performance and prospects for the future. University of Mississippi and University of South Alabama.
- Daley-Harris S et al. (2005). State of Microcredit Summit Campaign Report 2005.
- Daley-Harris S et al. (2006). State of Microcredit Summit Campaign Report 2006.
- Dandapani K (2004). Success and failure in web-based financial services. *Communications of the ACM*, vol. 47, no. 5, pp. 31–33.
- Diniz E, Morena Porto R and Adachi T (2005). Internet banking in Brazil: evaluation of functionality, reliability and usability. *Electronic Journal of Information Systems Evaluation*, vol. 8, no. 1, pp. 41–50.
- Dospinescu O and Rusu D (2006). The adoption of electronic banking services in developing countries: the Romanian case. Future of Banking After the Year 2000 in the World and in Czech Republic, Social Science Research Network, New York.
- Ezeoha AE (2006). Regulating Internet banking in Nigeria: some success prescriptions – part 2. *Journal of Internet Banking and Commerce*, vol.11, no.1.
- Federal Financial Institutions Examination Council (FFIEC) (2003). *E-Banking IT Examination Handbook*.
- Ferro LG and Weber S (2006). Measuring the performance of microfinance institutions. Social Science Research Network, New York.
- Firpo J (2006). Banking the unbanked: technology’s role in delivering accessible financial services to the poor. Microdevelopment Finance Team. Development Gateway Foundation, Washington.
- Fox S and Beier J (2006) Online banking 2006: surfing to the bank. Pew Internet & American Life Project, 14 June.
- Fugfugosh M (2006). Informal remittance flows and their implications for global security. GCSP Policy Brief No. 11, Geneva, September.
- Fullenkamp CI and Nsouli SM (2004). Six puzzles in electronic money and banking. IMF Working Paper 04/19.
- Furst K, Lang WW and Nolle DE (2002). Internet banking: developments and prospects. *Journal of Financial Services Research*, vol. 22, no. 1–2, pp. 95–117.

- Gagnon G (2006). Innovations in information technologies. The Microcredit Summit Campaign.
- Goi CL (2005). E-banking in Malaysia: opportunity and challenges. *Journal of Internet Banking and Commerce*, vol. 10, no. 3.
- Gupta A (2006). Data protection in consumer e-banking. *Journal of Internet Banking and Commerce*, vol. 11, no.1.
- Hadidi R (2003). The status of e-finance in developing countries. *The Electronic Journal on Information systems in Developing Countries*, vol. 11, no. 5, pp.1–5.
- Hasan I (2002). Do Internet activities add value? The Italian bank experience. Federal Reserve Bank of Atlanta, Berkley Research Center, New York University.
- Hawkins J and Dubravko M (2001). The banking industry in the emerging market economies: competition, consolidation and systemic stability – an overview. *BIS Papers* No. 4.
- Idowu PA, Alu AO and Adagunodo ER (2002). The effect of information technology on the growth of the banking industry in Nigeria. *Electronic Journal on Information Systems in Developing Countries*, vol. 10, no. 2, pp.1–8.
- ITU (2007). World Telecommunication/ICT Indicators Database.
- Ivatury G (2004). Harnessing technology to transform financial services for the poor. *Small Enterprise Development*, vol. 15, no. 4, pp. 25–30.
- Kalan G and Dilek A (2005). Assessment of remittance fee pricing. Background Paper for the World Bank's Global Economic Prospects, 2006.
- Kerem K (2003). Internet Banking in Estonia. PRAXIS Working Paper 7.
- Li S and Worthington AC (2004). The relationship between the adoption of Internet banking and electronic connectivity: an international comparison. Queensland University of Technology Discussion Papers in Economics, Finance and International Competitiveness. Discussion Paper No. 176.
- McKinsey (2007). Fulfilling the potential of Latin America's financial systems. By Andrade L, Farrell D and Lund S. *McKinsey Quarterly*, May.
- Meyer J (2006). Cash, the web and the mousetrap. *Sunday Tribune*. 16 July, South Africa.
- MIT Sloan School of Management (2004). Global e-readiness – for what? readiness for e-banking". MIT Sloan Working Paper 4487.
- Mu Y (2003). E-banking: status, trends, challenges and policy issues. *Financial Economist*. World Bank.
- Novametrie (2004). A new wave of Internet banking? Survey. White Paper.
- Nsouli SM and Schaechter A (2002). Challenges of the “e-banking revolution”. *Finance and Development*, vol 39, no 3, pp. 48–51.
- OECD (2006). Online payment systems for e-commerce. Working Party on the Information Economy. DSTI/ICCP/IE(2004)18/REV1.
- Orozco M (2004). The Remittance Marketplace: Prices, Policy and Financial Institutions. Washington, DC: Pew Hispanic Center.

- Orozco M (2006). International flows of remittances: cost, competition and financial access in Latin America and the Caribbean – toward an industry scorecard. Report presented at the meeting on “Remittances and transnational families” sponsored by the Multilateral Fund of the Inter-American Development Bank and the Annie E Casey Foundation.
- Quaden G (2002). Editorial: central banking in an evolving environment. *Journal of Financial Regulation and Compliance*, vol. 10, no. 1, pp. 7–13.
- Ratha, D and Riedberg, J (2005). On reducing remittance costs. Background Paper for the World Bank’s Global Economic Prospects 2006.
- Roberts, BW and Banaian K (2005). Remittances in Armenia: Size, Impacts, and Measures to Enhance their Contribution to Development. Yerevan: Armenian International Policy Research Group.
- Rombel A (2005). Next step for Internet banking. *Banking ServiceZone.Org*.
- Simpson B (2005). Cards recharged. *Credit Card Management*, vol. 18, no. 1, pp. 32–39.
- Simpson J (2002). The impact of the Internet in banking: observations and evidence from developed and emerging markets. *Telematics and Informatics*, vol. 19, pp. 315–330.
- Singh B and Malhotra P (2004). Adoption of Internet banking: an empirical investigation of Indian banking sector. *Journal of Internet Banking and Commerce*, vol. 9, no 2.
- Siriluck R and Speece M (2005). The impact of web-based service on switching cost: evidence from Thai Internet banking. *ACM International Conference Proceeding Series*, vol. 113.
- UNCTAD (2000). E-commerce and financial services. Section IV, Chapter 2, *Building Confidence: Electronic Commerce and Development*, United Nations, 2000.
- UNCTAD (2001). Managing credit risks online: new challenges for financial service providers. Chapter 7, *E-Commerce and Development Report 2001*, United Nations, New York and Geneva.
- UNCTAD (2002). E-finance for development: global trends, national experiences and SMEs. Chapter 6, *E-Commerce and Development Report 2002*, United Nations, New York and Geneva.
- UNCTAD (2005a). E-credit information, trade finance and e-finance: overcoming information asymmetries. Chapter 3, *Information Economy Report 2005*, United Nations, New York and Geneva.
- UNCTAD (2005b). Protecting the information society: addressing the phenomenon of cybercrime. Chapter 6, *Information Economy Report 2005*, United Nations, New York and Geneva.
- UNCTAD (2007). *World Investment Report 2007*, United Nations, New York and Geneva.
- World Bank (2007). Financial flows to developing countries: recent trends and prospects. Chapter 2, *Global Development Finance Report 2007*.
- Yeap BH, and Cheah KG (2005). Do foreign banks lead in Internet banking services? *Journal of Internet Banking and Commerce*, vol 10, no. 2.

Notes

1. See the Introduction to this Report.
2. The current Report is also covering the issue of ICT induced innovations in business processes in Chapter 4, “ICT, E-Business and innovation policies in developing countries”.
3. Kevin M. Warsh, Financial intermediation and complete markets, *BIS Review* 59/2007.
4. E-money may be defined as a monetary value stored in an electronic device in the possession of its owner.
5. Basel II is the framework, revised by the Basel Committee on Banking Supervision, governing the capital adequacy of banks (for more details see: <http://www.bis.org/publ/bcbsca.htm>).
6. M Wolf. Unfettered finance is fast reshaping the global economy. *Financial Times*, 18 June 2007.
7. P Tucker. A perspective on recent monetary and financial system developments. *BIS Review*, 44/2007.
8. C Graeber. US online banking: five-year forecast, *Forrester*, 2 April 2007.
9. Has your computer been hijacked? *E-Marketer*, 7 June 2007.
10. See www.visa.com, www.mastercard.com, www.paypal.com.
11. See www.theclearinghouse.org.
12. Payments industry sees strength of SwiftNet tool. *The Banker*, June 2005; The race belongs to the SWIFT. *Bank Systems & Technology*, CMP, 27 June 2003.
13. See www.swift.com.
14. M Vickers. Plastic under attack. *Fortune*, 17 May 17 2006.
15. Cashiered. *The Economist*, 7 April 2007, p. 70; see also www.nilsonreport.com.
16. See www.mastercard.com.
17. See www.visa.com.
18. See <http://www.federreserve.gov/BoardDocs/Press/other/2004/20041206/default.htm>.
19. Online Payments: A Battle at the Checkout, *The Economist* May 5, 2007, p.p. 75-76; www.paypal.com; <http://finance.yahoo.com>; <http://checkout.google.com>.
20. http://ec.europa.eu/internal_market/payments/framework/index_en.htm.
21. See www.weforum.org ; <http://globaltechforum.eiu.com>.
22. See www.nibs-plc.com.
23. See www.theworx.biz/bank04.htm.

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24. See <http://www.ceris.ro/e-banking>; www.verisign.com; www.digipasspack.com.
25. For more details on mobile penetration, see chapter 6: “Mobile telephony in Africa: a cross-country comparison” of this Report.
26. Dial M for money. *The Economist*, 30 June 2007, pp. 74 – 75.
27. Mexico finance: Chase offers free money transfer. *EIU Industry Briefing*, 25 June 2007.
28. See www.microfinancegateway.org.
29. See: www.bis.org.

