

10 PAYMENT AND SETTLEMENT SYSTEMS

10.1 Overview

An efficient and well functioning payment system infrastructure is essential in safeguarding financial stability and promoting economic activities in an economy. It reduces financial risks by increasing the reliability and speedy settlement of transactions, while also facilitating the effective implementation of monetary policy by strengthening its transmission mechanism. Central banks, in their capacity as custodians of the payment system infrastructure, thus have strong incentives to establish and ensure their smooth functioning.

The payment system infrastructure in Pakistan has gradually evolved from the traditional cash and paper-based modes of payment to a more sophisticated, technologically driven system. A key development in this process of evolution was the launch of Pakistan's Real Time Interbank Settlement Mechanism (PRISM) for the settlement of large value transactions, with effect from 1st July 2008. To facilitate its operations, SBP issued PRISM Operating Rules for the convenience and guidance of the participants.

Additionally, SBP continues to encourage the use of information technology for retail transactions by providing an enabling policy environment. SBP has issued various guidelines for instance for the standardization of ATM operations, cardholders, settlement of intra and inter switch ATM transactions, in recent years. As a result, the retail payment system has witnessed significant improvement; the share of electronic transactions in the total number of transactions has gradually increased to 32.3 percent during FY09 as compared to 18.9 percent in FY06.

This chapter analyzes recent developments pertaining to both the large value and retail transactions executed by using electronic means of payment. Section II discusses the launch of PRISM and its impact on minimizing financial risks. Section III reviews developments in retail payment system during FY09. The final section concludes the chapter.

10.2 Pakistan's Real Time Interbank Settlement Mechanism (PRISM)

PRISM started operating from July 1, 2008 for the settlement of large value transactions. It facilitates the settlement of inter-bank and other critical transactions in real time across participants' settlement accounts held with the SBP. All commercial banks¹ and 3 Development Finance Institutions (DFIs) are its direct participants. PRISM rules also offer other participation categories including sub-participants, indirect participants and special participants. These participants are allowed the use of specific PRISM services depending on their status of participation. The direct participants have a direct connection and settlement account in the system, and are eligible for all types of transactions permissible in the system. On the other hand, clearing entities with a status of special participants can send only Net Clearing results through PRISM.²

Major services offered by PRISM include the real time settlement of cash payments and payments related to government securities. The system also allows online trading of government securities among the direct participants.³ It may be noted that the real time execution of these transactions requires sufficient balances in participants' settlement

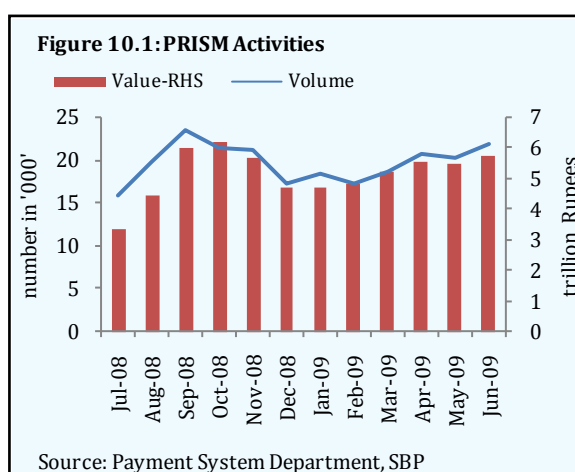
¹ PRISM participation as a direct participant is mandatory for the commercial banks holding Clearing House (NIFT) membership.

² For details, please see PRISM Operating Rules at <http://www.sbp.org.pk/rtgs/PRISM-OprRules.pdf>

³ Specifically, PRISM facilitates interbank fund transfers (IFT), delivery vs. payment (DVP), delivery vs. free (DVF), Own account transfers, intra-day liquidity and multilateral net settlement batches (MNSB) transactions.

accounts. To address this issue, the system offers two major options to the participants. First, the payment can be queued for settlement at a later time when sufficient funds become available. Participants can manage their own queues by changing their priority levels. Alternatively, the participant can avail the collateralized *Intra-day Liquidity Facility* (ILF) offered by SBP. The ILF is allowed against approved government securities as specified by the SBP. Following a bank's request for ILF, PRISM automatically transfers ILF eligible securities from bank's own portfolio to SBP's ILF portfolio and simultaneously credits funds against these securities to the bank's settlement account in PRISM. Participants are required to settle their ILF transactions by sending an ILF buy back request on the same day. All the unsettled ILF transactions are automatically settled at the end of the day, subject to the availability of sufficient funds in the account. In case of insufficient funds, SBP reserves the right to apply penalties or redeem any securities acquired through ILF. However, participants have the option of inter-bank borrowing (clean or repo) during the day, or to approach the discount window during a specified business period. For smooth functioning of the system, SBP has also issued 'Rules and Regulations' for the operations of PRISM.⁴ A help desk has also been established to address participants' complaints in a timely manner.

Transactional activities of PRISM indicate that the system was used to settle 236,412 transactions during FY09 (**Figure 10.1**). The value of these transactions was Rs 62.2 trillion, which is 4.8 times the GDP for the year. Trends in the number of transactions and their corresponding value indicate that PRISM is (on average) used to settle 750 transactions on a daily basis, worth Rs 200.0 billion, which implies that the average value of each transaction is slightly higher than Rs 250 million. The real time settlement mechanism of such large value transactions is a welcome development for the payment system infrastructure of the country, as it contributes to effective risk management by reducing systemic and credit risks. It also allows banks in managing their liquidity more prudently.



Transactional activities of PRISM for the first year of its operations highlight the importance of large value transactions for liquidity risk. Notably, the gross value of transactions is substantially higher than the cash holdings with banks and banks' balances held with the SBP. Specifically, banks' weekly cash holdings and balances held with the SBP during FY09 averaged at Rs 77.9 billion and Rs 201.0 billion respectively, as against the gross value of PRISM transactions at Rs 62.2 trillion. This implies that daily flows in high value transactions are subject to high volatility, i.e. total amount received or paid is substantially higher than the reserves held by banks. It also highlights banks' dependence on incoming funds to finance outgoing transactions: a phenomenon also known as interdependence among banks. The notable nature of these flows allows a particular bank to rely on inflows from other banks to settle the transactions. Notably, the real time settlement of transactions allows participants to redeploy their funds during the same day. This velocity of the payment system creates liquidity in the interbank market and helps in prudent liquidity management. However, it should be kept in mind that any reluctance of market participants to deal with each other due to any reason can potentially reduce liquidity in the market. Even the presence of weak banks in the system can contribute to a lower level of available liquidity, as all other banks can be reluctant to deal with these banks.

⁴ PRISM Operating Rules at <http://www.sbp.org.pk/rtgs/PRISM-OprRules.pdf>

To avoid any gridlock in PRISM arising from insufficient funds during the day, the participants used the ILF to borrow Rs. 421.8 billion during H1-FY09. Daily data on ILF indicates that the maximum amount of gross ILF borrowing in a single day stood at Rs 43.0 billion in H1-FY09. This is substantially lower than the average daily volume of Rs 200.0 billion settled in the PRISM. Moreover, the maximum number of borrowers using this facility was only 6 as against 40 direct participants in the system.

PRISM and Monetary Policy Implementation

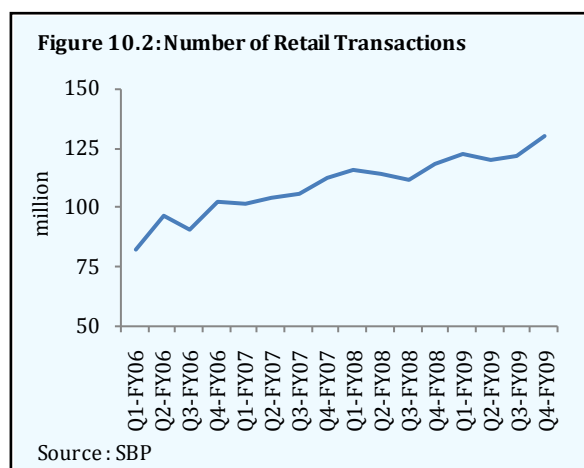
PRISM is also likely to strengthen the transmission mechanism of monetary policy, especially of a monetary policy which is operated on a market-based mechanism, as is the case in Pakistan, given the two-way causal relationship between monetary policy and the payment system. At one end, a well designed and efficient payment system influences the demand for money and the efficiency of some monetary policy instruments by affecting the speed of execution of financial transactions. On the other hand, monetary policy influences the available liquidity in the payment system and the opportunity cost of settling transactions. This suggests that the statutory cash reserves held by the banking system with SBP serve as the critical link between monetary policy and the payment system infrastructure. As a means of payment for interbank transactions and as a component of the monetary base, any change in the level of reserves is of vital importance.

It may be added here that the introduction of the explicit interest rate corridor “to reduce the volatility in short term interest rates and to bring more transparency in the implementation of monetary policy”⁵ with effect from August 17, 2009 is also going to affect the excess reserves held by the banking system. Under this mechanism, the scheduled banks and primary dealers now have access to an end-of-day repo facility for placing excess funds with the SBP at a ‘floor’ rate. This will essentially change the cost/incentive of holding excess balances. As a result, banks’ desire for holding excess balances may change in the following months. Moreover, the real time availability of information on liquidity in the inter-bank market, along with possible reduction in the level of excess funds with banks is likely to affect SBP’s monetary management, especially in the short run.

The next section reviews the developments in retail transactions.

10.3 Retail Payment System

The Retail Payment System (RPS) in Pakistan has undergone notable changes in recent years due to the growing role of electronic or e-banking as a mode of payment, especially for low value transactions. Although the ‘currency in circulation to deposit’ ratio increased during FY09 and cash continues to be the preferred mode of payment (especially for individuals), the number of retail transactions (paper based and electronic) increased to 495.1 million in FY09, compared to 459.3 million in FY08 (**Figure 10.2**). In tandem with the number of transactions, the value of transactions also increased to Rs 155.4 trillion during FY09, as against Rs 151.3 trillion in FY08. These developments are an encouraging sign for the progress of an efficient payment system, as non-cash (paper based and electronic) retail transactions are less costly and quicker to



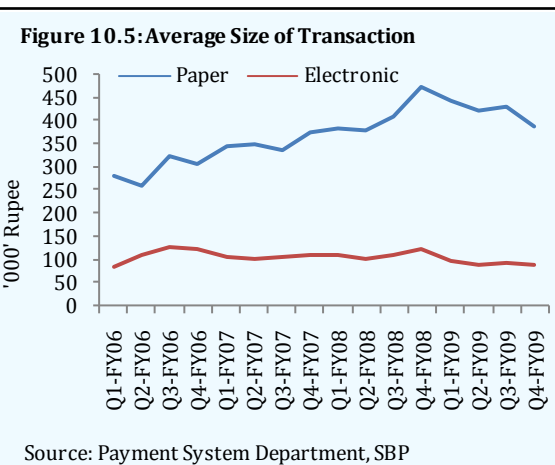
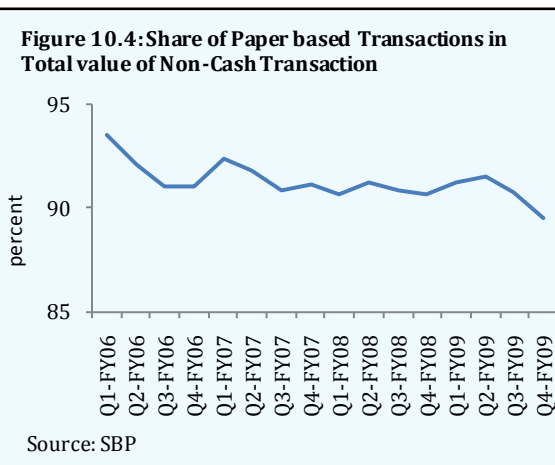
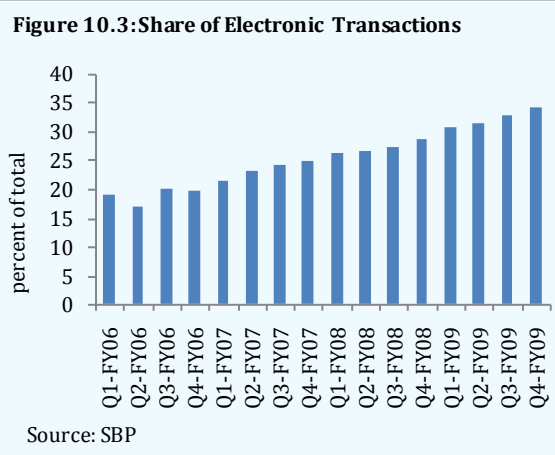
⁵ DMM Circular No. 1 dated August 15, 2009.

process as compared to cash-based transactions. Cash transactions require manual counting, verification of notes and storage arrangements, which increases the transaction time and cost. Additionally, deterioration in the law and order situation has increased the risk of theft/looting of currency notes. However, despite these risks, cash transactions are preferred by people due to a number of reasons including lack of customer awareness, limited access to other means of payments due to low financial penetration, issues related to tax evasion, preference to avoid documentation of transactions etc.

Within non-cash transactions, the number of electronic transactions increased YoY by 28.4 percent during FY09 to 159.8 million, while over the same period paper-based transactions registered a marginal increase of 0.1 percent to 335.3 million. The impact of these differences in growth rates is clearly visible from the increasing share of electronic transactions in the total number of transactions (**Figure 10.3**), which is primarily attributed to the improving infrastructure of e-banking, SBP's efforts to create an enabling policy environment, and launch of innovative products by banks.

Despite these developments, the non-cash means of payment is still dominated by paper based transactions which constituted 67.7 percent of the total transactions during FY09, though its importance is gradually declining. Notably, the value of paper-based transactions accounts for around 90 percent of the total amount of non-cash transactions (**Figure 10.4**). This relatively higher share of paper-based transactions in the total value compared to its share in the total number of transactions indicates that paper-based transactions are of a larger value as compared to electronic transactions. The average size of transactions also highlights this fact (**Figure 10.5**), at more than 4 times the average size of an electronic transaction. These trends suggest that the electronic means of payments are primarily used by individuals, while paper-based transactions are the preferred modes of payment for businesses.

Given this reliance on paper-based transactions, SBP has been striving to ensure their speedy settlement. In doing so, it facilitated the establishment of National Institutional Facilitation Technologies (Pvt.).



Ltd. (NIFT) in September 1995. NIFT is a joint venture between a consortium of six commercial banks⁶ and a private sector firm. It offers services for cheque clearing, same-day clearing (express-2 hours clearing service), inter-city clearing, and inter-branch & inter-bank settlement. As of May 2009,⁷ NIFT is operating with 20 data centers which provide services to 5,571 branches (i.e. over 90 percent of on-line branches) of 40 commercial banks in 185 major cities. In this way NIFT plays a key role in improving the settlement of paper-based transactions in the banking system.

The rest of this section reviews the composition of paper-based and E-banking services offered by the banking sector.

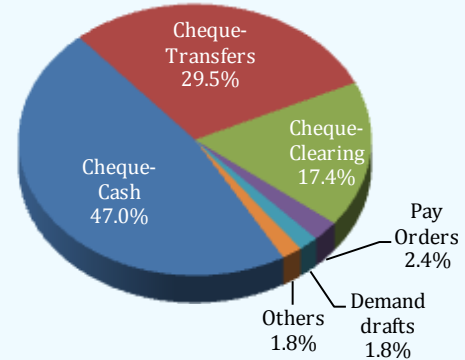
10.3.1 Paper-based Transactions

Cheques remain the most popular paper-based instrument, used for cash withdrawals, funds transfer and clearing, while other instruments include pay orders, demand drafts and telegraphic transfers. The composition of paper-based instruments indicates that cheques written for cash withdrawals accounted for 47.0 percent of the total paper-based transactions in FY09 (Figure 10.6), and that all cheque-based transactions (withdrawals, transfer and clearing) account for nearly 94.0 percent of all paper-based transactions. In terms of the amount, the value of these transactions at Rs. 141.3 trillion (10.8 times the GDP for FY09) was around 90.0 percent of the total value of paper-based transactions during the year. These statistics highlight the importance of paper-based instruments in the functioning of payment systems.

10.3.2 E-banking Activities

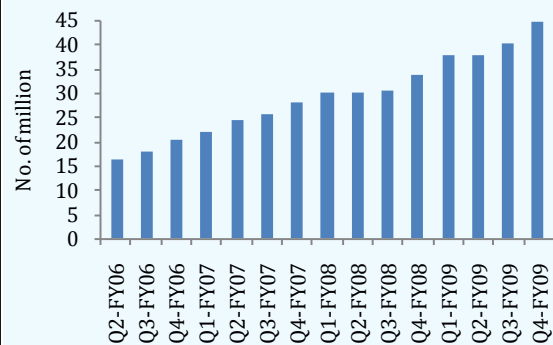
E-banking has grown tremendously in recent years. Considerable improvement in the e-banking infrastructure and activities during FY09 is a continuation of recent trends. The quarterly number of electronic transactions reached 44.5 million during Q4-FY09 as compared to 28.0 million in Q4-FY07, showing an increase of 58.9 percent in just two years (Figure 10.7). This clearly reflects the increasing use of e-banking services in the payment system infrastructure. This is an encouraging development as e-banking facilities provide a viable solution for expanding the outreach of financial services to remote areas.

Figure 10.6: Composition of Paper Based Instruments in FY09



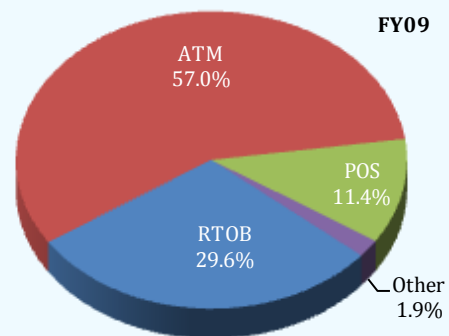
Source: Payment System Department, SBP

Figure 10.7: Quarterly Trends in Electronic Transactions



Source: Payment System Department, SBP

Figure 10.8: Composition of Electronic Transactions



Source: SBP

⁶ These banks include: Habib Bank Limited, MCB Bank Limited, National Bank of Pakistan, United Bank Limited, Allied Bank Limited, and First Women Bank Limited.

⁷ Latest available information available on the NIFT website.

The composition of electronic transactions indicates that ATM-based transactions account for over 50.0 percent of total electronic transactions, and that the share of these transactions is gradually increasing over time (**Figure 10.8**). This rise is attributable to both the increasing number of ATM card holders and the increasing number of financial services offered through ATMs. Real Time Online Banking (RTOB) transactions are the second largest component of electronic transactions, with a share of 29.6 percent in FY09. Transactions at POS terminals/machines account for nearly 11.4 percent of total electronic transactions, while transactions through internet, mobile banking and call centers constitute only 1.9 percent of financial transactions.

Real Time Online Banking

Banks in Pakistan have made consistent efforts since the early 1990s to automate a number of banking services to improve their operational efficiency and provide real time online banking services to their customers. However, the real impetus to these activities came in the recent past (2004 onwards) during which period the banking sector witnessed unprecedented growth in line with the boom in economic activities. Notably, the number of online branches, a prerequisite for RTOB, reached 6,040 by end FY09 as against only 322 at end 2000 and 1,738 in 2004.

As of end June FY09, the number of online branches constituted 68.2 percent of total bank branches. All these branches are offering RTOB facilities including cash withdrawals, deposits and funds transfer. Recent data on RTOB indicates that the number of transactions has witnessed a YoY increase of 28.3 percent during FY09 to reach 47.3 million (**Table 10.1**). The value

of these transactions was Rs 13.5 trillion, which is only 1.7 percent higher than their value in the previous year. This is also evident from the marked decline in the average size of transactions, which has dipped to Rs 286,343 in FY09 as against Rs 361,335 in the previous year. Despite this decline, the relatively large size of an average RTOB transaction indicates that this facility is primarily used by the corporate sector. Significant YoY growth in the number of transactions along with the marginal increase in the value of transactions is indicative of the liquidity problems faced by the corporate sector during FY09, given that it seems to have undertaken a larger number of transactions of relatively small amount to manage their funds.

ATMs

ATMs offer a wide range of round the clock retail banking facilities across the country. The major facilities include cash withdrawals, bill payments, fund transfers, payment of utility bills, cash deposits, balance inquiry, cheque book request, mini account statements etc. **Table 10.2** shows that the number of ATMs operating in the country increased to 878 during FY09 (to reach 3,999), which is higher than the increase of 827 ATMs during FY09. This is an encouraging development despite the difficult operating environment for banks.⁸

Table 10.1: Trends in Real Time On-line Banking

	FY07	FY08	FY09
No. of On line Braches	4,179	5,282	6,040
No. of Transactions '000'	30,733	36,855	47,279
Amt. of Transactions 'Bln Rs'	10,091	13,317	13,538
Average Size of Trans. '000 Rs'	328.3	361.3	286.3
Average Transactions Per day '000'	84.2	101.0	129.5

Source: Payment System Department, SBP

Table 10.2: Trends in ATM Transactions

	FY07	FY08	FY09
No. of ATMs	2618	3,523	3,999
No. of Transactions '000'	51,511	67,912	91,125
Amt. of Transactions 'Bln Rs'	316.2	4,530.0	668.5
Avg. Size of Trans. Rs	6139	6670	7336
Avg. Transactions Per day '000'	141.1	186.1	249.7

Source: Payment System Department, SBP

⁸ Details in Chapter 4, "Stability of the Banking Sector" in this edition of the FSR.

Concurrent to these developments, the number of ATM transactions has also risen from 67.9 million in FY08 to 91.1 million in FY09. On average, each ATM executed 71 transactions in a day during FY09, compared to 69 for FY08. The average value per ATM transaction has also gradually increased to Rs 7,336 as against Rs 6,670 in FY08. This increase is attributable to both the provision of funds transfer facilities by using ATMs and increased cash requirements due to the high inflation which prevailed during this period.

The composition of ATM transactions reveals that ATMs are primarily used for cash withdrawals and account-related information transactions, as the share of other services including funds transfer, cash deposits and utility bills payment was only 2.0 percent in the total number of transactions. Specifically, funds' transfer transactions conducted through ATMs were only 1.8 million during FY09 with an average value of Rs 48,311. However, YoY growth of 139 percent in these during FY09 is an indication of the increasing reliance on ATMs for this facility.

Cash deposit facility through ATMs has yet to take off in a real sense as this facility is not available on all the ATMs. Only a few banks offer this facility by using an envelope based or single/bunch note-acceptor mechanism. The activities on this front indicate that only 21,000 cash deposit transactions worth Rs 235.0 million were executed during FY09. In terms of the total volume of ATM transactions, these constitute just 0.02 percent. The use of this facility is expected to rise at a gradual pace as customers are generally reluctant to use it due to lack of technical know-how and fear of losing money.

The use of ATMs for the payment of utility bills is also a relatively new facility. A total of 44,807 bill payment transactions were made during FY09. The value of these transactions was Rs 80.0 million, indicating an average size of Rs 1,800. However, the use of this facility is expected to increase as each household has to pay at least three utility bills during a month.

Point of Sales (POS) Transactions

E-banking facilities help in executing payments at different merchant locations across the country. As of end June FY09, 49,715 POS machines/terminals were operating throughout the country. The number of credit and debit cards utilized for POS transactions over the same period were

1.7 million⁹ and 6.4 million respectively. The number of transactions executed on POS terminals increased YoY by 4.5 percent during FY09 to 18.3 million, while the value of these transactions increased YoY by 30.1 percent to Rs 89.6 billion in FY09 (**Table 10.3**). While the gradual growth in the number of transactions can be attributed to the overall slowdown in economic activities, over 30.0 percent rise in their value is reflective of strong inflationary pressures in the economy.¹⁰

Other Channels of E-Transactions

In addition to the facilities reviewed above, the banking sector also offers phone banking, internet banking, mobile banking and internet merchant banking facilities. The use of all these facilities is still limited as the cumulative number of such transactions is only 1.9 percent of total electronic transactions. Some of the developments in these modes of transactions are:

Table 10.3: Trends in POS Transactions

	FY07	FY08	FY09
No. of Transactions in '000'	15,589	17,485	18,280
Amt. of Transactions 'Bln Rs'	53.7	68.8	89.6
Avg. Size of Trans. Rs'	3447	3937	4901
Avg. Transactions Per day'000'	42.7	47.9	50.1

Source: Payment System Department, SBP

⁹ This also includes 2,468 Shariah-compliant credit cards.

¹⁰ CPI inflation was 20.8 percent during FY09.

- Internet banking facilitates payments and electronic fund transfer facilities. This facility is primarily available for intra-bank account to account transfer of funds. The data for the last quarter of FY09 indicates that 0.6 million transactions worth Rs 22.2 billion were executed using this channel.
- A few banks are also offering financial services through the Call Center/Interactive Voice Response mechanism. Banks executed 0.3 million such transactions during Q4-FY09, with a value of only Rs 1.8 billion.
- Some of the banks in Pakistan are offering limited mobile banking facilities including payment through mobile phones, A/c to A/c funds transfers and utility bills payments. Banks executed 71240 such transactions during FY09, worth Rs 15.7 million.
- Banks also facilitate customers to open internet merchant accounts as part of the Internet Merchant Banking facility. There were only 19 internet merchant accounts as of end FY09, which are used by the services sector and NGOs. In FY09, the banking sector executed 52,860 transactions through this channel, worth 372.3 million.

Cross Border E-banking Transactions

E-banking offers cross-border transaction facilities to customers through ATMs, POS terminals and Internet banking. POS terminals have a dominant share of these transactions. Specifically, the rupee value of POS transactions was 62.7 percent of inward remittances (inflow of money) and 78.5 percent of outward remittances (outflow of money) in FY09. In absolute terms, the inflow of money on account of cross-border e-banking transactions was Rs 24.3 billion in FY09 as against an outflow of Rs 13.0 billion.

Internet transactions also include purchase of goods and services from foreign/local internet merchants. Inflow of money on these transactions was only Rs 0.3 billion during FY09 compared to outflow of Rs 1.1 billion. Finally, the inflow of money on ATM transactions was Rs 8.8 billion during FY09 against outflow of Rs 1.7 billion.

Although the share of these transactions is minuscule in the total value of electronic transactions, cross-border transactions are likely to increase as trade activities are expected to strengthen given that the prospects for global economic revival are encouraging.

While the increasing number of e-banking activities helps in improving the operational efficiency of the banking system and extending outreach of banking services to remote areas, these activities add another dimension to the risk profile of the banking sector. Specifically, the expanding use of e-banking services increases banks' reliance on third-party information services providers, which can significantly impact information security risk. It may be noted that the specific nature of information security risks vary according to the nature of transaction. There is a lower probability of risk from informational transactions (like balance inquiry, mini statement, request for cheque book etc), while it the risk can be relatively higher for transactional services. Notably, information security risk also varies according to the delivery channel used, given that it has a higher probability of occurrence in internet banking as compared to transactions conducted thorough different kinds of cards. In case of internet banking, the network is universally accessible and banks are exposed to viruses, hackers, insider attacks, data theft, data destruction etc. The high speed of technological change also tends to increase such risks.

Besides adding new risks, the increasing number of e-banking activities also intensifies the degree of traditional risks faced by banks. The use of e-banking tends to impact banks' liquidity risk by potentially increasing the volatility in banks' assets and deposits. Similarly, poorly executed e-banking activities can add to reputational risk. Being cognizant of all these issues, both the SBP and the banks have strived to minimize risks related to e-banking

services. Moreover, the government has promulgated the Payment Systems and Electronic Funds Transfer Act 2007 to provide legal backing to e-banking services. As mentioned earlier, SBP has also issued operational guidelines for ATMs and credit card business in Pakistan. These guidelines set forth the minimum operational standards and help in managing risks related to e-banking services.

10.4 Conclusion

With the launch of PRISM, the payment system infrastructure of Pakistan achieved a major milestone during FY09, as the system minimizes the risks involved in large value transactions. SBP, along with the participants, is now working to streamline procedural activities like the discontinuation of paper instruments for executing inter-bank funds and securities' transactions. In so far as small value retail transactions are concerned, e-banking has grown significantly during the year. Banks are introducing innovative products by using their continuously improving infrastructure for e-banking. The number of online branches and ATMs during the year saw an increase of 758 and 878 respectively. While increasing e-banking activities contribute towards the operational efficiency of banks, SBP is endeavoring to create an enabling policy environment and containing overall risks associated with e-banking business.