12 PAYMENT AND SETTLEMENT SYSTEMS

As a key component of the financial infrastructure, an efficient payment and settlement system is indispensable to the functioning of a modern market based economy. Not only does a smoothly functioning payment system network reduce the cost of both real and financial transactions, it also helps in optimizing the use of limited financial resources by increasing the velocity of money, minimizing the occurrence of financial risks related to transactions, and strengthening the confidence of the general public in the financial system. An efficient payment and settlement system thus helps in fostering and maintaining financial stability and strengthening the conduct of monetary policy.

These considerations make the oversight of the payment system an essential function of a central bank. The State Bank of Pakistan (SBP), in its capacity as the central bank and the leading regulator of the financial sector, is responsible for the oversight of the payment system. Over the years, it has endeavored to ensure the smooth functioning of the payment and settlement system in the country, while continuing to upgrade its scope and capacity in response to the changing dynamics of the financial landscape.

Recent innovations in information technology have had a profound influence on the functioning of payment and settlement systems, as a result of which both their capacity and efficiency has increased manifold. While the numerous technological solutions developed by financial institutions are available for both retail and large value transactions, the advancements in the former are more visible to the public. In this backdrop, this chapter primarily focuses on the developments in Payment and Settlement Systems and their role in maintaining the stability of the financial system. The chapter is divided into five major sections namely: the evolution of the Payment and Settlement System in Pakistan; the legal framework on the basis of which it operates; developments in the retail payment system and e-banking; settlement of large value transactions on the PRISM platform; and settlement of foreign exchange (cross-border) transactions through SWIFT.

12.1 Evolution of Payment Systems

A payment system comprises of a set of payment instruments, banking procedures, standards, funds transfer systems and the technical means to facilitate funds transfer among economic agents for both financial and real transactions. In recognition of the crucial role of financial infrastructure in maintaining financial stability, the Committee of Payments and Settlement System (CPSS) of the Bank for International Settlement (BIS) issued the Core Principles for Systematically Important Payment Systems (SIPS) in January 2001, with the intention of promoting internationally accepted standards and practices for the design and operation of safe and efficient payment systems.[1] Under these principles, central banks are required to: (1) clearly define the scope and objectives of their payment system and publically disclose their role and policies in its oversight; (2) ensure compliance with the Core Principles; and (3) co-operate with other central banks, and any other domestic or foreign authorities, to improve the safety and efficiency of the payment system.

Over the years, SBP has also strived to modernize the payment infrastructure in the country. In doing so, it facilitated the establishment of the National Institutional Facilitation Technologies (Pvt) Limited (NIFT) for automated conventional clearing services (for instance, overnight

[1] Core Principles for Systematically Important Payment Systems, Committee on Payment and Settlement System, Bank for International Settlements, January 2001.

clearing, same-day high value clearing, inter-city clearing etc.). More importantly, the launch of the Pakistan Real-Time Interbank Settlement System (PRISM) on July 1 2008, which is owned and operated by the SBP, is a major achievement on this front. PRISM is a systemically important payment system and is designed to settle all large-value payments in the country.

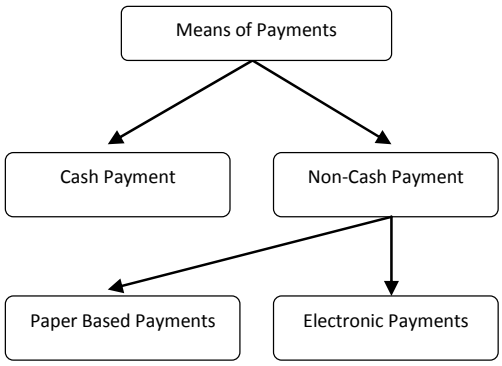
12.1.1 Legal Framework

SBP's oversight of the payment system is governed by the State Bank of Pakistan Act, 1956, and the recently promulgated Payment Systems and Electronic Funds Transfer Act, 2007 which provides the general legal framework for the functioning of the payment system in Pakistan. With the introductions of PRISM, efforts are underway to formulate operating rules which clearly define the relevant modalities for final settlement in the system.

12.2 Retail Payment System

The Retail payment system (RPS) in Pakistan comprises of both traditional and modern instruments for transacting payments. Generally, both cash and cheques are used, such that cash continues to be the preferred mode of payment for individuals, while cheques are used for commercial transactions. **Chart 12.1** shows the broad means of payments that can be used in any payment system to transfer funds. Cash payment is the most widely used means of payments to settle obligations in Pakistan. However, this mode of payment is costly due to problems related to manual counting, verification, and storage of physical currency notes.

Chart 12.1: Transfer of Funds

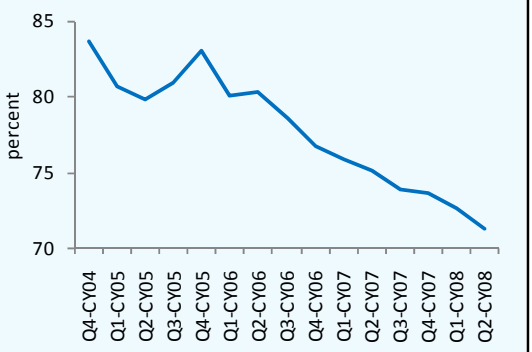


Non-cash payments are further categorized into paper-based and electronic instruments of payments. These non-cash payment instruments have undergone substantial changes since the mid 1990s. Some of the major developments are briefly discussed here to reflect the current position of the Retail Payment System in Pakistan.

12.2.1 Paper-Based Transactions and Clearing

An assessment of the share of paper-based transactions in the total number of retail transactions reveals that RPS in Pakistan is still dominated by traditional paper-based transactions (**Figure 12.1**). Both the volume and value of paper-based transactions is largely driven by cheques for cash withdrawals, and funds transfers through cheque-clearing. The share of all other paper based instruments (Pay Orders, Demand Drafts, Telegraphic Transfers etc.,) is less than 10.0 percent in terms of the total value and amount of paper-based transactions.

Figure 12.1: Share of Paper-based Retail Transactions



Source: SBP

A point worth noting in these statistics is the steady decline in the share of these transactions, which reflects a gradual transition from traditional paper-based RPS towards modern electronic instruments. In order to improve the efficiency of this traditional paper-based payment system,

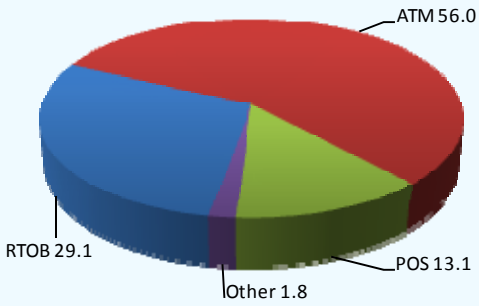
SBP facilitated a consortium of banks and a firm based in the private sector to set up a semi-automated clearing house namely the National Institutional Facilitation Technologies (NIFT), in 1995. NIFT offers four major clearing services including inter-city clearing, overnight clearing, same-day high value clearing and local USD clearing to all members in the major cities of Pakistan. The NIFT clearing system was recently upgraded to support the implementation of the Real-time Gross Settlement System at SBP.

The NIFT network currently serves over 4,500 branches of 40 banks (including SBP) in 100 major cities of Pakistan. As a result, the number of days required to settle payments made through paper-based instruments has reduced substantially. For instance, the USD clearing facility has reduced the clearing time for the USD denominated local cheques issued by foreign currency account (FCA) holders in Pakistan from three weeks to only four days. The reduced clearing time helps customers to optimize the use of their financial resources, which were previously blocked in the clearing process. In this way, NIFT continues to enhance the efficiency of its operations to improve the functioning of the paper-based payment system in Pakistan.

12.2.2 Electronic Transactions: E-Banking

A declining share of paper-based transactions in the total number of transactions in **Figure 12.1** is an indication of the increasing number of electronic transactions over the same period. This view is supported by the data on the quarterly volume of transactions which indicates that the number of electronic transactions has increased from 11.5 million in Q1-CY05 to 33.9 million by Q2-CY08: an increase of almost 3 times in just three and half years. Disaggregated data on electronic transactions reveals that all modes of electronic transactions have seen a significant rise in recent years, however the increase in ATM related transactions has outpaced the growth in the other modes. Specifically, ATM related transactions constitute over 50.0 percent of total electronic transactions (**Figure 12.2**).

Figure 12.2: Composition of Electronic Transactions- Q2 CY08



Source: SBP

A sharp increase in electronic transactions in recent years has been accompanied with an ongoing improvement in the e-banking infrastructure, and an increase in customer awareness. Trends in e-banking activities are briefly reviewed in the following discussion.

Real Time Online Banking (RTOB)

Since the late 1990s, commercial banks in Pakistan have been in the process of deploying automated financial services in the form of real-time online banking to customers, and have made substantial investments for introducing modern core banking solutions. These developments serve to improve the operational efficiency of the banking system.

At present, over 60.0 percent online branches of the banking system are offering RTOB including cash withdrawals, deposits and fund transfers. RTOB also facilitates the corporate sector in managing centralized accounts. Recent trends in the numbers and values of RTOB transactions depict significant growth in these activities (**Table 12.1**). Specifically, quarterly data on RTOB transactions shows that the number and value of such transactions at end-June CY08 has increased by 49.2 percent and 68.4 percent respectively over the past two years. Moreover, the average size of RTOB transactions is around Rs 400,000 at end-June CY08. The relatively large

size of the average transaction suggests that this mode of electronic transactions is primarily used to transfer funds by the small and medium sized businesses.

Table 12.1: Trends in Real Time On-line Banking

	CY06				CY07				CY08	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
No. of Transactions '000'	5763	6626	6284	7560	7941	8948	9071	8775	9121	9888
Amt. of Transactions 'Bln Rs'	2242	2399	2165	2375	2590	2961	3238	2915	3210	3954
Average Size of Trans. '000 Rs'	389.0	362.1	344.5	314.2	326.2	330.9	357.0	332.2	351.9	399.9

Source: SBP

ATM Network

Introduction of Automated Teller Machines (ATMs) during the late 1990s in Pakistan emerged as the most progressive development in e-banking. Due to the advancement in information technology, ATMs offer round the clock retail banking facilities including cash withdrawals, bill payments, mobile-phone top-ups, cheque book requests, mini account statements etc.

Since inception, ATM services have recorded tremendous growth in terms of both the number and value of transactions (**Table 12.2**). As of end-June CY08, the number of ATMs has reached 3,121 compared to only 206 as of end-December CY00. As all ATMs are linked through a centralized ATM Switch network, this helps customers in accessing their accounts through any ATM in the country. These facilities have led to a tremendous growth in ATM transactions which increased to 19.0 million during H1-CY08 compared to only 8.6 million during the corresponding period 3 three years ago: an increase of 2.2 times in just three years. The average size of ATM transactions, which is limited by the cap on single-day withdrawals imposed by banks, suggests that this mode of e-banking is primarily used for low value transactions including cash withdrawals, payment of utility bills etc.

Table 12.2: Trends in ATM Transactions

	CY06				CY07				CY08	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
No. of ATMs	1028	1612	1729	1948	2174	2294	2470	2618	3021	3121
No. of Transactions '000'	8902	10089	11418	12526	13174	14393	15999	16508	16385	19020
Amt. of Transactions 'Bln Rs'	53.2	60.8	70.3	77.7	80.1	88.2	104.1	109.5	109.9	129.5
Average Size of Trans. '000 Rs'	6.0	6.0	6.2	6.2	6.1	6.1	6.5	6.6	6.7	6.8

Source: SBP

Point of Sale (POS) Transactions

E-banking also facilitates customers to execute their payments through credit or debit cards. This is the third major source of electronic transactions in Pakistan with a share of around 15.0 percent in the total number of electronic transactions. As of end-June CY08, 55,853 point of sale terminals/machines are installed throughout the country.

Other Modes of E-banking

A number of banks in Pakistan also offer Internet and Mobile banking. Although the share of such types of transactions in overall e-banking transactions is quite limited at less than 2.0 percent, it is expected to increase in the near future due to increasing customer awareness.

12.3 Pakistan Real-Time Interbank Settlement System (PRISM)

A Real-time Gross Settlement (RTGS) system is one the most preferred mechanisms for the settlement of large value payments by central banks, as it is designed to achieve sound risk management in payment settlement, especially in the settlement of interbank transactions. In this system, payments are settled in real time across settlement accounts held at the central

bank. This instantaneous and continuous settlement of payments not only reduces systemic and credit risks in the interbank settlement process, but also allows the receiving bank the convenience to redeploy these funds if required. Importantly, smooth functioning of the RTGS system requires sufficient balances in participants' settlement accounts.

SBP, in its capacity as the final settlement agent for large value transactions in the interbank market, government securities' market and the eventual net settlement of the retail payment system, has moved from the traditional Net Settlement System[2] to a systemically important large-value electronic payment system named *Pakistan Real-time Inter-bank Settlement mechanism* (PRISM) with effect from July 1, 2008. PRISM started operations with the settlement of interbank money market transactions and the domestic leg of FX market operations. Since then, its capacity has been enhanced by introducing the settlement of interbank government securities' transactions and net settlement positions from retail clearing (NIFT) and bank cards clearing (ATM switch operators).

This system facilitates banks and financial institutions holdings accounts at SBP to operate their accounts in real time by using a computerized network. The real-time gross settlement of transactions can potentially create a temporary shortage of liquidity, which is catered for by an intra-day liquidity facility under a repo agreement. Banks can also change their payment priorities by using queuing facility available in the system. These features are expected to provide banks more control over their funds. Moreover, the Centralized Multilateral Net Settlement System[3] within the PRISM facilitates an efficient use of banks' liquidity by eliminating liquidity requirements for retail clearing in different current accounts maintained with the SBP BSC offices.

Besides risk management in payment systems, PRISM also facilitates connectivity with other regional and international payment systems for executing transactions related to foreign exchange, government securities/bonds, and settlement of equity investments. Over time, the system is expected to strengthen SBP's capabilities to conduct open market operations and to monitor inter-bank transactions.

12.4 SWIFT

In 1973, central banks of 10 industrialized countries established a secure communication system, i.e. the Society for worldwide Inter-bank Financial Telecommunication (SWIFT) in Belgium to facilitate cross-border transactions by financial institutions. The system operates a secure worldwide financial messaging network. As of June 2008, SWIFT connects over 8,000 financial institutions spread across 208 countries. The number of messages exchanged by this system is more than 15 million on a given day.

Historically, domestic banks in Pakistan used the Telex System to execute cross border transactions. The first Pakistani bank joined SWIFT in 1998, followed by SBP in the year 2000. At present, all banks in Pakistan use SWIFT facilities for their cross border transactions. SWIFT is also used for large value transactions and is the primary communication channel for cross-border transactions in Pakistan. The implementation of PRISM not only provides a low-cost interface for SWIFT connectivity to Pakistani banks, but also helps in minimizing risks in executing large value cross-border transactions.

[2] Under this system, SBP had issued cheque books to all banks maintaining current accounts with the central bank to meet their statutory liquidity requirements and to settle their large value interbank transactions. As part of this process, cheques were physically presented at SBP-BSC counters to settle payments. These cheques were processed by debiting the account of the remitting bank and crediting the accounts of beneficiary banks. The activity was completed by the end of the day.

[3] This system facilitates settlement of banks' accounts at the Karachi office. Earlier, settlement was taking place at all 16 field offices of the SBP BSC.

12.5 Impact on Risk Profile

These various developments clearly indicate that the Payment and Settlement System in Pakistan is still in the process of evolving in response to advancement in information technology and developments at the international and domestic front. While its capacity and efficiency has seen visible improvements in recent years, these changes have also impacted the associated nature of risks. This section gives a brief review of such risks.

In terms of benefits, e-banking facilitates customers by providing a wider range of options, more information and awareness, and faster and more competitive services. At the same time, it entails the risk of information overload, as customers at times do not fully comprehend the terms of reference of the facilities they subscribe for.

12.5.1 Operational Risk

E-banking generally tends to increase the complexity of banking activities, especially if banks offer creative and innovative products as opposed to the more traditional services. One of the key operational risks is related to the outsourcing of business functions for cost reduction due to lack of in-house expertise. This outsourcing may potentially lead to the partial loss of bank's control over that function. Similarly, e-banking brings more challenges to the forecast of business volumes.

12.5.2 Security Risk

It is generally believed that e-banking increases the security risks as banks' system are exposed to a more risky operating environment. The major types of security risks include: breaches with criminal intent; breaches by casual hackers; and loopholes in system design. All these breaches can have serious financial and legal implications.

12.5.3 Strategic Risk

Lack of a clear understanding of risks associated with e-banking activities among senior management may entail a strategic risk. Being relatively new, with a higher start-up cost, with different implications for early and late starters, e-banking activities can increase the institutions' strategic risks.

12.5.4 Reputational Risk

The decision to offer e-banking services can potentially increase reputational risk, as issues such as the failure to deliver promised services, difficulty in using e-banking services, frequency of service disruptions, theft of confidential customer information; fraud etc. can affect the confidence of customers. Moreover, rapid flow of information also entails reputational risk, especially if it serves to propagate an adverse development.

12.6 Conclusion

With the successful implementation of PRISM, SBP is now working in cooperation with all payment service providers and financial institutions to develop and promote standardization of relevant procedures, while also engaging in educational and awareness programs so that customers are better informed of the availability of new payment instruments and services. Some of these efforts have already been implemented with the introduction of detailed guidelines by SBP for: (1) Card-holders;[4] (2) Standardization of ATM-Operations; and (3) Operational guidelines for ATMs.

[4] PSD Guidelines for Account-holders using Credit/Debit/SMART cards available on www.sbp.org.pk