

Pakistan Real-time Interbank Settlement Mechanism (PRISM) has continued its upward trend in both volume and value in the wholesale transactions. At the same time, concentration risk in PRISM remains contained due to increased competition among banks. In the retail payment segment, besides paper-based transactions, the volume and value of e-banking transactions have surged depicting changing consumer preferences. SBP, cognizant of emerging cyber security risks, is putting in place adequate safeguards to protect the integrity of payment systems. Noteworthy improvement in operational risk associated with the functionality of Automated Teller Machines (ATMs) i.e. ATM downtime, has been observed. SBP is also taking steps towards enhanced oversight of the Systemically Important Payment Systems (SIPS), such as 1-Link and NIFT to mitigate systemic risk. The FMIs related to corporate securities trade and settlements remain resilient and continue to improve their risk management regime in order to ensure stable and efficient functioning of capital markets. Owing to increasing interconnectedness among the FMIs, the contagion risk, within the system, is also growing.

Financial market infrastructures (FMIs) are pivotal components of the financial system that facilitate the process of financial intermediation and maintain the trust of participants. They constitute critically important institutions, instruments and channels, which aid in the smooth flow of funds and securities. Therefore, soundness and efficiency of FMIs is crucial for the stability of the financial system.

FMIs broadly cover the Payment Systems, Central Securities Depositories (CSD), Securities Settlement Systems (SSS), Central Counter Parties (CCPs) and Trade Repositories.²⁶⁴ Pakistan's major FMIs include large value payment system (LVPS) i.e. Pakistan Real-Time Interbank Settlement Mechanism (PRISM); two interoperable inter-bank switches (1Link & M-Net²⁶⁵); one clearing house of paper based instruments (NIFT); one corporate securities settlement company (NCCPL); and one corporate securities depository company (CDC).

6.1 Payment Systems

Payment System Landscape and performance

SBP, by virtue of powers entrusted to it, plays the role of a regulator, operator and facilitator of country's payment and settlement systems. SBP in its "Vision 2020" has set, "Development of Modern and Robust Payment System" as one of its key strategic objectives. To achieve this goal, SBP is developing a National Payment System blueprint; modernizing the clearing and settlement infrastructure; enhancing security; and implementing a robust regulatory and supervisory framework for FMIs to improve their efficiency and ensure soundness.

Based on the quantum of values transacted, the country's payment system is divided into *Large Value Payment Systems (LVPS)* and *Retail Value Payment Systems (RVPS)*. The LVPS comprises of PRISM, which is used for both wholesale transactions of funds and securities between participants of PRISM and third party fund transfers, while RVPS is

²⁶⁴ FMI is defined as a multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling, or recording payments, securities, derivatives, or other financial transactions. Committee on Payment

and Settlement Systems of BIS, (2012). "Principles for Financial Market Infrastructures"

²⁶⁵ M-Net has recently initiated its winding up proceedings.

composed of various paper-based and electronic channels used for retail transactions.

Table 6.1

Profile of Payment System Mechanisms

Mechanism	CY13	CY14	CY15	CY16	CY17
(Volume in thousands and Value in PKR trillion)					
PRISM					
Volume	528.7	681.4	852.9	985.4	1,384.9
Value	146.9	156.6	224.5	238.1	336.9
Retail Payments					
Volume	719,916.3	800,426.8	857,383.3	962,610.7	1,161,655.1
Value	138.8	158.2	165.5	170.8	192.6
Paper based					
Volume	359,966.6	365,371.2	349,882.1	392,499.5	463,602.6
Value	107.1	123.2	129.2	134.1	152.0
E-Banking					
Volume	359,949.7	435,055.6	507,501.3	570,111.2	698,052.5
Value	31.7	35.0	36.4	36.8	40.6

Source: PSD, SBP

PRISM has been consistently growing in terms of both volumes and values. The retail segment is characterized by increasing volume of e-banking transactions, which points towards growing preference of electronic channels among banking customers.

PRISM has efficiently managed higher volume ...

During CY17, PRISM transactions have grown in both volume and value. In aggregate, it has settled 63.62 percent of total value of all payments, almost 10 times of GDP (**Table 6.1**). The daily average volume of settled transactions has grown to about 5400 (2016: 3800), while daily average value has increased to PKR 1,315 billion (2016: PKR 930 billion).

In contrast to moderate growth during CY16, the value and volume of PRISM transactions have grown by 41.46 percent and 40.54 percent,

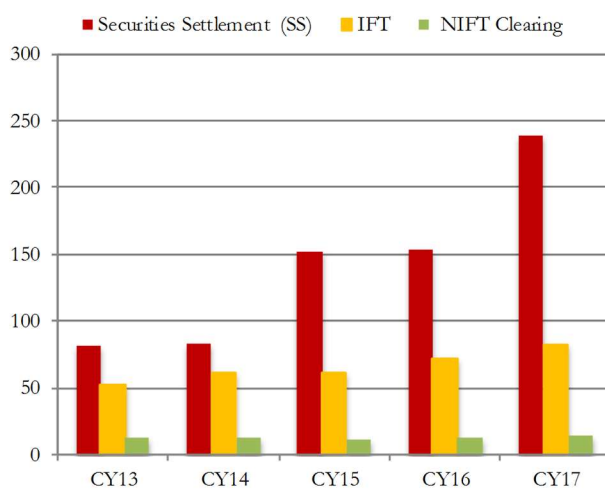
respectively, in CY17. The growth in value has primarily resulted from the growth in value of securities transactions (**Figure 6.1**), possibly due to increase in the quantum of open market operations (OMO) activity as well as banks' repo borrowings from SBP (see **Chapter 2**).

Figure 6.1

Value of PRISM transactions has increased

Components of PRISM

(Value in PKR trillions)



Source: PSD, SBP

Encouragingly, there is a noteworthy increase in the use of PRISM for Inter-bank Funds Transfers (IFT)²⁶⁶. The volume of IFT, which forms the major portion of PRISM transactions, has shown increase of 45.85 percent, while value has increased by 16.49 percent during CY17 (**Figure 6.2**). A major portion of volume of IFT transactions is comprised of third party fund transfers²⁶⁷. This is the result of continued efforts by SBP to raise awareness among customers for utilization of PRISM for efficient fund transfers. Moreover, under Pakistan Remittance Initiative (PRI), banks have been allowed to use PRISM free of charge for same-day settlement of domestic transfers of home remittances to their

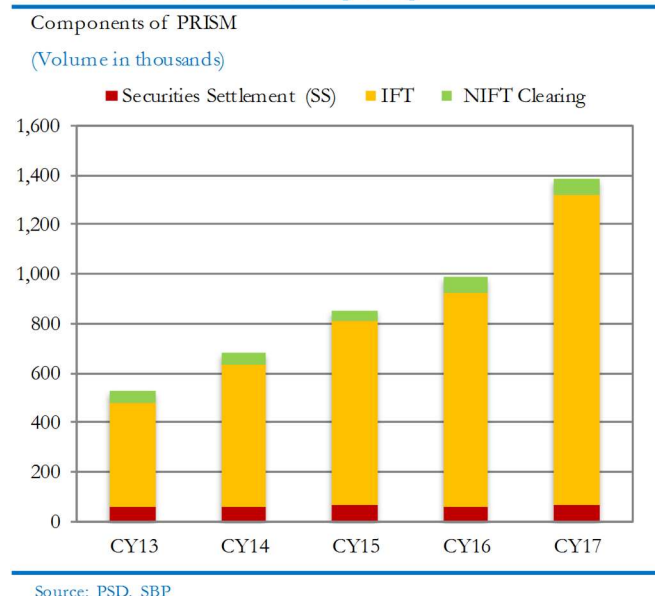
²⁶⁶ IFT transactions comprise of bank-to-bank transfers and third party customer transfers.

²⁶⁷ Third party fund transfers mean fund transfers processed via PRISM by direct participants on instructions of their customers/accountholders.

beneficiaries²⁶⁸, which have increased the volume of IFT transactions.

Figure 6.2

Volume of PRISM transactions is growing



Concentration of payments settled via PRISM is low ...

The analysis of payments settled among commercial banks through PRISM depicts that the concentration of payments remains low. The Herfindahl-Hirschman Index (HHI) for payments concentration among commercial banks averages around 0.06²⁶⁹ for CY17 (**Figure 6.3**), remaining close to its value in CY16. Thirty-one commercial banks are direct participants of PRISM²⁷⁰, out of which, seven banks, on average, account for 52.30 percent of the payments during CY17. These banks account for around 60.29 percent of the total banking sector's assets. The concentration of payments within these top seven banks also remains low. This is a reflection of limited monopolistic tendencies in the banking sector.²⁷¹ It implies that

²⁶⁸ PSD Circular Letter No. 04 of 2015; <http://www.sbp.org.pk/psd/2015/CL4.htm>

²⁶⁹ HHI value of less than 0.1 suggests low concentration.

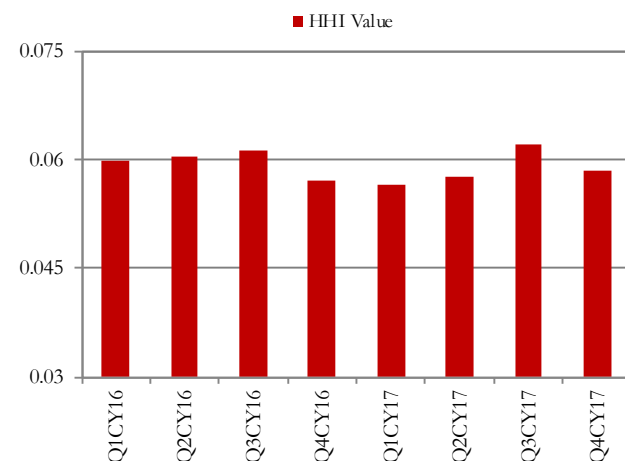
²⁷⁰ There are a total of 41 direct participants of PRISM. For the purpose of this analysis, only banks (excluding MFIs and DFIs) are considered.

the degree of substitutability in terms of payments settled through PRISM remains high, thus containing systemic risks in the event of a potential failure of any participant of PRISM.

Figure 6.3

Concentration Risk in PRISM remains low

Quarterly Concentration in Payments made through PRISM
(Index Value)



Disruption risk in PRISM remains low...

Owing to sufficient business recovery and resumption measures instituted by SBP to ensure continuity of operations, risks of disruption in PRISM remain limited. In order to ensure continuous availability of the system, SBP maintains business continuity and disaster recovery sites to be utilized in case of any interruptions in primary facility.

The scope of PRISM has been enhancing...

In addition to CDC, SBP has allowed National Clearing Company of Pakistan (NCCPL) to become

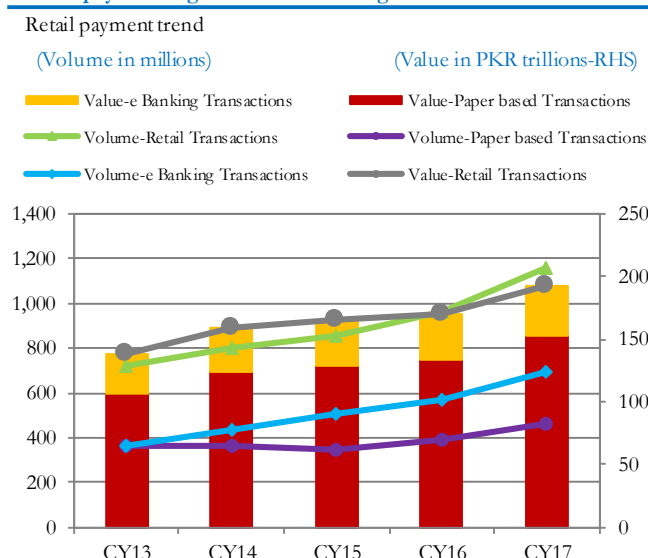
²⁷¹ Source: Khan and Hanif (2017): SBP Working Paper series no.92, "Measuring Competition in the Banking Sector of Pakistan: An Application of Boone Indicator" <http://www.sbp.org.pk/publications/wpapers/2017/wp90.pdf>

a special participant of PRISM to facilitate the efficient settlement of the capital market transactions.²⁷² As opposed to previous practice when the funds leg of the transactions was settled through various settlement banks, the trades will now be settled via PRISM, which will improve the efficiency of the process.

Moreover, the settlement risk associated with these transactions will be mitigated, as the settlement of National Clearing and Settlement System (NCSS) transactions will take place through the accounts maintained by banks with SBP. The availability of intra-day liquidity facility (ILF) for PRISM participants would also minimize the liquidity risk.

Figure 6.4

Retail payment segment shows robust growth



Source: PSD, SBP

The retail payment system shows robust growth...

The country's retail payment systems include paper-based and electronic modes of transactions. The overall volume of transactions have surged by 20.68 percent during CY17, while the value of these

transactions have gone up by 12.75 percent (**Figure 6.4**).

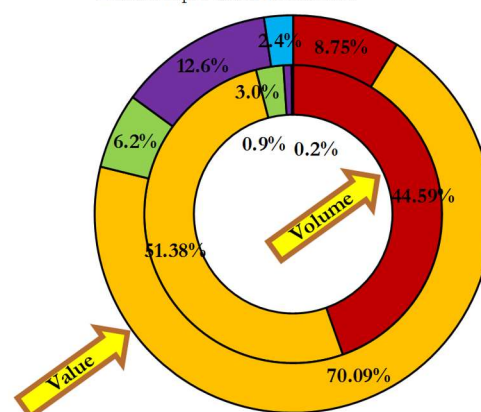
Figure 6.5

Cheques dominated paper based transactions

Volume and Value wise share of paper-based retail transactions during CY17

(Percent)

- OTC Cash Transactions
- Cheque Transactions
- Pay Orders/Demand Drafts/Banker's Cheques
- Direct Debit
- Other Paper-based Transactions



Source: PSD, SBP

Cheques dominate paper-based transactions...

Within retail payments, paper-based transactions have surged by 18.12 percent in volume and 13.40 percent in value, during CY17. Cheques remain the most preferred instruments as they accounted for 51.38 percent of the total volume and 70.09 percent of the total value of paper-based transactions (**Figure 6.5**). The lion's share, in volume, of these transactions pertains to cash withdrawals (51.11 percent). However, in terms of value, they have accounted for 11.65 percent of the total amount transacted (**Table 6.2**). A possible reason for withdrawal of smaller amounts through cheques may be that the customers are avoiding the cost associated with withholding tax on cash withdrawals.

²⁷² PSD Circular No. 1 of 2018;

<http://www.sbp.org.pk/psd/2018/C1.htm>

Table 6.2**Chequing Transactions in CY17**

Type	Number	Amount	Volume share	Value Share
	Million	PKR billion	Percent	
Cash Withdrawals	164.7	15,503.1	51.11	11.65
Transfers	103.8	86,481.8	32.23	64.97
Clearing	53.7	31,117.8	16.66	23.38

Source: PSD, SBP

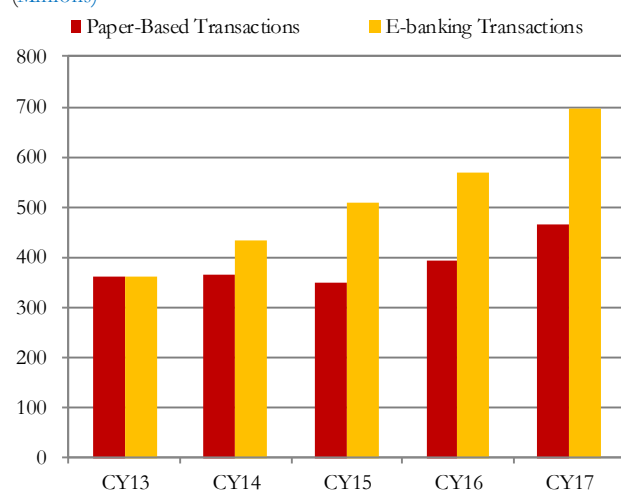
Non-cheque based Cash transactions remain low in value...

Non-cheque based cash transactions (such as Cash deposits, Utility Bill Payments etc.) in CY17 represent 44.59 percent of the total volume of paper based transactions; however, in terms of value they only represent 8.75 percent. This suggests that e-banking transactions are gradually gaining importance among the formal payment channels.

Figure 6.6**E-Banking transactions gaining traction**

Volume of Paper-Based and E-Banking Transactions

(Millions)



Source: PSD, SBP

E-banking transactions are gaining traction...

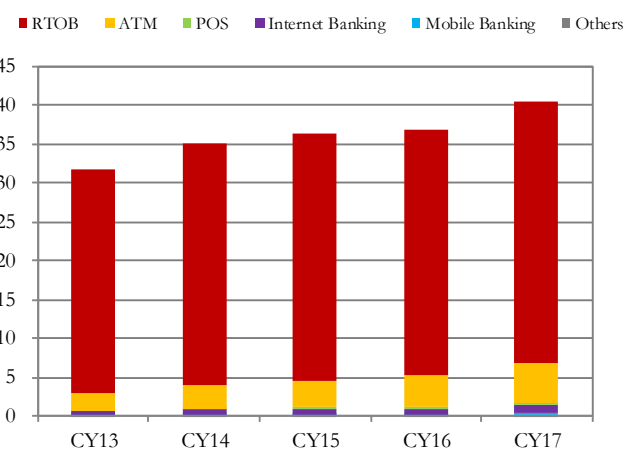
Electronic modes of funds transfer are gaining traction as depicted by increasing volume of e-banking transactions (**Figure 6.6**). The e-banking transactions have witnessed a growth of 22.44 percent in terms of volume and 10.35 percent in value. The growing volume suggests increasing preference of consumers towards electronic channels.

Among e-banking transactions in CY17, Real Time Online Banking (RTOB) transactions have accounted for 83.45 percent in value terms followed by ATM transactions (12.48 percent) (**Figure 6.7**).

Figure 6.7**E-Banking transactions' value increased in CY17**

Value of E-Banking Transactions

(PKR Trillions)



Source: PSD, SBP

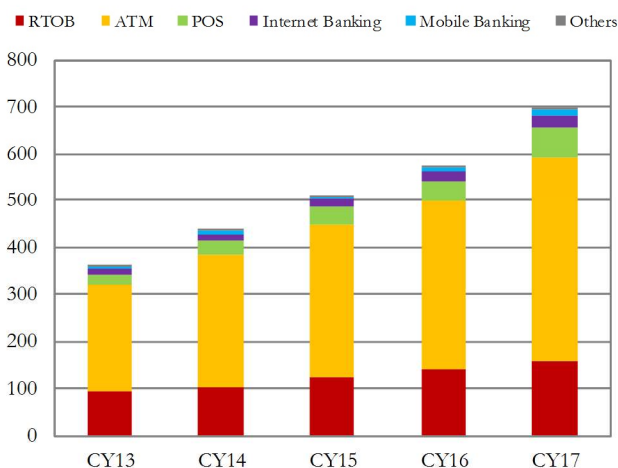
With respect to volume, ATMs lead with 62.67 percent share, followed by RTOB transactions having 22.35 percent share. The growing convenience and trust provided by internet and mobile channels are leading to a gradual decrease in share of RTOB transactions (**Figure 6.8**).

Figure 6.8

Volume of E-Banking transactions consistently increase

Volume of E-Banking Transactions

(In Millions)



Source: PSD, SBP

In order to cater to the shifting preference of banking customers towards electronic modes, the commercial and microfinance banks are also investing to expand their e-banking infrastructure and services as evident from the growth in Online Branches, Automated Teller Machines (ATMs) and Point-of-Sale (POS) machines during the past two years. Similarly, plastic cards have also witnessed expansion as depicted by growth in credit cards, debit cards and ATM only cards (**Table 6.3**).

PayPak making inroads...

In pursuance of SBP's Vision 2020 and National Financial Inclusion Strategy (NFIS), SBP launched the country's first domestic payment scheme i.e. PayPak in April 2016 which is operated by 1-Link. Its purpose is to provide the banking customers with low-cost, efficient and secure payment solution. Due to joint efforts by SBP and banking industry, around 500,000 cards have been issued by

16 banks, which points towards increasing adoption of PayPak by banks and customers.

Table 6.3

E-Banking Infrastructure Position at the end of Calendar

Description	CY13	CY14	CY15	CY16	CY17
	Number				
Online Branches	10,596	11,149	12,442	13,926	14,610
ATMs	7,684	9,018	10,736	12,352	13,409
POS	33,734	34,945	50,072	52,062	52,506
	Number in Thousands ('000)				
Total Payment Cards	22,380	25,994	32,744	36,202	39,361
of which:					
Credit Cards	1,336	1,332	1,394	1,209	1,374
Debit Cards*	20,048	23,727	26,489	17,470	19,848
ATM Only Cards	996	935	4,861	6,806	8,385
Social Welfare Cards	-	-	-	10,358	9,501
Pre-paid Cards	-	-	-	359	253

Source: PSD, SBP

* Prior to CY16, Debit cards also included social welfare and pre-paid cards.

Managing cyber security risk becomes paramount with increasing adoption of e-banking channels...

CY17 has witnessed a surge in the number of registered users of internet banking and mobile banking by 22.83 percent and 91.09 percent, respectively. Similarly, the use of electronic payment gateways for card-not-present (CNP) transactions²⁷³ on e-commerce platforms has been rising. Overall, the increasing use of electronic channels raises the probability of cyber-attacks and electronic frauds, which can potentially threaten the integrity of the banking system and undermine the confidence of the public. The rising number of payment card skimming incidents in the country also point towards the growing challenge of cyber-security.

²⁷³ Card-not-present transactions are those transactions, which are made when a consumer is not face-to face with the retailer or service provider – for example shopping online, by mail, or by phone.

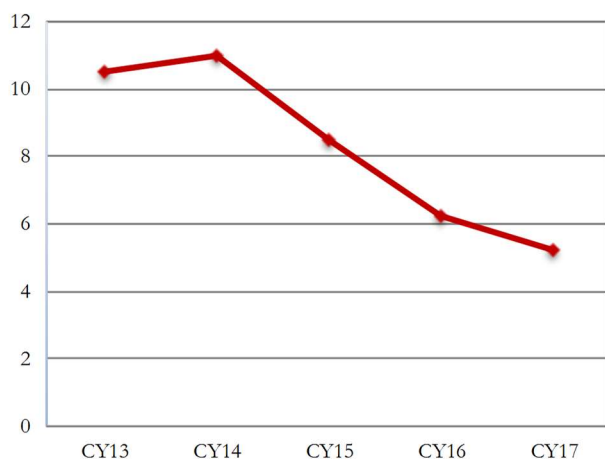
SBP, cognizant of these challenges, continues to develop and implement a robust regulatory and supervisory regime to ensure the safety of the payment systems (See Box 6.1).

Figure 6.9

ATM Efficiency has continuously improved

ATM Downtime

(Percent)



Source: PSD, SBP

Improvement in ATM efficiency signals lower operational risk...

Owing to the fact that ATM transactions occupy the most share in e-banking transactions, their efficient functioning and upkeep becomes critically important. As a medium of transactions which is designed to be available to customers round the clock, ATM downtime, due to bank's own system failure, poor connectivity, power outages and inadequate cash replenishment, especially during prolonged holidays, may lead to customer dissatisfaction and can create reputational risk.

Due to concerted efforts of the banking industry and improved surveillance by SBP, availability of ATMs has improved. Its uptime is on the increase

over the past few years, which further improved to about 95 percent during 2017 (**Figure 6.9**).

Settlement and liquidity risks in retail segment remain low...

Pakistan's retail payment system works on Deferred Net Settlement (DNS) basis i.e. on T+1 basis.²⁷⁴

This entails overnight credit risk as the transactions are settled on the next working day between the banks. To manage this risk, transfer limits have been imposed on per day basis both for retail and for corporate customers. Moreover, as these transactions are settled via PRISM, the availability of intra-day liquidity facility (ILF) mitigates the liquidity risk.

Branchless Banking serving as a catalyst for financial inclusion...

Branchless banking serves as a catalyst for financial inclusion and offers unprecedented opportunities to expand the outreach of financial services to the financially excluded populace. Currently, there are thirteen banks offering branchless banking services, which include four microfinance banks.

In CY17, the number of branchless banking accounts and deposits have surged by 86.63 percent and 80.41 percent, respectively. Similarly, the volume and value of branchless banking transactions have gone up by 647.6 million and PKR 2,804.0 billion, respectively (**Table 6.4**). This shows the growing confidence of customers in branchless banking as a convenient mode of payment.

Furthermore, to facilitate home remittances in a swift and cost effective manner, SBP has introduced a new category of Home Remittances Account (HRA) under the ambit of branchless banking regulations. HRA is a platform that will facilitate the country's low-income workforce to remit money

²⁷⁴ When IBFT transactions take place, payer and payee accounts are debited and credited, respectively, in real time (i.e. at time T), while

the back-end settlement between their banks takes place on the next working day (i.e. at time T+1).

back home to their families through formal channels without any hassle.

Table 6.4

Key Highlights of Branchless Banking

Description	CY16	CY17	Growth (percent)
No. of Agents	359,806.0	405,671.0	12.75
No. of Accounts (thousands)	19,964.9	37,260.2	86.63
Deposits as on period end (PKR million)	11,717.0	21,139.0	80.41
No. of Transactions during the period (millions)	478.5	647.6	35.35
Average No. of Transactions per Day (thousands)	1,329.1	1,877.9	41.29
Value of Transactions during period (PKR billion)	2,169.5	2,804.0	29.24
Average Size of Transactions (PKR)	4,539.2	4,317.3	(4.89)

Source: AC&MFD, SBP

In light of the increasing volume and value of transactions and outreach of branchless banking network, SBP has put in place a robust risk-based customer due diligence approach to ensure that the integrity of the branchless banking channels. Based on the category of account, the CDD requirements include verification of customer particulars from NADRA, biometric verification, transaction limits and maximum balance limits²⁷⁵.

SBP is encouraging PSOs/PSPs to improve the efficiency of payment systems...

PSOs and PSPs are mostly non-banking technology-based firms, which are changing the landscape of payment systems across the globe. They provide various services such as clearing, routing,

processing, switching and facilitating payments via electronic platforms. In doing so, besides competition to banks, they offer greater efficiency and customer convenience.

Pakistan's retail payment system is also witnessing an emergence of PSOs/PSPs such as payment aggregators, electronic wallets and e-commerce gateways. To encourage their growth whilst managing the risks associated with them, SBP has issued *Rules for Payment system Operators and Payment Service Providers*.²⁷⁶ These rules provide a robust and enabling regulatory framework, which requires the PSOs/PSPs to obtain an in-principal approval from SBP, consequent to which they are allowed pilot operations. These measures aim at ensuring availability of necessary risk mitigants and controls before final approval is given.

Managing Systemically Important Payment Systems (SIPS)...

Since payment systems fall at the heart of the process of financial intermediation, any disruption of processes or flaw in their design may lead to systemic implications, which may threaten the stability of the financial system.

In Pakistan's case, National Institutional Facilitation Technologies (NIFT), which is the sole clearinghouse for paper-based transactions, and 1-Link²⁷⁷ are of systemic importance. Similarly, with the emergence of various PSOs and PSPs, supervisory oversight is necessary for effective risk management of these entities.

Keeping this in view, SBP has issued a Payment System Designation Framework under section 4 of the Payment Systems and Electronic Fund Transfer Act, 2007.²⁷⁸ The framework allows SBP to

²⁷⁵ BPRD Circular No. 9 of 2016; <http://www.sbp.org.pk/bprd/2016/C9.htm>

²⁷⁶ PSD Circular No. 3 of 2014; <http://www.sbp.org.pk/psd/2014/C3.htm>

²⁷⁷ 1-Link operates the country's largest ATM switch and PayPak payment scheme, and conducts clearing of IBFT transactions.

²⁷⁸ PSD Circular No. 2 of 2017; <http://www.sbp.org.pk/psd/2017/C2.htm>

designate any payment system as SIPS, which would enable it to perform close supervision of these entities. Currently, SBP is working with market stakeholders to finalize the designation.

6.2 FMIs other than Payment Systems

During CY17, key FMIs operating in the corporate securities market such as Pakistan Stock Exchange (PSX), NCCPL and CDC have taken various initiatives to improve the operational efficiencies and strengthen risk management regimes.

PSX working to align its risk management regime with international best practices...

After the integration of three stock exchanges in January 2016, as per the Stock Exchanges Demutualization and Integration Act 2012, Pakistan's capital market is now comprised of one integrated stock exchange called Pakistan Stock Exchange Limited (PSX). Following this integration, 40 percent of the shares have been passed on to its members, 40 percent of shares offered to strategic investors and 20 percent to general public. As a part of this divestment plan, bidding for sale of 40 percent equity stake to a strategic investor was held in December 2016. Resultantly, the equity stake was offered to a Chinese consortium of three Chinese exchanges and two local financial institutions. The rest of 20 percent equity was offered to general public via an IPO in June, 2017.

With the completion of the divestment process, the ownership and management of PSX has been separated in line with international best practices. Moreover, a single stock exchange with strong risk management and investor protection mechanisms will be more efficient in attracting investors from

within and outside the country and achieve operational efficiency.

With the escalation of volatility witnessed during CY17, PSX is planning to further strengthen its risk management regime. Currently, scrip-level circuit-breakers are in place which avert panic selling or excessive buying that restricts or halts trading in a scrip if its price fluctuates by 5 percent or PKR 1/-, whichever is higher, compared to the closing price at the previous trading day.

However, PSX is now considering the widening of the circuit breakers in a phased manner. As per international best practices, the bourse is mulling over the implementation of index-based halts of 45 minutes for 5 percent fluctuation in KSE-30 index. The index-based halt would help in curtailing the generation of clearing house risk, allowing NCCPL to efficiently administer margins and collect marked-to-market (MTM) losses from clearing members. Moreover, it would provide the investors with a cooling-off period in order to assess the market.²⁷⁹

Assumption of Central Counter Party's role by NCCPL to mitigate credit and liquidity risks...

NCCPL is a key FMI of the country, dealing with settlement of trades in the corporate securities market. With the assumption of role of Central Counter Party (CCP)²⁸⁰ in May 2016, NCCPL has become a systemically important FMI, responsible for mitigating systemic risk arising from the settlement of capital market transactions. Accordingly, it has taken various measures to strengthen its risk management regime as per international best practices prescribed by

²⁷⁹ PSX Notices;

<https://www.psx.com.pk/newsimage/107217-1.pdf>

²⁸⁰ 'CCPs' have multiple roles in its central clearing function. They set standards for clearing members, ensure netting of trades and the orderly close out of positions in a member's default scenario, maintain

margin, maintain a default fund for loss mutualization (i.e. risk sharing), make margin calls, and carry out trade settlement'. Global Association of Risk Professionals (GARP) Schweser Notes, 2016, FRM: Financial Markets and Products, Kaplan Inc. USA

International Organization of Securities Commission (IOSCO).

As explained earlier, the efficiency of capital market transactions will increase with NCCPL's inclusion as a special participant of PRISM. Instead of settlement of NCSS transactions through multiple settlement banks, NCCPL will now prepare multilateral net settlement batches (MNSBs) twice a day on the SWIFT message format and submit the same to SBP for settlement through PRISM²⁸¹.

In order to manage the default risk, NCCPL has established a Settlement Guarantee Fund (SGF) as per NCCPL regulations, which was initially valued at PKR 2.75 billion.²⁸² During February 2017, PKR 9.9 million was utilized from the fund owing to failure of a clearing member and was replenished within the same month. The gradual enhancement of SGF continues and stands at PKR 3.08 billion at end of December, 2017²⁸³.

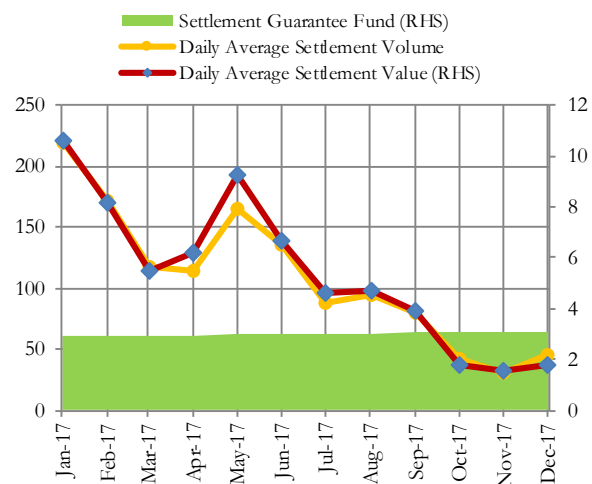
While NCCPL continues to manage the settlement efficiently, the average daily settlement value has decreased significantly from PKR 8.1 billion in the first quarter of CY17 to PKR 1.7 billion during the last quarter because of bearish trend in the market and subdued trading activity. However, the daily average settlement value for the whole year stands at PKR 5.4 billion, which is greater than the size of the SGF (**Figure 6.10**). Although in case of failure of a clearing member, the first line of defense is the margins provided by the clearing member, a systemic event in the stock market may require SGF.

Going forward, when the volume of trade surges back to its usual level, the average daily settlement values may increase, rendering the SGF deficient in

case of a systemic event. Hence, SGF needs to be enhanced further to mitigate the settlement risk.

Figure 6.10
Comparison of Settlement Guarantee Fund with Daily Average of Settlement Value

(Volume in Millions) (Value in PKR Billions)



Source: NCCPL.

NCCPL strengthening its risk management regime...

After the promulgation of Securities Act, 2015, and the assumption of the role of CCP, NCCPL has introduced various changes in its risk management regime. Some of these changes include a 10 percent increase in value-at-risk (VaR) margins and haircuts for ready and deliverable futures market and revision in features of the Securities Lending and Borrowing (SLB) scheme, Margin Financing Scheme (MFS) and Margin Trading Scheme (MTS)²⁸⁴.

To mitigate operational risk, NCCPL has launched a Two-Factor Authentication feature and Completely Automated Public Turing test to tell Computers and Humans Apart (CAPTCHA) to improve security of the web-based portals, used by investors to track their trading activity in NCSS.

²⁸¹ PSD Circular No. 1 of 2018;
<http://www.sbp.org.pk/psd/2018/C1.htm>

²⁸² NCCPL's Annual Report, 2016

²⁸³ NCCPL's Annual Report, 2017

²⁸⁴ NCCPL's Newsletter, January-March, 2017

The NCCPL has also secured the ISO22301 certification, related to business continuity management, awarded by SGS Pakistan.²⁸⁵ This depicts the preparedness and resilience of NCCPL in the face of any disaster, thus ensuring that any disaster does not disrupt the smooth functioning of the capital market.

Central Depository Company (CDC) continues to hold the trust of the general public...

CDC is another key FMI that serves as the sole corporate central securities depository (CSD) of the country. It manages and operates the Central Depository System (CDS), which is an electronic book-entry system used to record and maintain securities and register their transfers, in order to manage custodial risk. Hence, CDC is an important facilitator of the corporate securities market, enabling smooth trading of securities in the capital market.

CDC continues to hold the trust of the public as evident from the increasing number of investor accounts, which stood at 52,180 as of end CY17. The CDS handled a total of 128 billion shares with a market capitalization of PKR 5.129 trillion²⁸⁶ at the end of CY17.

The most crucial risk associated with any CSD is the asset safety risk, which involves the loss or misappropriation of securities due to omission, misuse and breakdown of controls. Therefore, in order to facilitate and protect the investors, CDC has launched MAccess—CDC Access Mobile Application—that offers the investors the convenience of managing their accounts through their mobile phones, thus garnering their trust.

Furthermore, CDC has also launched the Centralized e-IPO system (CES), enabling the investors to subscribe shares electronically through internet/mobile banking, ATMs etc.²⁸⁷

As per the provisions of the Companies Act 2017, which require all listed companies to process their dividends electronically, CDC has launched the eDividend Repository—an internet-based web portal—which allows investors a single-point access to track the returns on their investments and unclaimed dividends.²⁸⁸ Further, in compliance with the provision of the Act, and to mitigate the operational risk associated with payment of dividends, CDC has made it mandatory for all capital market investors to provide their International Bank Account Number (IBAN) as part of the registration details for opening and maintaining sub-account in CDS.²⁸⁹ The increasing adoption of technologies by CDC not only provides convenience to the investors but also mitigates the asset safety risk by ensuring more transparency to the investors.

Moreover, to cater to the risk of operational disruption in the face of any untoward incident, CDC has ensured that adequate contingency plans are in place. In March 2017, it became Pakistan's first ISO 22301 certified company for its Business Continuity Management Program.²⁹⁰

Increasing use of technology and interconnectedness among FMIs needs a close watch

Interconnectedness among the country's various FMIs is increasing gradually. Today, CDC, NIFT and NCCPL are participants of PRISM. While the rising interconnectedness is leading towards efficiency gains, it also raises the likelihood and

²⁸⁵ NCCPL's Newsletters, January-December, 2017

²⁸⁶ CDC's Newsletter, October-December 2017

²⁸⁷ CDC's Newsletter, April-June 2017

²⁸⁸ CDC's Newsletter, October-December 2017

²⁸⁹ CDC's Newsletter, July-September 2017

²⁹⁰ CDC's Newsletter, January-March 2017

impact of contagion risk in case of a system-wide distressed scenario.

Going forward, management of this risk requires further strengthening of the entity-level risk management regimes in FMIs along with increasing collaboration between the regulators (SBP & SECP). In this regard, SBP and SECP have signed a letter of understanding (LOU) in May 2017 to establish a Council of Regulators (CoR) to enhance their collaboration in order to ensure the stability of the country's financial system. This forum will prove to be effective in terms of managing risks associated with increasing interconnectedness among the country's financial institutions as well as FMIs.

Box 6.1: Emerging challenge of Cyber Attacks- Implications for financial sector

Today, cyber-attacks are characterized by an increase in sophistication, potential for disruption and global prevalence. The World Economic Forum Global Risk Perception Survey 2018 cited the risk of cyber-attacks as one of the top 10 risks in terms of both impact and likelihood. The overall cost of cyber-attacks is predicted to be USD 8 trillion over the next five years. Noteworthy examples of cyber-attacks during CY17 are the WannaCry ransom ware attack during May 2017, which affected more than 300,000 computers across 150 countries²⁹¹ and the Petya ransom ware attack, which targeted various large organizations across the globe. The threat of cyber-attacks is a disruptive cross-border phenomenon, which merits urgent global efforts.

The global financial system is not aloof of cyber security risk. The cyber-heist on Bangladesh Bank in 2016, which resulted in a loss of USD 81 million, is one of the notable examples from the recent past. As more and more financial institutions continue to leverage information technology to offer efficient and innovative services and products, technology becomes an integral part of their business models and operations. Consequently, it entails greater investment in cyber-security architecture and a robust regulatory and supervisory regime to ensure smooth functioning of payment and settlement systems to hold the trust of the general populace.

The emergence of cyber-security risks, which now pose a challenge of systemic proportions, is driven by a host of factors. These include the widespread use of technology, both by financial institutions and consumers, growing interconnectedness among financial institutions through the use of technology-based platforms, increasing reliance on data and the evolving nature and sophistication of cyber-attacks. Moreover, as financial institutions continue to adopt the evolving technologies, their dependence on technology firms for emerging services like cloud computing firms, FinTech platforms,

etc. increases. Since these firms, generally, fall outside the perimeter of the financial regulators, the oversight of cyber-risks becomes a challenge.

The key risks associated with cyber-attacks, which compromise the integrity of the financial system, include:

- Breaches of data security/privacy resulting in financial losses,
- Vulnerability of IT systems to malicious viruses such as ransom wares,
- Disruption in IT systems of financial institutions leading to a halt in operations,
- Vulnerability of IT based financial solutions such as ATMs, internet banking and mobile banking to frauds such as skimming, phishing, pharming etc.,
- Reputational loss for financial institutions which may have systemic implications, and
- Vulnerability of national and cross-border payment and settlement systems which may pose contagion risk,

International bodies are making concentrated efforts towards addressing the issue affecting the cyber-resilience in the global financial system. The Committee for Payments and Markets Infrastructure (CPMI) and International Organization for Securities Commissions (IOSCO) have issued Principles for Financial Markets Infrastructures (PFMIs) which comprehensively deal with the risk management of financial market infrastructures²⁹². Building on that, CPMI-IOSCO issued guidelines on cyber-resilience for financial market infrastructures which aims at improving cyber-governance, preparedness in case of a cyber-attack, threat intelligence and awareness among end-users. Similarly, the G7 published the “fundamental elements of cyber security for the financial sector”, which outlines various elements to serve as building blocks upon which an entity can design and implement its cyber-security strategy²⁹³.

The results of the 1st wave of SBP Systemic Risk Survey depict that cyber security risk stands among the top 10

²⁹¹ The Global Risks Report, 2018 (*World Economic Forum*)

²⁹² Principle 17 of PFMIs deals with operational risks related to functioning of financial market infrastructures.

²⁹³ https://www.ecb.europa.eu/paym/pol/shared/pdf/G7_Fundamental_Elements_Oct_2016.pdf?69e99441d6f2f131719a9cada3ca56a5

risks facing Pakistan's financial system (**See SRS Results in Box:1 in Executive Summary**). However, the level of cyber security risk to Pakistan's financial sector remains within tolerable bounds. The industry has not seen any significant disruption in functioning of the payment and settlement systems, which has maintained the confidence of the participants.

State Bank of Pakistan (SBP), being the supervisor and regulator of the banking sector and payment systems, has long been cognizant of the growing threat of cyber security risk and is continuously working in close coordination with the banks to ensure cyber readiness.

In this regard, SBP has issued *the Framework for Risk Management in Outsourcing Arrangements by Financial Institutions* which addresses the risk emanating from reliance of banks on third party service providers²⁹⁴. The SBP has detailed set of instruction on *Prevention against cyber-attacks, in terms of which* banks are required to continuously enhance their cyber security controls, processes and procedures in order to anticipate, withstand, detect, and respond to cyber attacks. For the purpose, banks need to formulate cyber security controls as an integral part of their IT risk management policy, accompanied by appropriate Standard Operating Procedures to safeguard against potential cyber threats²⁹⁵.

To ensure that the payment cards in the country are secure, SBP has issued *Regulations for Payment Cards security* to facilitate the card service providers (CSPs) to develop a card security framework according to international best practices. The regulations require all cards to be issued in compliance with the Europay, Mastercard and Visa (EMV) standard from June 30, 2018 onwards, to protect the consumers from frauds such as skimming²⁹⁶.

To protect the increasing consumer base using internet banking channels, SBP has issued *Regulations for the Security of Internet Banking* requiring banks to develop a comprehensive internet banking security framework²⁹⁷. The regulations emphasize on customer awareness by the

banks about identity theft and fraud techniques as part of the preventive controls.

To cater to cyber security risk, Government of Pakistan has also taken various initiatives. The legal framework against cyber crimes was strengthened through promulgation of Prevention of Electronic Crimes Act, 2016. The legislation outlines a mechanism for investigation, prosecution and trial related to electronic crimes such as cyber-attacks. On the institutional front, a National Response Center for Cyber Crime (NR3C) is working under the Federal Investigation Agency with a mandate to deal with technology based crimes.

Cyber-security challenges for the financial sector need urgent attention of the global community. As the first line of defense, awareness among the human resources of financial institutions and end-consumers of financial services must be enhanced. Moreover, regulators must work closely with financial institutions to ensure that adequate safeguards are in place to defend against the cyber-attacks. Most importantly, owing to the cross-border nature of cyber-attacks, international collaboration between states, supervisory bodies, law enforcement agencies and financial institutions is pivotal to manage and mitigate the risks associated with these attacks.

²⁹⁴ BPRD Circular No. 06 of 2017;
<http://www.sbp.org.pk/bprd/2017/C6.htm>

²⁹⁵ BPRD Circular No. 07 of 2016;
<http://www.sbp.org.pk/bprd/2016/C7.htm>

²⁹⁶ PSD Circular No. 05 of 2016;
<http://www.sbp.org.pk/psd/2016/C5.htm>

²⁹⁷ PSD Circular No. 03 of 2015;
<http://www.sbp.org.pk/psd/2015/C3.htm>