

5 Soundness and Efficiency of Financial Market Infrastructure

Pakistan Real-time Interbank Settlement Mechanism (PRISM) has continued its consistent trend of growth both in volumes and values in whole-sale; while in retail segment, paper based transactions showed a dip by almost similar fraction by which e-banking transactions have gone-up. Notably, Operational risk attached to the functionality of Automated Teller Machines (ATMs) i.e. ATM downtime, has shown some improvements. The growing interconnectedness of various Financial Market Infrastructures (FMIs), though beneficial from efficiency point of view, raises systemic risk concerns going forward. In CY16, a couple of major events took place that are expected to contribute towards soundness and efficiency of the FMI: a) Integration of the three Stock Exchanges to form a single one i.e. Pakistan Stock Exchange (PSX) which could bring technological advancement and operational effectiveness, and b) National Clearing Company of Pakistan Limited (NCCPL) assuming the role of a Central Counter Party (CCP) that could help mitigate credit and liquidity risks. Financial Technology (FinTech) has emerged as the new phenomenon in the FMI landscape. To reap its full potential in making payment and other financial services efficient and less costly, besides encouragement, there is a need to tackle the full spectrum of risks associated with the nascent FinTech sector.

Financial Market infrastructure (FMI) plays a critical role in the smooth functioning of the real economy, maintaining financial stability and improving monetary transmission mechanism, thus promoting economic growth. It covers the Payment Systems, Central Securities Depositories (CSD), Securities Settlement Systems (SSS), Central Counter Parties (CCP) and Trade Repositories.¹⁹⁸

The FMI of Pakistan has been facilitating the government, businesses and individuals in discharging their financial obligations effectively and efficiently. The major FMIs of the country include multi-dimensional Large Value Payment System (LVPS) i.e. Pakistan Real-Time Interbank Settlement Mechanism (PRISM); two interoperable inter-bank switches (1Link & M-Net); one clearing house of paper based payment instruments (NIFT); one corporate securities settlement company (NCCPL); and one corporate securities depository

company (CDC). A functional overview of the key FMIs of Pakistan are given in **Box 5.1**.

Payment System Landscape and performance

SBP, being the central bank of the country, has a strong interest in the smooth functioning of the **payment and settlement systems**. To enhance focus on this area, SBP has identified “Development of Modern and Robust Payment System” as one of the key objectives under its strategic plan “Vision 2020”. SBP is playing its role not only in development of national payment systems but also through oversight, regulation, operation and facilitation of the market (**see SBP’s detail roles in Box 5.1**) for achieving the public policy objectives of soundness and efficiency of financial market infrastructure.

The performance of payment systems remained persistent with the previous years. PRISM is consistently growing both in terms of volumes and values. In retail segment, paper based transactions have seen considerable decline while e-banking transactions have maintained steady growth, showing customers’ changing preferences.

¹⁹⁸ 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”

PRISM efficiently managed higher volume of LVPS...

In CY16, value and volume of transactions settled through the PRISM continued to rise, though at a slower pace. The PRISM has settled 59.14 percent of total value of all payments that is almost 8 times of the GDP (**Table 5.1**). The daily average volume of settled transaction has grown to about 3800 (2015: 3300) while daily average value increased to about PKR 930 billion (2015: PKR 876 billion).

Table 5.1

Profile of Payment System Mechanisms

Mechanism	CY12	CY13	CY14	CY15	CY16
(Volume in thousands and Value in PKR trillion)					
PRISM					
Volume	430.8	528.7	681.4	852.9	985.4
Value	137.6	146.9	156.6	224.5	238.1
Retail Payments					
Volume	656,529.9	719,916.3	800,426.8	857,383.3	868,603.9
Value	130.8	138.8	158.2	165.5	164.5
Paper based					
Volume	360,547.9	359,966.6	365,371.2	349,882.1	298,492.7
Value	103.4	107.1	123.2	129.2	127.8
E-Banking					
Volume	295,982.0	359,949.7	435,055.6	507,501.3	570,111.2
Value	27.4	31.7	35.0	36.4	36.8

Source: PSD, SBP

Note: The figures of CY16 are provisional.

The growth in value and volume of PRISM transactions has moderated during CY16 compared to last few years. This has largely resulted from slowdown in government securities settlement transaction following partial shift in government borrowing to SBP that led to decrease in the OMOs activity and banks repo borrowings from the SBP (see **Chapter 2**).

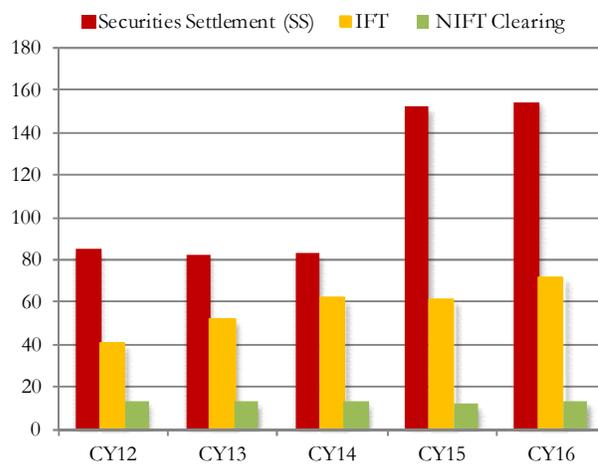
Use of PRISM for Interbank Fund transfers (IFT) activity has seen healthy growth over the year. The volume of IFT, which forms the major portion of PRISM transactions, has shown increase of 16.77 percent, while value increased by 16.67 percent (**Figure 5.1 & 5.2**).

Figure 5.1

Value of PRISM transactions increased

Components of PRISM

(Value in PKR Trillion)



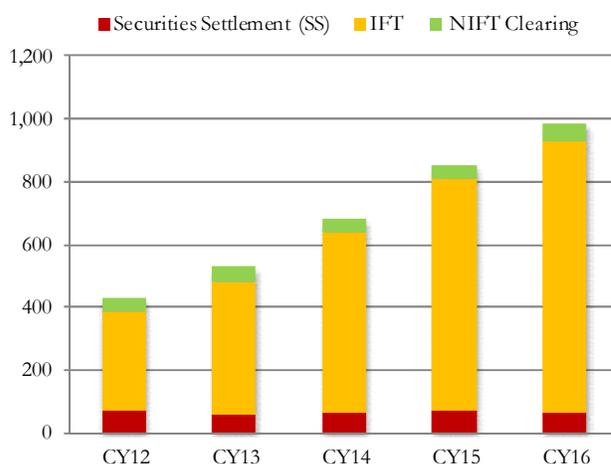
Source: PSD, SBP

Figure 5.2

Number of PRISM transactions show uphill trend

Components of PRISM

(Volume in thousand)



Source: PSD, SBP

Enhanced use of PRISM for IFT has, among other things, resulted from continuing SBP efforts to encourage it for efficient payments. To this end, SBP has allowed the third party fund transfers facility to bank account holders through PRISM and advised banks to create awareness among their customers for utilization of PRISM for efficient

funds transfers. Further, banks have been allowed to use PRISM system free of charge for same day Inter-Bank domestic transfer of Home Remittances to their beneficiaries, under Pakistan Remittance Initiative (PRI) arrangement¹⁹⁹.

Large Value Payment System – PRISM – remained resilient...

Reliable and resilient LVPS acts as the catalyst for growth in the financial system. The PRISM maintained high level of system availability during the years. To ensure continuous availability of the PRISM and resilience against any operational disruption, SBP has put in place effective backup arrangements including disaster recovery centre that can be used in the event primary site is down.

SBP focusing on improving PRISM efficiency...

As discussed earlier, PRISM has efficiently managed the increasing number of large value payments. In line with its continuing efforts for enhancing the efficiency in settlement of large value payments, SBP implemented Straight Through Processing (STP) early in 2016 for electronically integrating participants' core banking system with PRISM. While STP will optimize the transaction processing, it will also facilitate in reducing processing cycles, elimination of manual entry, reducing chances of errors and conducting transactions at branch level.

SBP has allowed CDC as a direct participant of PRISM, while some banks are performing as settlement banks in National Clearing & Settlement System (NCSS) through PRISM (**For details see Box 5.1**). These arrangements have facilitated seamless large value fund transfers among key stakeholders. Further, to facilitate the investors, Central Directorate of National Savings (CDNS) has been allowed direct membership of NIFT to clear

and settle the profit coupons and withdrawals slips of their investors.

Pakistan's retail payment system is also fast...

While PRISM works on real time settlement basis, the country's retail payment system works on Deferred Net Settlement (DNS) basis which is also considered fast. It is settled on T+1 basis: when Inter Bank Fund Transfer (IBFT) transaction takes place, payer and payees accounts are debited and credited respectively in real time (i.e. at time T), while back-end settlement between their banks takes place on the next working day (i.e. at time T+1).

The overnight credit risk during the said process is managed by imposing maximum transfer limit of PKR 0.25 million per account per day. Since, per transaction and overall daily quantum of exposure is not very high, adequate liquidity is maintained in the banks' accounts with SBP accordingly in the wake of emerging liabilities.

E-banking transactions are replacing paper-based transactions in retail segment...

During CY16, the total retail payment transactions moderated as compared to last year, both in terms of value and volume, mainly due to shrinking paper based transactions (**Figure 5.3**). The paper based transactions have decreased in CY16 – 14.69 percent down in volume and 1.06 percent in value, while e-banking transactions have increased – 12.34 percent up in volume and 1.05 percent in value. This indicates a shift in customer's preference towards e-banking due to its efficiency and ease of use.

Cheques dominate paper based transactions...

In paper based transactions, Cheques are the preferred instruments followed by pay orders/ demand draft/ bankers cheques (**Figure 5.4**).

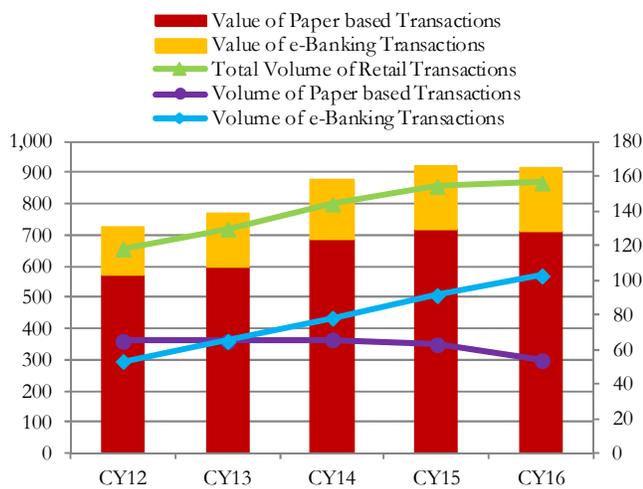
¹⁹⁹ PSD Circular Letter No. 03 of 2016;
<http://www.sbp.org.pk/psd/2016/CL3.htm>

Figure 5.3

Retail payment growth trend consistent with previous year

Retail payment trend

(Volume in million) (Value in PKR trillion)

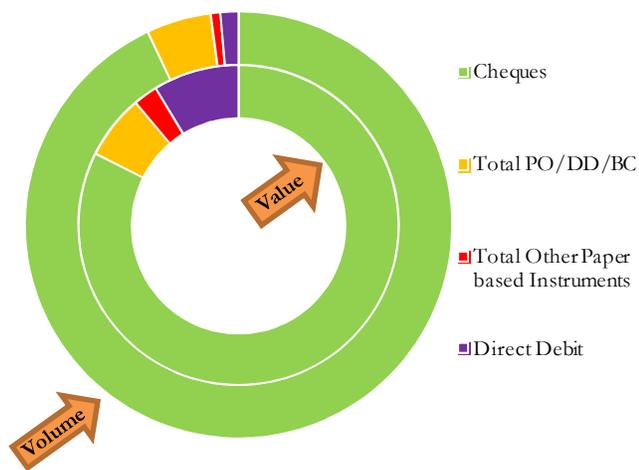


Source: PSD, SBP

Figure 5.4

Cheques dominated paper based transactions

Volume and Value wise share of paper-based retail transactions during CY16



Source: PSD, SBP

Within the cheque based transactions in CY16, the volume of instruments used for cash withdrawal has remained the highest but the amount of withdrawal the lowest (Table 5.2). It seems that customers are using a large number of small denomination cheques for cash withdrawal – may be to avoid withholding tax – while large value transactions are being settled via Transfers and Clearing where no

withholding tax is applicable on tax filers (Table 5.2).

Table 5.2

Chequing Transactions in CY16

Type	Number (Million)	Amount (PKR Billion)	Volume share (percent)	Value Share (percent)
Cash	158.1	15,231.3	56.95	14.47
Transfer	66.7	65,202.6	24.03	61.94
Clearing	52.8	24,841.0	19.03	23.60

Source: PSD, SBP

The banks have enriched e-banking services and infrastructure...

The commercial and microfinance banks are expanding e-banking services and have enriched infrastructure to accommodate changing preferences of the customers towards the use of technology (Table 5.3).

Table 5.3

Banks offering E-Banking Services

Description	Number as of	
	31-12-16	31-12-15
Banks providing internet banking	23	21
Banks providing mobile phone banking (through SMS/ Mobile App)	18	16
Banks providing call center/ IVR banking	16	16
Banks issuing credit cards	12	12
Banks issuing debit cards	28	28
Banks issuing ATM only cards	18	13
Banks issuing social welfare cards*	8	-
Banks issuing prepaid cards*	4	-
Banks having own ATMs	32	32
Banks acquiring POSs	6	6

Source: PSD, SBP

* Social welfare & pre-paid cards are special type of debit cards which are not directly linked with bank accounts, and were not reported separately prior to CY16.

E-banking infrastructure shows steady growth in CY16 in terms of Online Branches, Automated

Teller Machines (ATMs) and Point of Sales (POS) network in line with previous years. Plastic cards also witnessed expansion except credit cards, which declined due to probable cancellation by some of the banks on account of prolonged inactivity by the customers (**Table 5.4**).

Table 5.4

E-Banking Infrastructure Position at the end of Calendar Years

Description	CY12	CY13	CY14	CY15	CY16
Online Branches	9,896	10,596	11,149	12,442	13,926
ATMs	6,232	7,684	9,018	10,736	12,352
POS	34,724	33,734	34,945	50,072	52,062
Total Payment Cards (000)	20,717	22,380	25,994	32,744	36,202
of which:					
Credit Cards (000)	1,271	1,336	1,332	1,394	1,209
Debit Cards* (000)	18,572	20,048	23,727	26,489	17,470
ATM Only Cards (000)	874	996	935	4,861	6,806
Social Welfare Cards (000)	-	-	-	-	10,358
Pre-paid Cards (000)	-	-	-	-	359

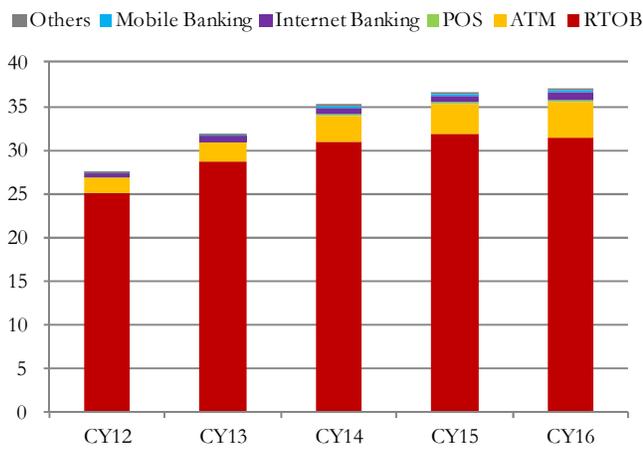
Source: PSD, SBP

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

Figure 5.5

E-Banking transactions' value inched up in CY16

Value of E-Banking Transactions
(PKR Trillion)



Source: PSD, SBP

E-banking transactions' growth is decelerating...

Among e-banking transactions in CY16, Real Time Online Banking (RTOB) transactions have accounted for 85.70 percent in value terms followed

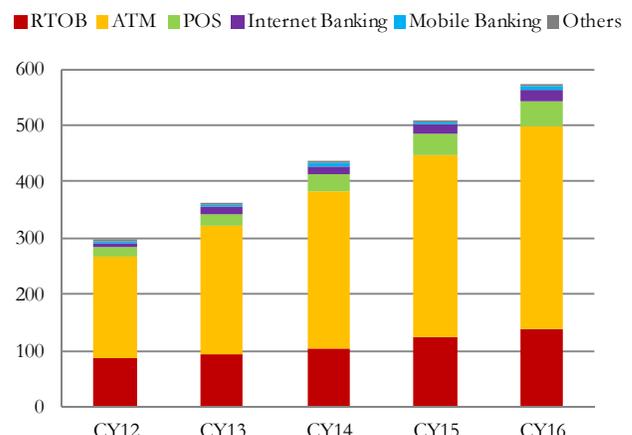
by ATM transactions of 10.92 percent. E-banking transactions have been observing healthy growth till CY14, but thereafter the growth has tapered off (**Figure 5.5**). The value of transactions inched up by merely 1.05 percent in CY16 compared to 4.06 percent in CY15 (10.29 percent in CY14). The slowdown in CY16 is visible in RTOB transactions as the value has declined by around 1 percent over the last year.

In terms of volume, ATMs lead with 63.05 percent share, well ahead of RTOB transactions having 24.47 percent share. POS transactions are also improving their share gradually over the past few years (**Figure 5.6**). This reveals that customers are using e-banking channels extensively for low value retail transactions. Also, the total volume of e-banking transactions has decelerated with 12.34 percent increase during CY16 compared to 16.65 percent in CY15 (20.87 percent in CY14).

Figure 5.6

Volume of E-Banking transactions consistently increased

Volume of E-Banking Transactions
(In Million)



Source: PSD, SBP

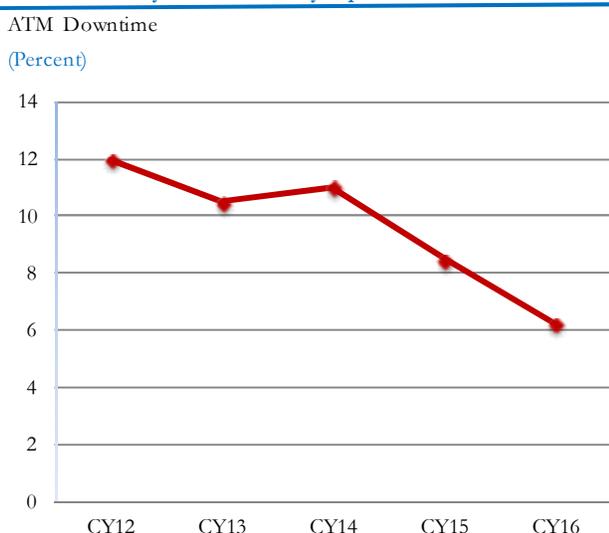
This slowdown in value and volume of e-banking transactions may be attributed to strengthening of oversight framework at SBP which resulted in removal of certain redundancies, in addition to the

impact of some fiscal measures to document the economy and to promote the tax culture. As the focus on financial inclusion has been enhanced over the last few years and targets have been set to increase the outreach, it may be feasible to revise the fiscal measures in such a manner so that they promote tax culture as well as facilitate financial inclusion in the country.

Improved ATM efficiency signals lower operational risk...

ATMs are among the most important interfaces of payment system. As the name suggest, their automatic functionality is important. If disrupted due to bank’s own system being down, poor connectivity with the system, power outages and no cash replenishment, especially in prolonged holidays, it may result in customer dissatisfaction and raise reputational risk. With stringent measures and monitoring by SBP, availability of ATMs has improved and its down time is on the decline over the past few years. It shows improved efficiency of ATMs, thus reducing operational risk (Figure 5.7).

Figure 5.7
ATM Efficiency has continuously improved



Source: PSD, SBP

Branchless Banking making inroads...

Currently, there are nine banks offering branchless banking services, include six commercial banks and three microfinance banks. In CY16, the number of accounts and deposits in branchless banking has increased by 30.30 percent and 32.74 percent, respectively. This demonstrates growing confidence of customers in this service. It also helped in raising the volume and value of branchless banking transactions to 478.5 million and PKR 2,169.5 billion, respectively, during the period under review (Table 5.5).

Table 5.5
Key Highlights of Branchless Banking

Description	CY15	CY16	Growth (percent)
No. of Agents	301,823.0	359,806.0	19.21
No. of Accounts (thousands)	15,322.0	19,964.9	30.30
Deposits as on period ends (PKR million)	8,827.0	11,717.0	32.74
No. of Transactions during the period (millions)	374.5	478.5	27.75
Average No. of Transactions per Day (thousands)	1,040.4	1,329.1	27.75
Value of Transactions during period (PKR billion)	1,872.5	2,169.5	15.87
Average Size of Transactions (PKR)	4,992.0	4,539.2	(9.07)

Source: AC&MFD, SBP

Enhanced oversight facilitates in minimizing operational risk and improves soundness...

Oversight of retail payment through monitoring of existing and planned systems is necessary for achieving the objective of safety and soundness of the system and promoting efficiency.

To this end SBP, after detailed discussions and deliberations with the stakeholders, has revised the data reporting templates enhancing its coverage to all payment channels.²⁰⁰ This would enable SBP to

²⁰⁰ PSD Circular No. 03 of 2016 and Circular Letter No. 07 of 2016 <http://www.sbp.org.pk/psd/2016/C3.htm> , <http://www.sbp.org.pk/psd/2016/CL7.htm>

perform proactive oversight of payment channels and instruments.

Also, SBP has enhanced its engagement with various market players including banks, payment system operators and payment service providers to ensure that market players make continuous efforts for upgrading the safety, security and resilience of their systems. To address the threat of cyber attacks, SBP has recently advised banks to continuously enhance their cyber security controls, processes and procedures in order to anticipate, withstand, detect, and respond to cyber attacks.

Customers' facilitation and protection a prime priority of SBP...

SBP has taken various measures and initiatives to facilitate end users of the financial services, one of its top priorities. Further, an effective customer complaints and redressal mechanism is in place at SBP to protect the rights of consumers in case of misconduct by the banks.

In order to enhance the security of payment cards and safeguard the interests of consumers, SBP has issued 'Regulations for Payment Card Security' in June 2016. These regulations outline a minimum set of operational, administrative, technical and physical safeguards to secure payment card operations.

In line with SBP's "Vision 2020" to enhance and promote financial inclusion, Pakistan's first domestic payment scheme PayPak has been launched in April 2016, to be operated by 1Link – the country's largest inter-bank switch. In this scheme, the transaction will be routed through domestic servers of the operator, rather than international routing as is done in Visa, MasterCard etc.

The PayPak card scheme is aimed at providing efficient, cost-effective, secure and omnipresent payments solutions. It is best suited for the

customers who want to make domestic payments only. This domestic scheme is expected to provide high level of local customization and enhanced regulatory oversight by the country's payment system regulator – SBP.

In order to enhance interoperability among various payment channels such as Alternative Delivery Channels (ADCs), Branchless Banking (BB) network and conventional payment service providers, the concept of establishing National Payment Gateway is under review at SBP. This will allow consumers to efficiently transfer funds to and from traditional banking accounts and branchless accounts.

Major developments in CY16 that could positively impact FMIs covering corporate sector settlements...

A couple of significant developments have taken place over the FMI landscape during CY16. These include: integration of the country's three stock exchanges into a single one and divestment of their shares to a strategic investor, and assumption of the role of CCP by the leading corporate securities' settlement company (NCCPL). Both these events are expected to contribute towards strength, competitiveness and resilience of the FMI.

Integration and divestment of the Stock Exchanges to bring technological advancement and operational efficiency...

A significant development in CY16 was the merger of the three stock exchanges of the country namely Karachi, Lahore and Islamabad stock exchanges to form a single entity i.e. the Pakistan Stock Exchange (PSX). Further, the majority shareholding of the PSX has been divested to a consortium led by three Chinese exchanges.

The integration of stock exchanges is expected to provide numerous benefits to the stakeholders including Trading Right Entitlement Certificate Holders (brokers), listed companies and investors.

The foremost benefit being the access to a more liquid, efficient and cost effective market. For investors, important benefits may be the facilitation of best price discovery, greater investor protection, ease of order execution and enhanced service delivery. A single stock exchange with strong risk management and investor protection mechanisms will be better able to attract investors from within and outside the country, apart from achieving synergies, economies of scale and regulatory and operational efficiencies.²⁰¹

The integration and divestment process is also expected to facilitate consolidation of brokers leading to financially strong entities that might be better placed to generate liquidity and expand market outreach. The strategic sale may help improve trading platforms, enhance global visibility and become a catalyst for introduction of new financial products such as derivatives securities (e.g., options).

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

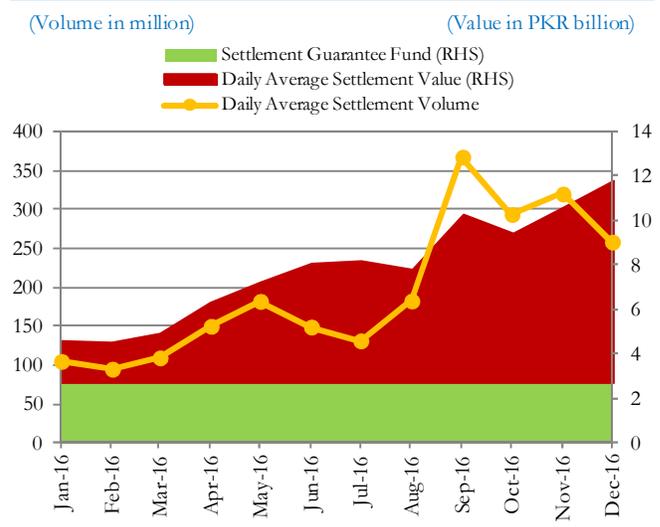
With the promulgation of Securities Act, 2015, the National Clearing Company of Pakistan Limited (NCCPL) has assumed the role of a Central Counter Party (CCP) with effect from May 2016. It, thereby, interposes between transacting counter-parties – a seller to the original buyer and a buyer to the original seller – to guarantee execution of the transactions by acting as the CCP. In doing so, it assumes the rights and obligations of the counterparties and reduces counterparty credit and liquidity risks exposures through multilateral netting.²⁰²

²⁰¹ SECP's Newsletter, *Spring 2016*

²⁰² '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'.

To facilitate settlements, NCCPL has established a well funded and liquid Settlement Guarantee Fund (SGF) to manage the risk of default. The fund is expected to be used in stress situations to settle the obligation of defaulting members.²⁰³ The initial size of the SGF has been determined through independent actuarial valuation and is established at PKR 2.75 billion.²⁰⁴

Figure 5.8
Comparison of Settlement Guarantee Fund with Daily Average of Settlement Value



Source: NCCPL and its Annual Report 2016

In case of a systemic event in the stock market, the securities may lose a sizeable portion of their value. As such, arrangement needs to be in place for effectively managing any crisis situation. The trading volume is rising due to recent upbeat activity on the stock market. The daily average of settlement values during CY16 at PKR 7.8 billion is much higher than the size of SGF (**Figure 5.8**). Once MSCI shifts PSX from Frontier Market Index to Emerging

Global Association of Risk Professionals (GARP) Schweser Notes, 2016, FRM: Financial Markets and Products, Kaplan Inc. USA
²⁰³ 'If a clearing participant defaults, a CCP typically has three lines of defence to cover the resulting losses – Default Waterfall of Resources: (i) defaulter's margins (initial and variation) (ii) default fund contributions; and (iii) the CCP's own financial resources (capital)'. Central clearing: trends and current issues; BIS Quarterly Review, *December 2015*

²⁰⁴ NCCPL's Annual Report, 2016

Market Index, these volumes are expected to be even higher. These developments entail further strengthening of SGF for adequate, smooth and seamless settlement of transactions in a crisis scenario.

In line with international best practices, the arrangement should be such that the onus of bailout of CCPs in case of stressed scenario should be borne by the market players i.e. the clearing members (specifically brokers), the CCP (clearing company) and the stock exchange.

NCCPL taking leading role in Risk Management functions of the stock exchange...

In accordance with the provisions of the Securities Act, 2015, the NCCPL has taken over the entire risk management functions of the capital market trades in CY16 that are executed and settled by the Clearing Members.²⁰⁵ These functions were previously performed by PSX. This is in addition to NCCPL performing the risk management of trades/ transactions of Ready and Futures markets executed by its Non-Broker Clearing Members (NBCMs)²⁰⁶ through Financial Institutions Risk Management System. Moreover, risk management functions for trades which are recorded in debt & leverage markets are also performed by the NCCPL.

Central Depository Company (CDC) launched innovative services to control custody risk...

Another significant FMI is CDC that is the only corporate Central Securities Depository (CSD) of the country. It handled 129.8 billion shares with a

total market capitalization of PKR 6,202.4 billion in Central Depository System (CDS) as of 31 December 2016. Its Investors Accounts have crossed the 50,000 mark in 2016 by reaching to 50,533 accounts (corporate investors – 1,522 and individual investors –49,011).²⁰⁷

To enhance the investors' protection, CDC introduced Direct Settlement Service (DSS) in 2015. This web-based service offers investors a risk-free option of keeping their cash in their accounts along with their securities. With brokers only executing trades, CDC takes up the responsibility of settling transactions (both in cash and securities) of the subscribers through investor accounts. This service minimizes investors' need of a sub-account with broker and allows investors to maintain both trade and custody of their portfolio through just one account.²⁰⁸

FinTech requires encouragement as well as putting in place the required safeguards...

Technological developments are taking place at a phenomenal speed; they are penetrating every sector of the economy and the financial sector is no exception. One such recent development is the Financial Technology (FinTech), which is at an early stage of its evolution. Fintech has great potential to expand access to financial services for both households and businesses. This could enhance sustainable and inclusive growth, provided that the accompanying risks are managed to maintain trust in the system.

SBP, being cognizant of the potential and associated risks of FinTech, has already issued "Rules for Payment System Operators (PSOs) and Payment Service Providers (PSPs)" in October 2014.²⁰⁹

²⁰⁵ <http://www.nccpl.com.pk/products-services/products-services-1/risk-management>

²⁰⁶ A person/ entity that is admitted as a Clearing Member to National Clearing and Settlement System under NCCPL Regulations is not a Trading Right Entitlement certificate holder (broker) of a stock exchange. NBCMs, generally include institutions but are not limited to, the banking companies, development finance institutions (DFIs), investments/ asset management companies under non-bank finance companies and insurance companies.

²⁰⁷ CDC's Newsletter, October-December 2016

²⁰⁸ CDC's Annual Report, 2016

²⁰⁹ PSO/ PSP means such Authorized Party that is a company registered under Companies Ordinance 1984 and is engaged in operating and/or providing Payment Systems related services like

These rules cover large firms requiring minimum paid-up capital of PKR 200 million. In addition, SBP has also envisaged a regulatory framework for small FinTech firms to encourage innovative payment solutions so as to maximize the opportunities and minimize the risks for the society (see **Box 5.2**).

electronic payment gateway, payment scheme, clearing house, ATM Switch, POS Gateway, E-Commerce Gateway etc. acting as an intermediary for multilateral routing, switching and processing of payment transactions.

Box 5.1: Role of SBP in Payment Systems and Functional Overview of Key Financial Market Infrastructures (FMIs) of Pakistan

State Bank of Pakistan (SBP) is playing following major roles in achieving its broad objectives of soundness and efficiency of payment systems.²¹⁰

- (a) **Role as Regulator:** SBP regulates and oversees payment systems under the Payment System and Electronic Fund Transfers Act, 2007. Under this Act, SBP has authority to issue regulations, rules and guidelines with the objective to reduce systemic and operational risk to make payments infrastructure more secure in order to promote financial stability.
- (b) **Role as Operator:** SBP plays a major role by operating Pakistan's Real-Time Interbank Settlement Mechanism (PRISM) – Real Time Gross Settlement System (RTGS). It acts as a settlement institution for wholesale interbank funds transfers, government securities and retail clearing batches. Moreover, SBP also operates the central depository for government securities which is an integral part of PRISM.
- (c) **Role as Facilitator:** SBP plays a crucial role in the development of retail payment systems by assessing and authorizing financial institutions with regards to their payment products, channels, services and instruments. SBP also coordinates with the government and private institutions to implement various initiatives relating to payment systems.

Payment and settlement transactions in Pakistan are largely dominated by: (1) electronic inter-bank fund transfers (IBFT), (2) paper-based payment instruments' clearing for inter-bank settlement, and (3) securities settlement (government as well as corporate). These transactions are managed by three different types of systems in place which are key elements of FMIs of the country. These are: (1) PRISM & Inter-bank Switches, (2) National Institutional Facilitation Technologies (NIFT), and (3) National Clearing & Settlement System and Central Depository System.

The brief functional overview of these systems is as follows:

(1) Inter-bank payments are classified into wholesale and retail transactions keeping in view the value of transaction and the type of party that initiates the transaction. Wholesale payment system is considered to be Systemically Important Payment System due to the fact that it processes large values and it can create systemic risk in the financial system. This risk can be mitigated by implementing a RTGS, thereby allowing financial institutions to settle their obligations in real time securely and irrevocably. PRISM, managed by the SBP, provides a central platform for the settlement of large-value interbank funds transfers, government securities, retail clearing and customer transfers (over a certain lower limit).

The country's retail payment system consists of 1Link and M-Net inter-operable inter-bank switches (1Link being the leading switch with strength of 36 member banks is a potential candidate for Systemically Important Payment System), which facilitate customers to access their funds and accounts through Alternate Delivery Channels (ADCs) such as Automatic Teller Machine (ATM), Point of Sale (POS), Internet, Mobile, Call Center, e-Commerce etc. These switches are also connected with payment schemes of VISA, MasterCard, China Union Pay (CUP), Japan Credit Bureau (JCB) and American Express (Amex) for international transactions.

(2) National Institutional Facilitation Technologies (Pvt.) Ltd. (NIFT) is a clearing house of paper instruments, which performs collection, clearing and netting of interbank obligations arising from processing of retail clearing payment instruments. The net obligations between banks are settled through PRISM.

(3) National Clearing Company of Pakistan Limited (NCCPL) is the country's corporate Securities Settlement System (SSS). It was incorporated to manage and operate the National Clearing & Settlement System (NCSS) in a fully automated environment. NCSS provides centralized clearing and settlement²¹¹ services to the Stock

²¹⁰ Payment Systems Review, 2014-15

²¹¹ *Clearing* refers to the processes (including margining and netting) between the period from trade execution until settlement. *Settlement* of

Exchange. All trade/ transactions are settled in NCSS on the settlement date (T+2) on Delivery vs Payment (DVP) basis²¹². NCCPL sends the securities delivery instructions to Central Depository Company (CDC), while the payment leg of securities transactions is settled through the settlement banks in PRISM.

The Capital Market of Pakistan has a triangular foundation comprising of the PSX, NCCPL and CDC. CDC is recognized as the infrastructure backbone of the Pakistan capital market and it is the sole corporate Central Securities Depository (CSD) in the country. The main function of CDC is to operate and maintain the Central Depository System (CDS) – an electronic book-entry system used to record and maintain securities and to register the transfer of securities. The system changes the ownership of securities without any physical movement or endorsement of certificates and execution of transfer instruments. Both NCCPL and CDC are regulated by the Securities and Exchange Commission of Pakistan (SECP).

Committee on Payment and Settlement System (CPSS) of BIS and Technical Committee of the International Organization of Securities Commissions (IOSCO) issued “Principles for Financial Market Infrastructures” in April 2012. All the FMIs were encouraged to observe those principles to achieve public policy objectives of safety and efficiency, transparency and financial stability including limiting systemic risk.

These principles were designed to apply on systemically important FMIs. The presumption is that all CSDs, SSSs and CCPs are systemically important (unless otherwise specified by the authorities) typically because of their critical roles in the markets they serve.

As far as Payment Systems are concerned, in general a payment system is systemically important if it has the potential to trigger or transmit systemic disruptions; this includes, among other things, systems that are the sole payment system in a country or the principal system in terms of the aggregate value of payments; systems that

mainly handle time-critical, high-value payments; and systems that settle payments used to effect settlement in other systemically important FMIs²¹³.

In this backdrop, there is a need to assess the feasibility of designating large value payment system (PRISM) and the largest e-banking retail inter-bank payment switch (1Link with 36 member banks) as systemically important payment systems. In this way, the application of BIS-IOSCO principles (in letter and spirit) would help enhance management of credit, liquidity, general business, custody, investment and operational risks of these payment systems.

a trade occurs when the trade is completed and all payments have been made and legal obligations satisfied.

²¹² <http://www.nccpl.com.pk/products-services/products-services-1/clearing-settlement-services>

²¹³ CPSS (BIS) and IOSCO, (2012). “Principles for Financial Market Infrastructures”

Box 5.2: Financial Technology (FinTech)

Financial Technology (FinTech) is a dynamic segment at the intersection of the financial services and technology sectors where technology-focused start-ups and new market entrants innovate the products and services currently provided by the traditional financial services industry. As such, FinTech is gaining significant momentum and causing disruption to the traditional value chain.²¹⁴

Keeping in view the importance of the issue, many multilateral organizations, including Financial Stability Board (FSB), have been monitoring FinTech activities to understand their implications for financial stability. On the advice of G20, FSB has launched the work on the regulatory and supervisory issues pertaining to FinTech. In this respect, FSB has established the “FinTech Issues Group”. FSB is expected to publish its report in 2017 identifying the key regulatory and supervisory FinTech risks that merit authorities’ attention.

These new technologies could transform wholesale payments, clearing and settlement. In particular, Distributed Ledger Technology (DLT)²¹⁵ could yield significant gains in the accuracy, efficiency and security of such processes, thus saving a substantial amount of bank capital and significantly improving the resilience of the system.²¹⁶

Currently, there are some efforts underway to nurture FinTech globally. Most importantly, a number of central banks have commenced experiments or proof of concept to study the viability of replacing the RTGS systems with wholesale payment systems based on DLT. These experiments with DLT applications in securities settlement aim for speeding up settlement and reducing

back office costs while providing greater transparency of transactions and holdings.

For example, in order to help distinguish distributed ledger’s potential from its hype, the Bank of England (BOE) is participating in several related initiatives. They have completed their own proof of concept. Now BOE aims to make their next generation RTGS compatible with settlement in a distributed ledger.²¹⁷

The SBP is also currently studying ‘blockchain’ technology solution (known as DLT) being experimented by central and commercial banks around the globe to bring efficiency in the processing of financial transactions and for protection against cyber crimes²¹⁸.

In Pakistan, FinTech activities and entities mostly related to retail payments area are in the swing at this stage. Presently, some other facets of FinTech are not prevalent in country. However, crypto-currencies²¹⁹ are around for quite some time. The awareness about crypto-currencies is not very high in the country at the moment. Some tech savvy people (like bloggers) are trying to create awareness among the people regarding this ‘alternative payment method’ and have set up their own small businesses dealing with crypto-currencies.²²⁰

Since virtual currency is an unregulated phenomenon, it may become a cause of regulatory concern going forward after getting some sizeable momentum. Keeping in view the limited awareness and nascent phase of virtual currencies so far, it may not be a challenge for financial stability of Pakistan for now.

²¹⁴ PWC Global FinTech Report 2016

²¹⁵ A distributed ledger is a database that is consensually shared and synchronized across network spread across multiple sites, institutions or geographies. It allows transactions to have public “witnesses,” thereby making a cyber attack more difficult. Source:<http://www.investopedia.com/terms/d/distributed-ledgers.asp#ixzz4gSz1p15l>

²¹⁶ Oliver Wyman and Santander estimated that distributed ledger technology could reduce banks’ infrastructure costs attributable to cross-border payments, securities trading and regulatory compliance by \$15-20bn per annum by 2022. See: <https://santanderinnovations.com/fintech2/>

²¹⁷<http://www.bankofengland.co.uk/publications/Documents/speeches/2017/speech974.pdf>

²¹⁸ Speech delivered by the Executive Director, SBP at 15th Innovative, Diebold Nixdorf e-banking conference, 2017 at Karachi.

²¹⁹ Crypto-currency refers to a math-based, decentralized, convertible virtual currency which is based on cryptography. The currency is constructed on complex mathematical algorithm which ensures safety and anti-counterfeiting during its transactions (Stevenson, 2013).

²²⁰ Bizinjo and Talal, Crypto-Currency: The Disruptive Phenomenon, *State Bank News*, July 2016

