

Payment and Settlement Systems

12.1 A well-functioning Payment and Settlement System works as a part and parcel of modern financial market infrastructure easing operation of monetary policy supported by market-based instruments and smoothening liquidity management in the economy towards efficient allocation of resources and mitigation of systemic risks. In tandem with sophisticated developments in the payments and settlement systems following technological innovations in the field of electronics and telecommunication, Bangladesh Bank has undertaken efforts to upgrade existing payment systems with focus on the capacity building necessary to define a long-term strategy for payments in Bangladesh. This is important for the healthy growth of the financial market infrastructure through safe and efficient payment and settlement systems ensuring fast and secured transfer of money and financial instruments using modern technological innovations.

12.2 Considering the importance of having a state-of-the-art payment and settlement systems for Bangladesh, Payment Systems Department (PSD) of Bangladesh Bank has been working on payment systems strategy, automated cheque processing system, electronic funds transfer, national payment switch, real time gross settlement, mobile financial services, e-commerce, m-commerce, legal and regulatory framework for electronic payment systems and payment systems oversight in order to modernise the country's payment system to be safe and efficient in

compliance with international standards. It will enable faster economic growth and access to banking for all citizens of Bangladesh.

12.3 With the ambition to ensuring seamless financial transactions, the BB has undertaken huge project in building up modern payment automation infrastructure. Bangladesh Automated Clearing House (BACH) has started operation resulting in a gradual shift from cash and paper based transactions to electronic modes of payments. The instruments like cheques, bank drafts, pay orders, dividend & refund warrants, etc. which were previously being cleared through the manual clearing houses and now these have been replaced with BACH process. Apart from such non-cash payment instruments, credit card, debit card and ATM transactions are popular specially in the urban areas.

12.4 Bangladesh Automated Cheque Processing System (BACPS) started its live operation from 7 October 2010 for developing an electronic payment system in the country. Later electronic funds transfer, e-commerce, mobile financial services and m-commerce joined the system to further modernise the payment and settlement systems as set in the strategy. These payment platforms are briefly described in the following sections.

Bangladesh Automated Clearing House (BACH)

12.5 BACH has two components-the Automated Cheque Processing System and

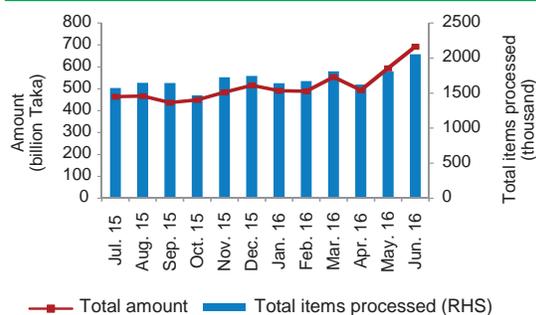
the Electronic Funds Transfer Network (EFTN). Both systems operate in batch processing mode-transactions received from the banks during the day are processed at a pre-fixed time and settled through a single multilateral netting figure on each individual bank's respective books maintained with Bangladesh Bank. A virtual private network (VPN) has been working between the participating commercial banks and the data centre (DC) and disaster recovery site (DRS) at Bangladesh Bank's end for communicating necessary information related to BACH. Digital certificate has also been formulated in Bangladesh for secured data communication.

Bangladesh Automated Cheque Processing Systems (BACPS)

12.6 BACPS uses the cheque imaging and truncation (CIT) technology for electronic clearing of the paper-based instruments, i.e. cheque, pay order, dividend & refund warrants, etc. The system supports both intra-regional and inter-regional clearing and is based on a centralised processing centre located in Dhaka and in designated clearing regions. The system conforms to the international best practices and also represents the most cost effective solution for cheque processing throughout the country.

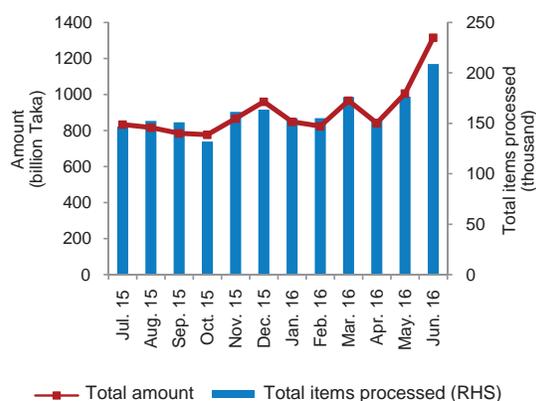
12.7 During FY16, 20.4 million regular and 1.9 million high value cheques and other instruments valued at Taka 6125.7 billion and Taka 10836.2 billion respectively were cleared. The clearing cycle has been brought down to t_{+1} for regular value cheques and t_{+0} for high value cheques throughout the country. Chart 12.1 and Chart 12.2 show the monthly trends of instruments cleared and associated amount of regular and high value cheques respectively in FY16.

Chart 12.1 Number of regular value cheque and amount



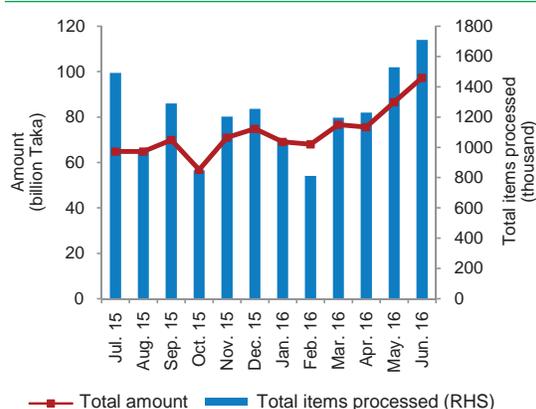
Source: Payment Systems Department, Bangladesh Bank.

Chart 12.2 Number of high value cheque and amount



Source: Payment Systems Department, Bangladesh Bank.

Chart 12.3 Number of credit entries and amount



Source: Payment Systems Department, Bangladesh Bank.

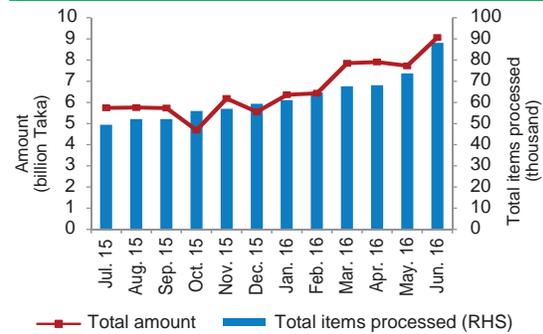
Bangladesh Electronic Funds Transfer Network (BEFTN)

12.8 BEFTN has started its live operation since 28 February 2011 with the objective to encourage paper-less electronic payment methods for secured, faster and cost-effective transactions specially at the corporate levels. The network started with credit and debit transactions from 15 September 2011.

12.9 BEFTN has become the faster and efficient means of inter-bank clearing over the existing paper-based system. A wide variety of credit transfers such as payroll, foreign and domestic remittances, social security, company dividends, retirement benefits, expense reimbursement, bill payments, corporate payments, Government tax payments, veterans payments, Government licence fees and person to person payments as well as debit transfers such as mortgage payments, membership dues, loan payments, insurance premiums, utility bill payments, company cash concentration, etc. are settled under the network. Till 30 June 2016, officials of 62 ministries are receiving their salaries through this system. Besides, salary of the officials of some other Government agencies like Anti-Corruption Commission and salary of Government primary school teachers are being distributed through EFT.

12.10 During FY16, a total of 14.6 million EFT credit transactions worth Taka 875.3 billion and a total of 0.7 million EFT debit transactions worth Taka 79.0 billion were completed through BEFTN. During FY16, increasing trends were observed in both credit and debit entries in terms of number and amount of transactions. Chart 12.3 and Chart

Chart 12.4 Number of debit entries and amount



Source: Payment Systems Department, Bangladesh Bank.

12.4 show the monthly trends of EFT credit and debit entries and associated amount respectively in FY16.

e-Commerce

12.11 BB has issued directives for the banks for starting e-commerce activities. Permitted transactions are:

- Online payment of utility bills from client's accounts to recipient's accounts,
- Transfer of money within different accounts of a client in the same bank, payment/collection of money from/to buyer's bank account to seller's bank account for buy/sale of products,
- Transaction via internet using credit card in local currency.

Mobile Financial Services (MFS)

12.12 The rapid growth of mobile phone users and countrywide coverage of mobile operators' network have made their delivery channel an important tool for trade for extending banking services to the unbanked/banked population, specially to expedite faster delivery of remittances across the country. As on 30 June 2016, total 25

banks were given permission for mobile financial services, whereas 18 banks/subsidiaries were in operation. Total number of registered customers was 36.2 million and they had 0.6 million agents for smooth services to their customers. From legal and regulatory perspective, only bank-led model is allowed to operate in Bangladesh. Table 12.1 lists a vivid scenario of MFS in Bangladesh during FY16.

The approved mobile financial services (in broad categories) are as follows:

- Disbursement of inward foreign remittances.
- Cash in/out using mobile account through agents/bank branches/ ATMs/mobile operator's outlets.
- Person to business payments e.g. utility bill payments, merchant payments.
- Business to person payments e.g. salary payment, dividend and refund warrant payments, vendor payments, etc.
- Government to person payments e.g. elderly allowances, Freedom-fighter allowances, subsidies, etc.
- Person to Government payments e.g. tax, levy payments.
- Person to person payments (one registered mobile account to another registered mobile account).
- Other payments like microfinance, overdrawn facility, insurance premium, DPS, etc.

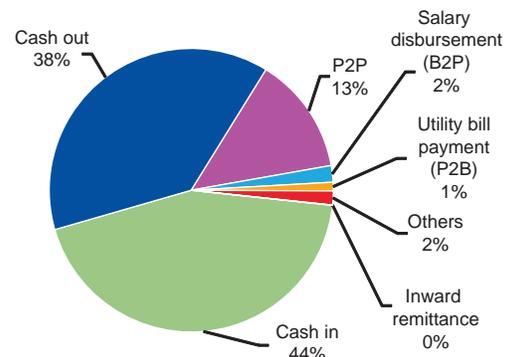
12.13 Under the umbrella of mobile financial services, inward remittances, cash-

Table 12.1 Present scenario of MFS in Bangladesh

Months	No. Agent (in thousand)	No. of registered customers (in million)	No. of transaction (in million)	Transaction amount (in billion)
July 15	531.7	28.7	97.7	138.1
Aug 15	533.9	28.3	102.1	128.4
Sep 15	542.4	29.2	106.4	150.7
Oct 15	547.8	30.2	107.4	130.4
Nov 15	552.7	31.2	110.9	149.2
Dec 15	561.2	31.8	114.8	161.2
Jan 16	569.7	33.1	118.8	167.5
Feb 16	577.0	34.0	116.2	165.7
Mar 16	584.9	34.9	121.3	182.4
Apr 16	577.6	35.6	119.6	182.1
May 16	592.4	35.5	120.1	184.8
Jun 16	604.4	36.2	124.5	231.5

Source: Payment Systems Department, Bangladesh Bank.

Chart 12.5 Market share of different services in MFS in June 2016



Source: Payment Systems Department, Bangladesh Bank.

in, cash-out, P2P transactions, B2P transactions, P2B transactions etc. have been provided. Day by day both the volume and monetary value of the transactions are increasing and it is real opportunity for underprivileged people to avail formal financial services. Chart 12.3 describes the position of market share of different types of mobile financial services for the month of June 2016.

Internet Banking

12.14 Since 11 March 2011, permission has been given to transfer up to Taka 0.5 million from one client's account to another client's account within the same bank using internet/online facilities subject to the fact that it will fully comply with prevailing money laundering prevention legislations, anti-terrorism related law, rules and circulars issued by BB.

National Payment Switch Bangladesh (NPSB)

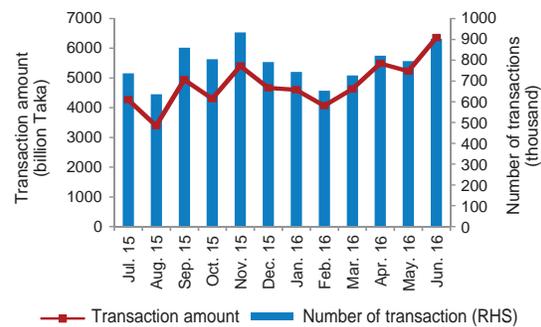
12.15 National Payment Switch Bangladesh (NPSB) was launched on 27 December 2012. Bangladesh Bank introduced National Payment Switch Bangladesh (NPSB) in order to facilitate interbank electronic payments originating from different channels like Automated Teller Machines (ATM), Point of Sales (POS), internet, etc. The main objective of NPSB is to act as a mother switch and to gradually connect all child switches owned or shared (owned and operated either by bank or a non bank entity), to create a common electronic platform for the switches in Bangladesh. At present, 51 banks are operating card business in Bangladesh. Among those, interbank ATM transactions of 49 banks and POS transactions of 39 banks are being routed through NPSB. Other banks are also likely to join to NPSB. The number and volume of the interbank ATM and POS transactions through NPSB are growing rapidly. Chart 12.6 and 12.7 show the monthly trends of NPSB interbank ATM and POS transactions number and associated amount during FY16.

Table 12.2 Number of ATM and POS in Bangladesh

Terminal	As on December 2014	As on April 2016	Growth
ATMs	6202	8320	25.5
POS	22123	30363	27.1

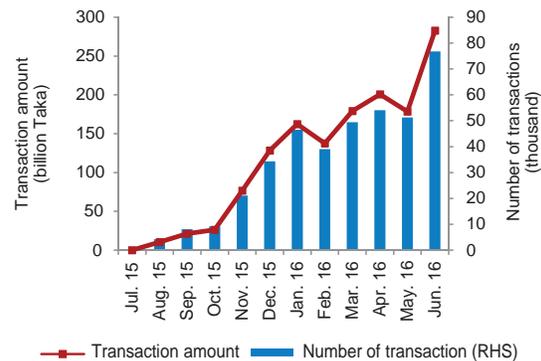
Source: Payment Systems Department, Bangladesh Bank.

Chart 12.6 Trends of interbank ATM transaction



Source: Payment Systems Department, Bangladesh Bank.

Chart 12.7 Trends of interbank POS transaction



Source: Payment Systems Department, Bangladesh Bank.

12.16 Payment Systems Department (PSD) of Bangladesh Bank is working closely with all banks and stakeholders towards digital payment systems as well as digital Bangladesh. NPSB is contributing a lot to popularise card based electronic payment in Bangladesh. As a result, several card based

payment terminals are growing fast. Table 12.2 shows growth of ATM and POS in Bangladesh. To ensure safe, efficient and digital payment systems, PSD is also working on formulating and publishing NPSB operating manuals, ATM operating guidelines and other related regulatory frameworks.

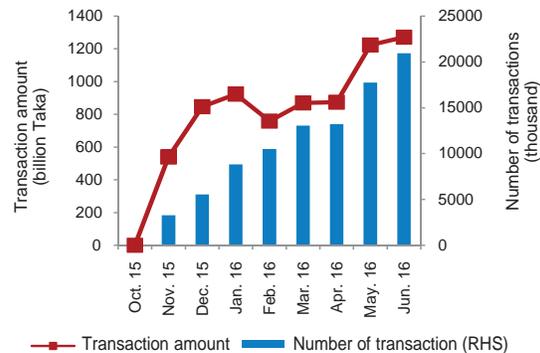
Real-Time Gross Settlement (RTGS)

12.17 RTGS launched in Bangladesh on 29 October 2015. All the scheduled banks (except one) were connected to the system from the first day of operation. Initially participant banks were mostly interested in bank to bank transaction. After performing few public awareness campaigns like road show and rally in most of the large cities, customer to customer transaction increased. Both number and amount of transaction is increasing day by day. Currently, RTGS system processes 900 transactions worth of Taka 5 billion on each business day. All the concern departments linked to RTGS are working together for better coordination and developing process for smoother, faster and safer operation. Intraday liquidity facility (ILF) for the participating banks and Interbank domestic foreign currency transaction and settlement testing are underway and after finishing the testing, this feature is going to be live soon.

Payment Systems Operator (PSO) and Online Payment Gateway Service Providers (OPGSPs)

12.18 As a growing economy, e-commerce and online purchase are gradually popularising and increasing in the country. Online Payment Gateway Service Providers

Chart 12.8 Trends of RTGS transaction



Source: Payment Systems Department, Bangladesh Bank.

(OPGSPs) play a crucial role for settling the payment leg of e-commerce and online purchase. Considering the market demand Bangladesh Bank has permitted total 5 (five) organisations to work as payment systems operator (PSO) to facilitate the payment leg of the e-commerce/online purchase. Banks are now allowed to offer the facility of receiving remittances against small value service exports in non-physical form such as data entry/data process, off-shore IT service, business process outsourcing etc. The exporters of the above services will be able to receive their overseas payments through the OPGSPs.

Legal and Regulatory Framework

12.19 BB has published a number of legal and regulatory documents to provide legal and regulatory support for electronic transfer of funds. Existing legal and regulatory framework of payment and settlement systems of Bangladesh are mentioned below:

- "Bangladesh Automated Cheque Processing Systems (BACPS) Operating

Box 12.1 Cyber Risk Management in Banking Sector of Bangladesh

Computers, internet and other electronic medium are the tools that make possible the instant exchange and distribution of data, images, and materials. The fraudulent activities of IT are termed as cybercrime, e-crime, hi-tech crime, or electronic crime. These practices involve the use of computer or internet as a medium, source, instrument, target, or place of a crime. Computer and Internet plays the key role in various activities, such as recording financial transactions, routing telephone calls, measuring power usage, monitoring medical treatments, etc. However, they also contribute to electronic crime, such as cyber stalking, phishing, hacking, denial of services, e-mail spoofing, spamming which means sending multiple copies of unsolicited mails or mass e-mails such as chain letters and cyber defamation, etc. Although, Internet and web technologies are growing at a fast pace and are providing new opportunities, they are also consisting of certain threats like, email espionage, credit card fraud, spam, software piracy, etc.

In the banking sector, illegal money transfer and removal from one to another account are identified as banking fraud. Cybercrimes are classified into four broad categories: cyber-deception, cyber-violence, cyber-trespass and cyber-pornography. The banking frauds are classified under cyber-deception which is termed as an immoral activity including credit card fraud stealing, and intellectual property violations.

ATM frauds, e-money Laundering and Credit Card Frauds are the most witnessed cybercrimes in the banking sector. In general, all the frauds are executed with the goal of accessing user's bank account, stealing funds and transferring it to some other bank account. In some cases the cyber criminals use the banking identifications i.e. passwords, e-PIN, certificates, etc. to access clients' accounts; whereas in other cases, they may want to steal and transfer money into another accounts illegally. The intention of cyber criminals sometimes is just to harm the image of the banking firm and therefore, they block the bank servers blocking the access of clients' accounts. The defense system of banking sector contains a lot of exposures, so there is always a need for investigation for increasing awareness about the procedures that can be undertaken to contest cyber related crimes in the banking sector.

In the last few years, the banking sector of Bangladesh was the victim of several security breaches:

- On 6 January 2013, Islami Bank Bangladesh Limited site was hacked by Human Mind Cracker.
- In 2015, bank accounts of a private bank were hacked and money was withdrawn from them.
- On 2 December 2015, hackers breached the network security of Sonali Bank Limited and took control of its website for a couple of hours. The programmer distinguished himself as a 'Muslim Hacker'.
- In February 2016, skimming attacks in six ATM booths of three commercial banks.
- And the largest e-money laundering in the history of banking occurred in February 2016, when hackers stole USD 101 million from the Bangladesh bank's account with the Federal Reserve Bank of New York of which about USD 35 million has been recovered.

Evidence of hacking in commercial banks demonstrates corruption in the government's procurement framework where unqualified vendors were selected without proper evaluation of skills and consultation of IT experts. This incident persuaded the Bangladesh Bank recommending to all banks and financial institutions to ensure cyber-security governance:

- Taking measures for ascertaining existing technical gap assessment and vulnerability through a comprehensive cybersecurity risk study.
- Treating cybersecurity as a collective responsibility by all financial institutions.
- Installing anti-skimming devices to the ATM booths.
- Use of EMV (Euro pay, MasterCard & Visa) Standard card to avoid skimming.

The present described overview is of ongoing efforts to prevent and control technology and computer related crime, highlighting general trends and development within and outside the banking sector of Bangladesh. The banking industry is constantly experiencing cybercrimes. Since there was no noteworthy incidents of cybercrime took place in the banking sector of Bangladesh before 2016, there was no urge for such protective measures against those crimes. But now it is high time for the banks to concentrate on cyber risk management and mitigation. So, new technologies and services must be adopted to cope with the situation as well as competition and security governance must be complied with technological and legal advancement in the area of banking sector is necessary to overcome the cyberthreats in banking industry.

As a regulatory authority of the banking sector, Bangladesh Bank has released the third version of ICT Security Guideline for banks and financial institutions focusing on different necessary controls for securing banking transactions including management guidance for adoption of secure technology and skilled manpower, Risk management, alternate delivery channels security, capacity management, BYOD controls, network perimeter security, project management approaches and other necessary compliance issues. Bangladesh Bank also instructed banks to adopt cyber security governance, assess full cyber risk and to take adequate plan to mitigate cyber threats.

- "Rules and Procedures" has been published on 11 January 2010.
- "Guidelines on Mobile Financial Services for the Banks" has been published on 22 September 2011.
- "Guidelines on Agent Banking for the Banks" has been published on 9 December 2013.
- "Bangladesh Payment and Settlement Systems Regulations (BPSSR), 2014" has been published on 15 May 2014.
- "Bangladesh Electronic Funds Transfer Network (BEFTN) Operating Rules" has been published on 15 May 2014.
- "National Payment Switch Bangladesh (NPSB) Switch Operating Rules and User Manual: Disputes Management Rules" has been published on 14 May 2015.
- "Bangladesh Real Time Gross Settlement (BD-RTGS) Systems Rules" has been published on 9 September 2015.

Other Payment Systems Initiatives

12.20 In order to fulfill the ever growing demand for faster and efficient payment methods, the Payment Systems Department (PSD) of Bangladesh Bank is closely working with the international organisations to develop a safe, secure and efficient payment

infrastructure for the country following the international best practices. Bangladesh Bank has finalised the draft Payment Systems Act which is now under process to send the same to the concern ministry for required approvals. PSD is working closely with the Government organisations for introducing online VAT payment system. PSD is also working to find out the financial and economic benefits of the country's electronic payment methods. In this continuation, a new initiative has been undertaken with IFC of World Bank Group.

Awareness Raising Campaign

12.21 Bangladesh Bank has taken a number of initiatives for raising awareness on the new electronic payment systems like automated cheque processing, electronic funds transfer, national payment switch, real time gross settlement and mobile financial services. BB has organised seminars and workshops for officials of all commercial banks, Government offices and industry alliances. Besides, BB has been working to popularise electronic funds transfer network among the stakeholders like Chamber of Commerce, Stock Exchanges, Bangladesh

Security and Exchange Commission, Central Depository Bangladesh Limited, National Board of Revenue, etc. PSD has arranged several seminar, rally and rode-show at different divisional city as a part of awareness raising campaign.

12.22 Electronic payment and settlement systems have already proved their potential by offering fast, secure and cost-effective financial services. Specially, paper-less EFT transactions are gaining popularity among the corporate bodies, stock exchange members and industry alliances. The mobile financial services, m-commerce and e-commerce are significantly changing the financial services landscape of the country. NPSB will increase end-user centric electronic payments and broaden the landscape for financial transactions in the country. These electronic modes of payment have already improved operational efficiency, increased transaction frequency and brought stability and flexibility in all spheres of the financial market. Implementation of RTGS has taken the country's Payment and Settlement System at per international standard.