

Certificate Program in Global Payment Operations

Participant Workbook

For

B A Continuum India Pvt. Ltd.



1 Introduction to Payments System

Chapter Overview:

This chapter is designed to help the participants get a sound understanding of the Payment Systems. Specifically, you will learn about the need & importance of payment systems, their classification, assessing customer need for payment products, role of Central Bank and Clearing in Payment infrastructure, types of payment systems, and types of settlements, electronic, cards and paper based payment systems etc.

1.1 Business Scenarios

ExxonMobil is the world's largest publicly traded international oil and gas company. It holds an industry-leading inventory of global oil and gas resources. They are the world's largest refiner and marketer of petroleum products. And their chemical company ranks among the world's largest.

For its purchase of bulk crude the client will need large value payment systems. Since global trade in oil is US Dollar denominated this need might not be cross-border in nature.

A marketer is more likely to receive smaller payments. Therefore it might be that there is lower need for making retail payments volume.

PayPal is an e-commerce business allowing payments and money transfers to be made through the Internet. PayPal serves as an electronic alternative to traditional paper methods such as checks and money orders. Currently, PayPal operates in 190 markets, and it manages over 184 million accounts. PayPal allows customers to send, receive, and hold funds in 19 currencies worldwide. PayPal's Total Payment Volume (TPV), the total value of transactions in Q1 2009 was nearly \$16 billion.

The business is largely focused on small payments made by PayPal customers to "buy" electronic money. When e-money is used to make purchases on the net PayPal needs to make a remittance to the seller. PayPal likely needs a range of payment solutions appropriate to each market in which it operates. This could include paper methods as well as ACH/EFT payments. It would appear that PayPal does not have a significant need for bulk transfer of funds.

Du Pont is a chemical company that was founded in July 1802 as a gunpowder mill by Eleuthero Irene du Pont. DuPont is currently the world's second largest chemical company (behind BASF) in market capitalization and fourth (behind BASF, Dow Chemical and INEOS) in revenue. The company's corporate headquarters are located in Wilmington, Delaware. The company's manufacturing, processing, marketing and research and development facilities, as well as regional purchasing offices and distribution centres are located throughout the world.

Based on the wide spread regional purchasing offices it would appear the company has a number of suppliers small and large, the world over. The company needs to use various payment methods for each of those markets. Since manufacturing centers are also globally distributed it is likely the company needs to make large funds transfers to those centers.

1.2 The Need for Payment Systems

The need for payments arises from commercial transactions of various types. Payment is the “delivery of money” making it a critical component of a commercial transaction.

Modern economies thrive on trade - trades result in transactions - and transactions can be either domestic or international. Trade transactions are categorized on the basis of who the two parties (counterparties to the trade) to the transaction are:

Individuals (Peer to Peer or P2P),
Businesses and consumers (B2C),
Businesses (B2B),
Individuals and Government (I2G),
Businesses and Government (B2G), and
Government and individuals/businesses



Let's look at some transactions covering the above types:

- Tom walks into a Walmart store in Chicago - purchases groceries and makes payment by way of a Check
- Rita calls up her Broker and orders the purchase of 100 common shares of Microsoft Corporation
- Franklin Templeton (FT) and Morgan Stanley trade in stocks (OTC) where FT sells 2.5 M shares of Yahoo!
- A customer of SBI wants to make a foreign currency loan repayment of \$ 20 M
- Atos acquires a software company in an all-cash deal and has to pay \$ 100 M for the transaction
- Raj buys an old Sherlock Holmes masterpiece on www.eBay.com from a seller based in South America
- Tyson Foods with more than one lakh employees on its rolls makes its salary payments on a weekly basis
- An insurance company collects monthly insurance premiums from over 1 million customers
- Sachin walks into an electronic store, swipes his credit card and buys a Sony Bravia HDTV
- Beyoncé logs onto Amazon.com and buys an Apple iPhone XS
- Hrithik walks into a Citibank ATM in Mumbai and uses his HSBC debit card to withdraw cash

What is common in all these transactions is that:

Most of them are routine in nature -

- Involve transactions in different kinds of markets like:
 - Retail trade
 - Banking
 - Securities
 - M&A and
 - Foreign Exchange
- Involve movement of money

Trade transactions excluding barter transactions, if any, will be treated as final only when moves from the buyer to the seller. This movement of money requires a robust global payments infrastructure in which banks play a very important role.

A typical customer for a bank would be an industrial or commercial organization - Manufacturing companies, Retailers, Services Companies

A large bank and its client-facing personnel have a good idea about the typical business model of such clients. Therefore, the bank is well placed to visualize the needs of these customers in the matter of Payment Services.

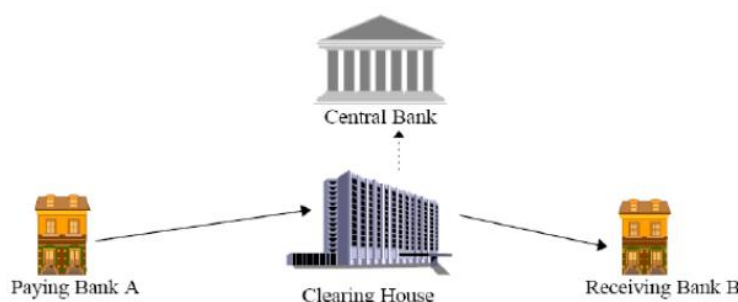
Banks have several competitors in the financial space from amongst non-banks

- Brokerages
- Currency exchange houses
- Financial Advisors
- Smaller, local banks

There is one area in which non-banks cannot compete; for payments - the movement of money- they are completely reliant on banks. In the case of smaller banks some of the more sophisticated requirements such as cross-border or large value payments require the smaller bank to tie up with a larger bank as a correspondent.

This makes it possible for a bank to market Payment Services to such companies as a market segment. Being familiar with each of these businesses the larger bank can visualize the needs of such customers quite easily.

1.3 Key Entities in a Payment System



- **Paying bank** - The bank where payer has an account and from where the payment is initiated.
- **Receiving bank** - The bank where payee has an account and receives the money.
- **Central Bank** - The prime monetary/regulatory authority of the country, issuer of currency, banker of banks. It formulates, implement and monitors the monetary policy, maintain price stability and ensure adequate flow of credit to productive sectors, managing country's foreign exchange and gold reserve and managing both inflation and exchange rates
- **Settlement Agent** - The role of **Settlement Agent** is normally assumed by the central bank for the relevant currency, which transfers funds between accounts held with it by the commercial banks, known as 'settlement in central bank money' which guarantees unconditional and irrevocable settlement. We see that the debtor would still be liable if his bank fails even after debiting his account.

He is however no longer liable if the creditor's bank fails after its account has been credited by the central bank. The time interval between the moment at which the debtor's account is debited and the funds are made available to the creditor is known as the *float*.

As the volumes of payments grew (and we are talking nowadays about tens of millions of payments daily in an advanced economy) it was no longer possible to settle each payment gross in central bank money as described above. It became therefore necessary to introduce Automated Clearing Houses (ACH) which perform the clearing, defined as 'the process of transmitting, reconciling and, in some cases, confirming payment orders or security transfer instructions prior to settlement, possibly including the netting of instructions and the establishment of final positions for settlement.

The settlement agent manages the settlement accounts of the direct members and transfers amounts between them to achieve finality. Technically this role could be undertaken by a commercial bank or a central bank, but risk management considerations point towards the central bank which holds the monopoly for issuing legal tender: the credit and liquidity risk are theoretically nil as only the central bank can issue currency without limits or security, influenced only by macro-economic considerations such as money supply, price stability, interest or exchange rates. This has given rise to the settlement in central bank money doctrine which dictates that 'assets used for settlement should preferably be a claim on the central banks particularly for systemically important systems. All large-value systems and national ACHs are considered to be systemically important.

- **Banks** - Banks are the compulsory intermediates between users and payment systems as they hold a license to take deposits and effect payments for which they are subjected to regulation. They maintain accounts on behalf of their customers which are debited or credited when a payment is effected or funds are received.

If a payment is effected between two accounts held by the same bank, the amount will be transferred between the debtor's and the creditor's accounts. These **intra-bank** payments, known as 'on us' or 'book entry' payments, do not affect the bank's overall treasury position. If, however, the creditor's account is held by a different financial institution this **interbank** payment results in a debt between the two banks which has to be settled through correspondent accounts (accounts held by banks with each other) or a payment system, which impacts the treasury, liquidity and risk positions of both banks. Although access to most payment systems is restricted to banks, several disintermediation factors have emerged over the past 10 years.

Banks send batches of payments to the ACH which, after sorting and merging, sends the banks details of payments for their customers. It also calculates and transmits the net positions between the banks to the settlement agent (normally the central bank) which transfers the net amounts between the settlement accounts of the participating banks, therefore assuring final settlement for all payments in that cycle. It is therefore important to distinguish between clearing, which is a set of processes, and settlement which is an event which guarantees the discharge of the debts which takes place when the central bank transfers the funds between the accounts of the debtors' and the creditors' banks

- **Clearing Houses** - As we have seen, central banks act generally as settlement agent. They also, most often, operate the large-value RTGS systems, while the private sector operates some large-value systems (for instance CHIPS in the US and the EURO1 system operated by the Euro Banking Association (EBA)) as well as virtually all low-value ACHs and card clearings.

Central banks are however responsible for oversight: ‘a central bank task, principally intended to promote the smooth functioning of payment systems and to protect the financial system from possible “domino effects” which may occur when one or more participants in the payment system incur creditor liquidity problems.

Payment systems oversight aims at a given system (e.g. a funds transfer system) rather than individual participants’. The Committee on Payment and Settlement Systems (CPSS) of the Bank for International Settlements (BIS) in Basel is the main forum where central banks cooperate internationally to issue common guidelines on oversight and managing risks in payment systems. Although bank supervision is not always the responsibility of the central bank (for instance in the UK where it has been devolved to the FSA), it can take action against the entire banking system or individual banks. As it maintains the settlement accounts, the central bank is well positioned to monitor each bank’s position in real time: balance, liquidity, number of payments queued, ability to secure funding in the money markets. If a bank appears to be in difficulty, the central bank can secure emergency funding or, in extreme cases, suspend the bank from the payment system; this would however be a very serious decision as it could create a systemic, or ‘domino’ crisis which would affect the reputation of the financial marketplace. Whatever action it takes, the central bank will be Open to criticism, either for intervening too late, or too early!

In theory, central banks are not obligated to help a commercial bank in difficulty according to the ‘moral hazard’ principle; historically however, central banks have intervened in most cases to prevent a run on banks under the ‘too big to fail’ principle or to prevent a panic, as witnessed during the liquidity crisis since mid-2007. Finally, central banks are also active participants in payment systems for payments between them and commercial banks and ‘open market’ purchase or sale of government bonds to implement their monetary policy.

A place of book keeping where the accounts of every bank with the central bank are maintained. It performs the functions of crediting or debiting i.e. increasing or decreasing the respective banks’ accounts with the central bank.

- **Clearing Houses** would settle at the end of the day. As the value of payments grew, reaching trillions of dollars daily, central banks became concerned that a bank could default on its obligation at the end of the day. This *intraday (or daylight overdraft) risk* could easily generate *systemic risk* ‘the risk that the failure of one participant in a transfer system, or in financial markets generally, to meet its required obligations will cause other participants or financial institutions to be unable to meet their obligations (including settlement obligations in a transfer system) when due. Central banks imposed therefore that large value transactions had to be settled gross (without netting) as they are initiated, giving birth to Real-time Gross Settlement Systems (RTGS) which debit and credit the banks’ accounts at the central bank in real-time, providing instant irrevocable finality. These systems normally process a relatively small amount of large-value payments: in the UK for instance, the CHAPS sterling RTGS system accounted in 2006 for 90 per cent of non-cash payment values (in £s) as opposed to only 0.2 per cent of the volume (number) of non-cash payments. This move to RTGS for the large-value payments resulted in dramatic changes in the way banks manage their treasury and liquidity. For a net system settling end-of-day, it suffices for the bank to have enough liquidity to settle its end-of-day net position, its short positions (amounts it owes to other banks) being reduced by its long positions (amounts owed to it by other banks).

In a RTGS system, the balance on its settlement account with the central bank will fluctuate according to the payments it sends and receives. Central banks, no longer willing to act as 'lender of last resort', will only grant credit facilities to the commercial banks against collateral, normally securities on deposit or repurchase agreements (repos), which represents an opportunity cost to the banks who cannot trade them. Payments which cannot be effected because they would breach the credit limit are queued, therefore delayed, awaiting incoming payments or a further injection of liquidity. Banks must therefore manage their liquidity carefully during the day, seeking to minimize the collateral posted to secure credit facilities.

Payment systems generally operate during pre-determined opening hours; most important is the cut-off time beyond which payments received will not be processed and are carried over until the next working day.

1.4 Importance of Payment Systems

Over the last decade and a half, operation of payment systems has generated considerable interest for the policy makers due to the increasing turnover of the payment systems, both in terms of volume and value, as well as due to the rapid technological advances in this area. It is now understood and appreciated that payment systems play a pivotal role in the financial infrastructure of the economy, is a necessary channel for monetary policy transmission and an agent that promotes economic efficiency.

1.4.1 Payment systems and financial stability

Any major payment system failure could result in failure to meet payment obligations by the system participants leading to erosion of confidence of the markets and financial structure. Similarly, adverse development in a financial market or institution will have a disruptive impact on the payment system operations. There is, therefore, a two-way interaction between stability in financial and banking markets and stability within the payment system. Bank and financial market supervisors need to communicate closely with the payment system overseers so as to ensure that, as far as possible, such problems can be anticipated and resolved at an early stage.

1.4.2 Payment systems and monetary policy implementation

In the course of maintaining monetary stability, central banks generally operate in the money market by influencing the short term interest rate which in turn would influence other rates. Alternatively, some central banks use the option of the statutory reserve requirements to achieve their monetary policy objectives. Both methods represent a market-orientated approach to monetary policy implementation thereby necessitating an active inter-bank money market and efficient forecast of liquidity conditions / requirements in the economy by the central bank. A reliable large-value payment system with same-day settlement is very much a requirement for meeting both of these conditions.

1.4.3 Payment systems and economic efficiency

If a payment system is inefficient and unreliable, it may take weeks rather than days for a payment instruction to move from the payer's bank to the payee's bank and for the final recipient's account to be credited. Such inefficiencies in the payment system are not just an inconvenience to the users, but can have an adverse impact on how the economy works. If money is "tied-up" in the payment system, then it is not available for other, productive, purposes.

1.4.4 Understanding Payment Systems and Basic Concepts

Under the Bank for International Settlements (BIS) definition, a “Payment System” consists of instruments, banking procedures, and typically interbank funds transfer systems that ensure and facilitate the circulation of money. In essence, it facilitates corporations, businesses and consumers to transfer funds to one another. A payment system normally requires:

- **A Set of Instruments** - Every payment system consists of various modes of making payment. Examples include cheque, credit cards, debit cards, E-money, Demand Drafts, Banker Cheque, Pay Order, Mail Transfer, Telegraphic Transfer, Travelers cheque etc. The adoption of new payment system depends on incentives the new payment mode provides to the customer. These instruments instruct the bank on how and where the funds are to be transferred.
- **Procedures** - After a payment instruction is initiated by the payer the back office operation of fund transfer starts. The procedures employed for the fund transfer are known as Clearing and Settlement procedures in which two or more banks participate to settle the accounts of the payer and payee under a Clearing & Settlement Agency. Most of the times, the central bank of the country or its authorized representative bank acts as the clearing & settlement agency.
- **Rules of Fund Transfer** - They are the norms or regulations which each party participating in the payment services/funds transfer should follow. Generally, all fund transfer take place electronically through the payment system network. The rules specified are the protocols or the message formats used for various types of fund transfer.

1.5 Cases of payment crisis

Risk type/detailed risk category	Event
Settlement risk: settlement member insolvency/illiquidity	'On 15 September 2008, Lehman Brothers...was placed in administration. ...Lehman Brothers' default occurred after some intraday funding via the self-collateralising repo mechanism had been undertaken by [CREST] settlement banks. This demonstrated the importance of settlement banks ensuring adequate liquidity management planning for a client default.'
Settlement risk: settlement member operational problems	'One particular [CHAPS] member had an outage that lasted most of the day on 3 January 2008, owing to an extremely rare software failure. ... Communication between members meant that they were able to stop or delay sending payments to the stricken bank, so that it did not become a liquidity sink... '
Operational risk: disasters/terrorist attack	'Following the London bombings on 7 July 2005, LCH.Clearnet Ltd was required to evacuate its head office and operate from its secondary office site.'
Operational risk: systems/network failures	'On 29 August [2006]...a software bug affecting communication between the SSE [Single Settlement Engine] and the CREST system resulted in a three hour outage. As a result, CHAPS processing had to be extended, sterling deadlines were pushed back to around 19:15, and major banks were only able to close their systems and process client accounts after 20:00.'

2 Classification of Payment System

Chapter Overview:

This chapter deals with the two major payment systems - Retail and wholesale. In this chapter we will get to know the instruments under each payment system and the basics of clearing and settlement of retail and wholesale payment systems.

2.1 Basic classification of payment system

There are several ways to classify payment systems. The simplest and most intuitive way is given below:

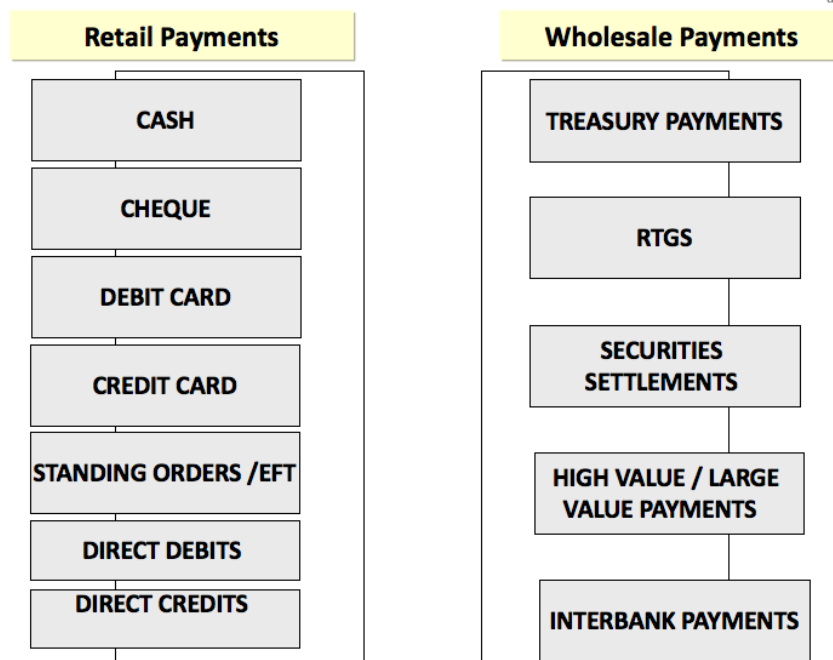
Retail Payment Systems:

- **Cheque payment systems** - ACH clearing and settlement - mostly deferred net settlement
- **Card based payment systems** - ATM Networks, Bank Card Association clearing and settlement - mostly deferred net settlement
- **Electronic payment systems** - internet banking, mobile banking - mix of deferred net settlement and real time gross settlement
- **International Remittances** - money transfers - mostly deferred net settlement

Wholesale Payment Systems:

- **Large Value Payment systems** - RTGS - inter-bank, intra bank - mostly real time gross settlement and also hybrid systems (mix of real time gross and net settlement systems)

2.2 Uses of these Systems:



2.3 Retail Payments

Retail Electronic Payments are of two types, namely:

- Electronic Credits: These follow the format: Single Debit multiple Credits
- Electronic Debits: Single Credit multiple Debits (the debit needs to be pre-authorized)

While these are classified here as Retail: these are also used by corporates to reach money to retail individuals.

These are available in each country by different names as shown in the chart below:

UK	BACS – Bankers Automated Clearing Services	EU	SDD – SEPA Direct Debit SCT – SEPA Credit Transfer
USA	ACH – Credit ACH – Debit	INDIA	NEFT – CREDIT NEFT – DEBIT
SINGAPORE	IBG – Interbank Giro (Direct Credit and Direct Debit)	HONG KONG	Clearing and Settlement of electronic items (ECG)
JAPAN	Zengin Data Telecommunication System - Zengin System	AUSTRALIA	BECS, the Bulk Electronic Clearing System

2.4 Wholesale Payments

Wholesale (Large Value) payment systems are characterized by:

Large value of each transaction - Completed in Real Time

This makes LVPS suited and preferred for securities, money markets and large value transactions.

Here are the names of LVPS by country:

UK	CHAPS	EU	TARGET2
USA	Fedwire	INDIA	RTGS
SINGAPORE	MEPS +	HONG KONG	CHATS
JAPAN	BOJ - Net	AUSTRALIA	RITS

LVPS are linked to a local economy / market. They are not Cross Border Payment Systems - though they play a part in that process.

2.5 Settlement Types:

2.5.1 Net Settlement & Gross Settlement

Participating banks can settle their payment balances with the other banks either at the end of every day or they can settle it after every payment made or received. Depending upon the frequency of the settlement of the payments, at the end of day or payment by payment basis there are two methods to settle payments:

- **Net settlement**
- **Gross settlement**

Both of these methods have their own issues and implications.

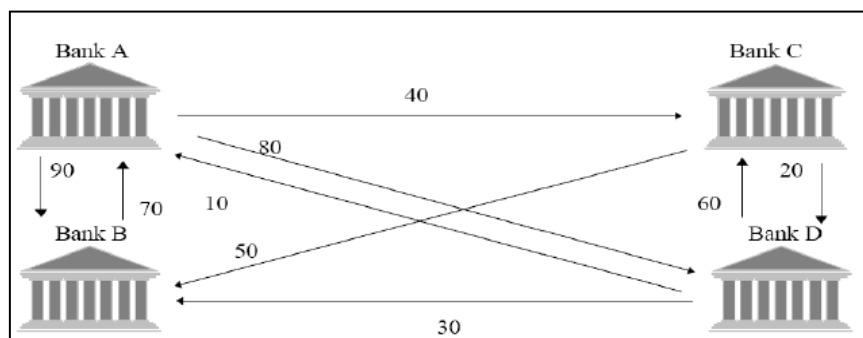
2.5.2 Net Settlement Mechanism

In the net settlement mechanism the total number of a particular bank's out payments are offset against the total number of banks in-payments i.e. as soon as the payment is made or received by a bank no actual transfer of funds takes place between the settling authority (assume central bank) and the bank instead only the entries are made into the account of the bank with RBI.

At the end of day, i.e. at the settlement time the final transfer of funds takes place which is equivalent to the net position of the bank. The process of Net Settlement can be divided into two steps, either of which may form the basis for producing the entries for posting to settlement accounts:

2.5.3 Bilateral Net Settlement

Let's take an example of banking system comprising of four banks. In it every bank deals with every bank bilaterally i.e. payments are offset between each pair of bank individually.



The diagram above shows the day long actual flow of instructions in between every pair of bank. Let's take a look at the flow of funds in a tabular form.

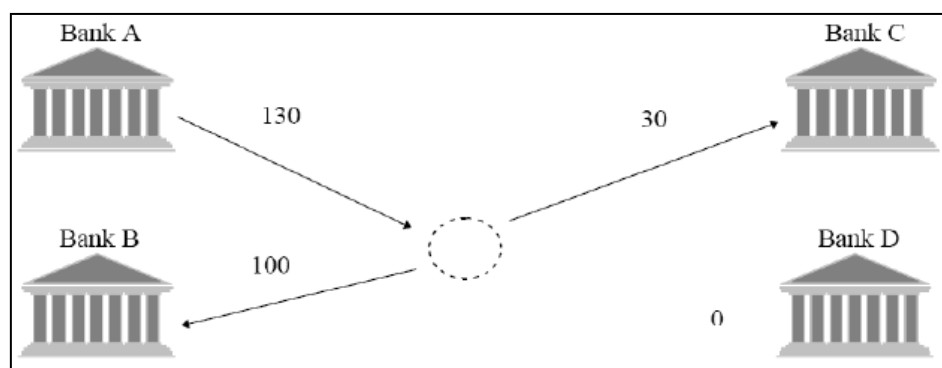
From /To	A	B	C	D
A	-	90	40	80
B	70	-	0	0
C	0	50	-	20
D	10	30	60	-

The net payment positions are calculated bilaterally for each bank. Here clearing house comes into the picture. The clearing house calculate net obligation of each bank by considering all the payments to be made to other banks individually and total payments to be received from other banks.

In other words, bilateral netting involves the offsetting of the bilateral claims and obligations between each pair of banks. In the four-bank example this means that each bank will have three separate bilateral positions with respect to the other members of the system - positions that can be either a 'net pay' or a 'net receive', or a zero net obligation

2.5.4 Multilateral Net Settlement

When bilateral net positions are calculated, then in the second step each bank in the system settles its overall net position with respect to all the other members of the system. There will only be one settlement account entry for each bank.



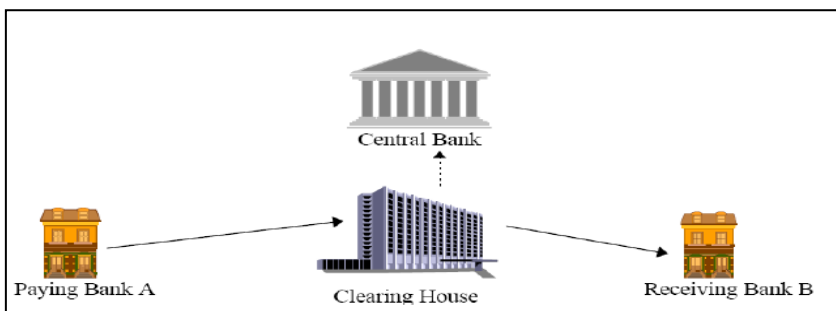
Under multilateral net settlement, Bank A is a net payer, Banks B and C are net receivers, while Bank D has a zero net position. Payment systems with multilateral net settlement usually operate through a clearing house, a central location through which the payment instructions pass and which is responsible for calculating the multilateral net positions of the member banks and passing them on to the central bank for posting to the members' settlement accounts.

This leads naturally onto the question of the timing of settlement. A netting operation requires the collecting together of details of in and out-payments submitted over a specified time period - often a whole business day, although it may involve shorter, more frequent periods. There is thus a delay between the initial submission of the payment instruction and the settlement across the accounts at the central bank. Indeed, it may be the case that payment instructions pass through the clearing house and on to the receiving banks before settlement takes place. This has important implications for the risks in payment systems.

2.5.5 Role of clearing houses in Settlement

Lot of calculation is needed to come up to the final net payable or receivable position of each participant. Question arises that "who on the behalf of every bank carries out these calculations", it is the clearing house which determines everybody's net funds payable or receivable positions before passing on the result to the central bank.

The thing which is to be kept in mind that it's not the clearing house which also holds the accounts of every participating bank with it. This is the task of central bank; clearing house just passes the information to the bank that how much is to be settled by which bank.



Things to be noted here are:

Payment system clearing houses can take a variety of forms. They may be owned and operated by the central bank itself, or by the commercial banks, or by a combination of the two. They may be designed to handle either paper or electronic/automated payment instructions, or both. With electronic payments, the clearing house may process them in batches, or in real-time as each instruction arrives. The latter alternative enables the clearing house to monitor banks' net positions on a continuous basis - important if there is a structure of limits in place.

They may be organized to serve the whole country, or on a regional basis within the country. The latter may be useful in countries with poor communications and transport infrastructure, or where there are large distances between centers of population and activity. In such cases, the settlement accounts of the banks in the regional/local clearing house may be held at the local branch of the central bank. Clearing houses may be owned and operated by central bank.

2.6 Key Learnings:

- Need for Payment systems - The need for payments arises from commercial transactions of various types. Payment is the “delivery of money” making it a critical component of a commercial transaction.
- Role of Payment systems in the economy
- Financial stability
- Monetary policy implementation
- Economic efficiency
- Payment system participants
- RTGS system - handle a small amount of large value payments, settle payments one-by-one gross through the settlement accounts held with the central bank
- Important requirements of Payments
- Classification of Payment systems
- Settlement types

2.7 Test Your Understanding

1. A clearing house reduces the settlement risks by _____.
 - a. By netting offsetting transactions between multiple counterparties
 - b. By requiring collateral deposits (also called Margin Deposits)
 - c. By providing independent valuation of trades and collateral
 - d. By providing a guarantee fund that can be used to cover losses that exceed a defaulting clearing firm's collateral on deposit
 - e. All the above given options
2. Which of the following is not a part of the payments ecosystem?
 - a. Central Bank
 - b. Clearing House
 - c. Finance Ministry
 - d. Member Banks
 - e. Households and Firms
3. There are different Clearing Houses for different methods of payment.
 - a. TRUE
 - b. FALSE
4. Which of the following is valid in Clearing and Settlements?
 - a. Settlement must happen at any cost
 - b. Settlement can happen only if Clearing is successful
5. Clearing & Settlement as it exists in Payment Systems and as it exists in Securities Systems is identical in its operation.
 - a. TRUE
 - b. FALSE

3 Retail Payment Systems

Chapter Overview:

This chapter is designed to help the participants get a sound understanding of Retail Payment Systems. Specifically, you will learn about Paper check and their processing, Intra and Inter Bank cheques, the role of clearing, MICR Cheques, Check 21, remote creation of checks, digitization of paper cheques, electronic payment transactions, ACH network and processing, Credit and Debit Cards etc.

3.1 The Payment Process

In Transaction Processing, as in any process, there is an Input, a Process and an Output. For the Process to produce the desired Output the Input to the Process needs to be complete and exact. It is possible (necessary) to spell out the precise inputs needed. Then it becomes possible to get it “Right First Time”. In the context of Payments it is worth noting that the Input and the Process is specific to the payment method being used.

3.2 Paper Checks

In the case of paper cheques the instruction to the bank is written by the customer on the face of the check!

- You hold money in your bank
- You need to make a payment to someone
- You write a letter to your banker asking him to pay that amount to Mr. Seller
- Mr. Seller takes the letter you wrote to your banker
- The banker, recognising your signature, gives the amount to Mr. Seller

The letter you wrote to your banker giving him the instruction to take money from your account (permission to debit you) and give it to a third party is the cheque (cheque).

Quite often Mr. Seller will not directly go to your bank. He will ask his bank to take the letter and show it your bank. That is the paper clearing system.

NOTE: this is not a legal description of the check as an instrument. It functionally describes how a cheque operates.

3.3 Processing the Check

This input from the customer in the form of the cheque gets processed by the bank: it follows those instructions exactly

- **Input:** The cheque
The cheque is written by the Payer. But it is brought to the bank by the Receiver. In that sense the input from the Payer is brought to the bank by the Receiver.

Process:

- Ensure the cheque is duly signed
- Ensure there is money in the account
- Verify the date
- There should be no alterations on the cheque

- **Output:** Transfer of funds
Money moves from Payer’s account to the Clearing House through its banker; thence to Receiver’s account. The output of the process is: “Debit the Payer.”

In contrast to the source of the Input in the case of cheques, the source of inputs/instructions for all electronic payments is the Payer.

3.4 Basics of Cheque clearing process

Paper based instruments like cheques; demand drafts are very important constituents of a nation's payment systems. Hence it is very important to know how the paper based instruments are cleared and settled. However, with the advent of payment cards, paper-based instruments have seen a decline but still they are an integral part of the payment system. The introduction of MICR (Magnetic Ink Character Recognition) technology brought about a revolution in cheque clearance and settlement during the mid-eighties and early nineties. Although other revolutionary techniques like E-check and Cheque Truncation are now in the phases of trial and testing, MICR forms the backbone of cheque clearing mechanisms in India and rest of the world.

3.4.1 The Basics of Cheque Clearing Process

- The customer (payee or holder) deposits the cheque that he has received from the Payer drawn in his favor with his Bank.
- The payee's bank processes the cheque and sends it to the clearing house along with other cheques that it has received for clearing purposes.
- At the clearing house the cheques are sorted bank-wise and all the banks (drawee banks) collect the cheques that are drawn on them (the cheques for which they have to make payment).
- The Drawee banks process the cheques and validate them for details like signature, availability of amount in the customer's account and so on.
- The Drawee banks communicate the fate, (i.e. if the payer's account has sufficient funds to honour the payment or not, if the signatures matching or not), of the cheques to the clearing house within the time frame as specified by the clearing house.
- With this information, the payee banks either credit the customer's account with the cheque amount or return the unpaid cheque to the customer.

The Diagram below depicts the cheque clearing process:

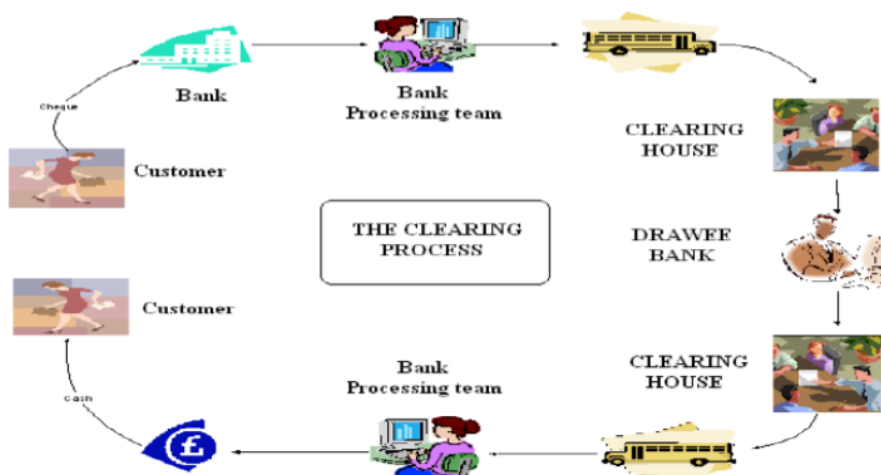
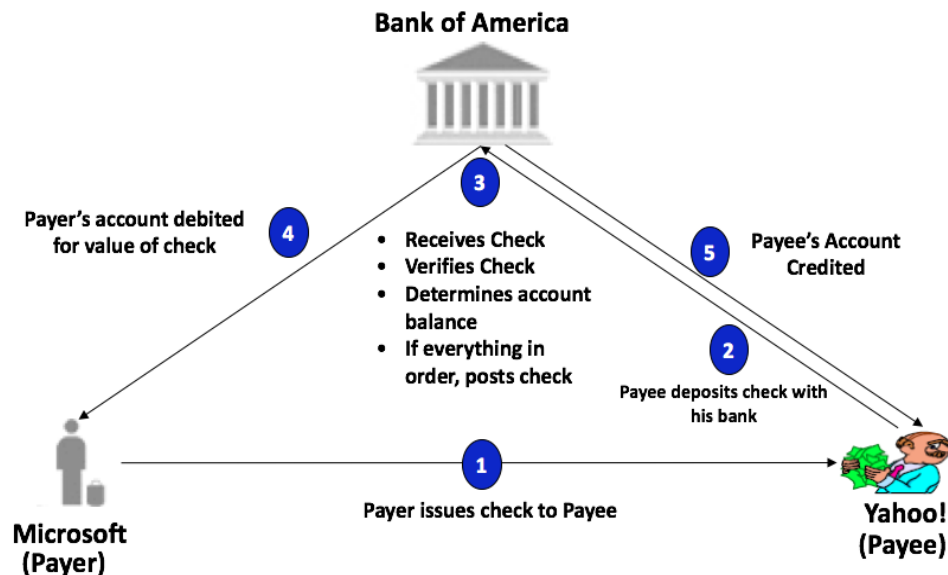


Figure: the process of cheque clearing

3.4.2 Processing - When both parties bank with same banking institution

This is an intra-bank movement of funds. Sometimes it is also called a house transfer or a book transfer. The process flow is depicted in the chart below:



Life would be so simple if all of us had our accounts with only one Bank

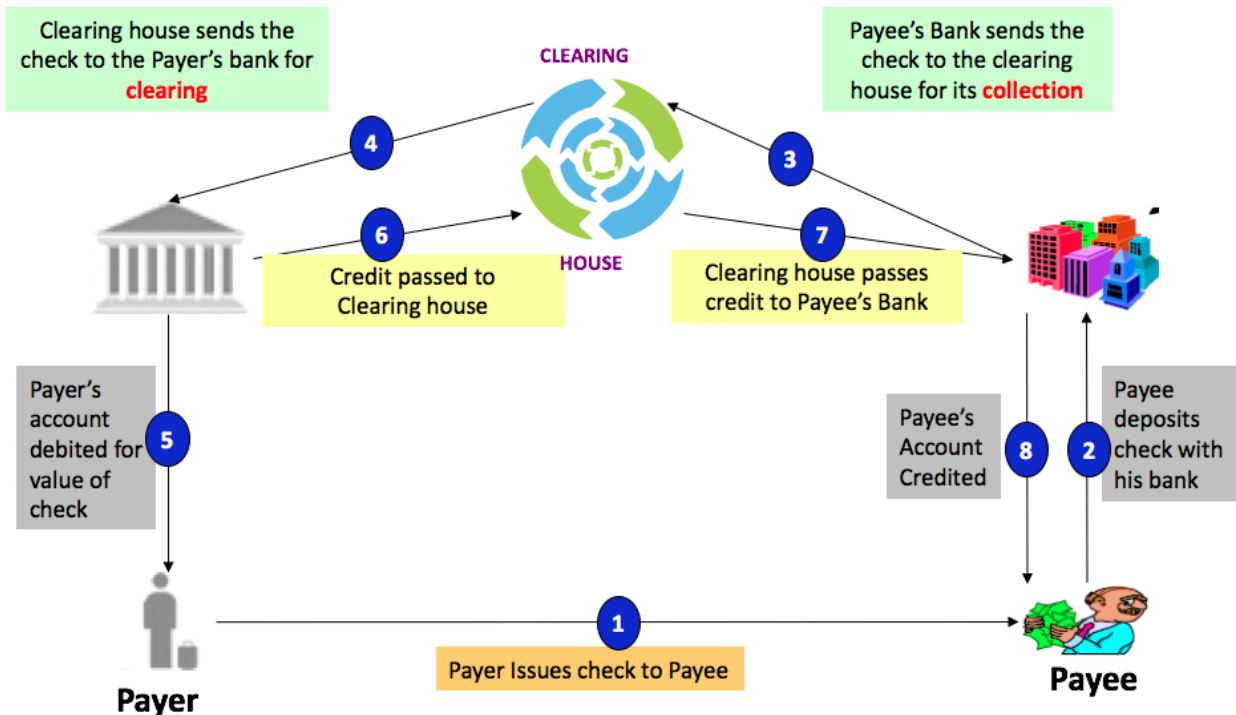
But life is never simple

- There are thousands of banks spread across the globe, and
- The Yahoos, Microsoft, Tata's and the Fords of the world have their accounts with different banks, and
- Money constantly changes hands across this vast network

So how does this **inter-bank** movement of funds take place?

3.4.3 The Clearing House

When checks go from one bank to the other for clearing, the clearing house enters the picture and is needed for Clearing & Settlement of Funds. This is called Inter-bank clearing. While presented here for the clearance of checks, Inter-banking clearing and the involvement of a Clearing House is to be found for all other payments as well, so long as money moves from one bank to another.



In order to sort checks by Payer bank and then re-sort them when amounts are received back, they need encoding so that the process can be automated.

This led to the evolution of the MICR Coding.

i. Mechanized Cheque Processing based on MICR

It is defined as the machine recognition of numeric data printed with magnetically charged ink. It is used on bank cheques and deposit slips. MICR readers detect the characters and convert them into digital data. This technique is useful to accelerate the check routing process as also to route the check back to the location where the funds exist and to settle the transaction in minimum time.

Cheques were processed manually until the rapid increase in their use after the Second World War necessitated the introduction of a reliable automated method of cheque processing. This growth was most marked in the USA, and the American Bankers Association (ABA) in 1956 adopted a process of Magnetic Ink Character Recognition, or MICR, which was developed jointly by the Stanford Research Institute and General Electric Computing Laboratory. MICR is standardized by ISO 1004. The MICR proofing systems have also developed since the early 1960s to incorporate scanning technology and advanced optical character recognition techniques to improve the automation of document processing.

This technology, known as "Image Processing" provides the means for converting the image of documents into a digitized format suitable for electronic processing and storage. The data contained in the MICR code line is still predominantly captured magnetically. MICR cheque processing was introduced by the Reserve Bank of India first in Mumbai and Chennai in 1987 and was implemented in 1988 in Delhi to be followed by Kolkata in 1989.

Following were the factors responsible for the adoption of MICR technology:

- Increasing clearing volumes
- Faster realization of cheques
- Better control over clearing reconciliation
- Use of state-of-the-art technology in cheque clearing
- The availability of cheque-wise data on instruments processed in clearing
- The facility to store, retrieve, and group data on clearing instruments with the aid of the computer systems used for the MICR processing
- The capability to provide data in a meaningful manner enabling further analysis.

A. Advantages and disadvantages of MICR

Advantages:

- MICR systems are secure against most common types of defacements like overprinting, dirt or writing across numbers
- A layer of transparent adhesive tape over the numbers does not prevent desirable results
- Imprinting with magnetic ink is highly durable and can withstand thousands of transits across the read-head with no impairment of the signal
- Documents are difficult to forge
- Reduces human errors.

Disadvantages:

- Highly stylized font required to ensure character discrimination
- Limitation to numbers and only about four other characters
- Difficulty in scanning with hand held device
- A very shallow depth of field
- MICR readers and encoders are expensive.

3.5 Check 21 - an overview

In the year 2000, Federal Reserve Board (FRB) started working on improvement of the processing of checks in U.S in accordance with the changed scenario (to suit the needs of the 21st century). Fed mainly focused on promotion of check truncation, and electronic check presentation. The final outcome of their endeavor was “Check clearing for the 21st Century Act” (popularly known as Check 21). The main idea was to come up with a machine readable copy of a check (a substitute check) for traditional check for forward collection or return.

Substitute checks that meet the requirements of this act would be legal and practical equivalent of the original check. Check 21 allows banks to create and process a substitute check, also known as an **Image Replacement Document** (IRD) in lieu of an original check. Its purpose is to improve the speed and reliability of the check-clearing process by taking as much of the paper out of the process as possible. It helped develop the **Substitute Check** that is the legal equivalent of the original check and it is the electronic copy or image of the original check.

3.5.1 Highlights of the Check 21 act

Main purposes of Check 21 are

- To facilitate check truncation
- To develop innovation in the check payment without mandating the payment of check in electronic format
- Overall improvement of the payment system.
- **This act created a new negotiable instrument called “substitute check”**
 - If this substitutable check meets the criteria of the act then it is legally substitutable to the paper-written traditional check
 - This substitute check can be processed similar to the paper check
 - Involved Parties cannot refuse to accept these substitute checks if they follow all the requirements by the act “Parties” involve all the banks, Federal Reserve, consumers, customers and other financial services institutions.
- **The act provides legal equivalence only for substitute checks.**
 - The act provides check truncation and electronic image/ exchanges but does not provide legal equivalence for electronic check or image presentment
 - Check clearing services where electronic checks are used, require the agreement of the parties who are accepting the electronic form of the instrument for value
 - This act encourages the use of electronics to the empowering banks to truncate the original checks, and give paper checks where necessary.

All checks except foreign checks are eligible to become substitute checks, some of the following which can act as substitutable checks are

- Consumer checks
- Business checks
- Corporate checks
- Government warrants
- U.S treasury checks
- Money Orders
- Control disbursement checks
- Payable through drafts
- Traveller’s checks.

3.5.2 Difference in Process for Check21 compared to conventional clearing:

The only difference is in the manner the receiver’s bank sends the instrument to the payer’s bank: the image is transmitted rather than the physical instrument being dispatched. All other aspects of clearing are identical where Check21 is used.

3.5.3 Remotely Created Checks

Quite often a customer has to:

- expedite payment to a creditor
- make a purchase via telephone or Internet
- compensate a merchant for a returned check
- establish a payment plan with a collection agency

How does the Customer Pay in these Situations?

- Originate a remotely created check
- What is a remotely created check?
 - Created remotely by a payee
 - Under the authority of the account holder
 - Does not bear the account holder's signature
 - Is a paper instrument with its negotiability intact
 - Is processed through the regular banking channels
- So is there any difference between a remotely created check and the regular check at all?
 - A remote check is created by the Payee while the regular check is created by the Payor

The check does not bear the drawer's signature; instead the signature line displays the drawer's name or some other words referencing the drawer's authorization to create the check. See the image below of a remotely-created check:



ACCOUNT HOLDER
233 SOUTH WACKER DRIVE
CHICAGO, IL 60606

JPMORGAN CHASE BANK NA
063-898652831

1202901608

DATE 4/22/2008

PAY TO THE ORDER OF WWW.NBCHECK.COM \$ 3.40

THREE DOLLARS AND 40 CENTS DOLLARS 1

7021-1
500100 2206766

ORDER NUMBER: 468805
CUSTOMER SUPPORT: WWW.NBCHECK.COM
EMAIL: SUPPORT@NBCHECK.COM OR 866-557-2455
TRANSACTION ID: 120290160855

PRE-AUTHORIZED CHECK
NO SIGNATURE REQUIRED

⑈ 1202901608⑈ ⑆ 263189865⑆ 759815380⑈

3.5.4 How are these Checks Created?

Payer step:

Payer grants payee authorization to produce a remotely created check on his account

Payee steps:

- Payee obtains MICR line info
- Creates an electronic template of a check or a paper check
 - The payee or a TPP acting on behalf of the payee can create this
- Deposit the remotely created check with its bank for collection
- The item then follows the traditional collection process - Paper-based or Image-based or ECC

3.6 Regulations that govern these processes

Anything can be developed and automated. But the law needs to be there to protect the interests of all concerned where a dispute arises.

In the case of checks many of these are contained in Regulation CC.

3.6.1 REG CC 229.34 (d)

“If paying bank claims that the IMAGE does not match the original issuance of the check by the issuer of the check THEN

The Depository Bank can prove that it warranted correctly by showing the customer of the Paying Bank to have been negligent in forgery prevention.”

3.6.2 REG CC 229.51

A substitute check ... has the same legal status as the original check. (Substitute checks arise when the image is reprinted for any reason or requirement.)

3.6.3 REG CC 229.51

The substitute check shall accurately represent all of the information on the front and back of the original check as of the time the original check was truncated; and (2) bear the legend, “This is a legal copy of your check. You can use it the same way you would use the original check.”

3.6.4 REG CC 229.54

If a customer claims his account was wrongly debited for a substituted check, the customer must make the claim on the Paying Bank: Within 40 days

If made orally, and bank then requires it in writing, if the oral claim was made in 40 days that is good enough
This is called a “Claim for Expedited Re-credit” The claim may be treated as “Valid” and credited; or NOT Valid

3.7 Promoting the Digitization of Paper Checks

Even as electronic retail payments gather momentum, the issuance of checks is a deep-rooted habit in the USA. While individuals continue to issue checks, it is not necessary that the payment system handle this as paper. Various rules enable what starts as paper to be processed electronically.

Here are the ways in which that happens:

ARC: Account Receivable Conversion: Check deposited by my customer: present it through ACH as an Electronic Debit

BOC: Back Office Conversion: Customer pays by Check at checkout counter of store. Informed that debit will be through ACH. Check processing done EOD in a back office, or consolidated for processing regionally/ centrally

POP: Point of Purchase: Customer pays by Check at checkout counter of store. Check is scanned at POP thru a MICR scanner. Debit raised through ACH. Customer may decline this process.

RCK: Re-Presentation Check Entry: ECP of a check previously returned. It can be a single-debit ACH instruction; value less than USD 2,500/-.

The data is unmistakable about the decline of checks through actions of various governments and agencies. This is seen in the BIS data which is released annually. The latest one is shown below:

	Cheques					E-money payment transactions				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Australia	256.4	224.4	194.4	166.6	139.5	nap	nap	nap	nap	nap
Belgium	6.5	5.4	4.3	8.5	9.5	50.5	46.2	29.4	28.5	7.0
Brazil	1,590.2	1,439.3	1,297.0	1,164.8	1,018.0	37.4	36.0	38.1	27.8	24.4
Canada	870.9	805.5	761.1	708.9	648.2	nav	nav	nav	nav	nav
China	846.7	783.7	693.4	578.2	417.0	nap	nap	nap	nap	nap
France	2,971.4	2,805.6	2,620.6	2,482.8	2,238.9	46.5	52.2	50.5	52.9	36.5
Germany	40.6	34.4	31.3	29.9	21.2	35.9	33.6	31.8	34.2	31.6
Hong Kong SAR	nav	nav	nav	nav	nav	nav	nav	nav	nav	nav
India	1,341.9	1,313.7	1,257.3	1,195.8	1,096.4	30.6	66.1	133.6	310.7	748.0
Italy	291.6	275.7	252.4	231.5	208.6	151.9	191.2	244.0	291.4	373.9
Japan	82.6	77.5	73.1	68.9	64.1	2,342.0	2,836.6	3,453.4	4,235.4	4,827.7
Korea	612.9	460.1	364.3	310.3	254.0	113.1	69.6	47.9	38.8	33.3
Mexico	398.3	377.5	348.3	330.5	311.5	nav	nav	nav	nav	nav
Netherlands	nav	nav	0.2	0.2	0.2	171.7	148.0	121.2	76.2	2.4
Russia	0.0	0.0	0.0	0.0	0.0	106.2	225.7	564.4	1,013.6	1,075.4
Saudi Arabia	7.1	7.1	7.1	6.8	6.7	nap	nap	nap	nap	nap
Singapore	76.8	74.6	72.2	69.4	65.7	2,888.2	3,015.1	3,085.3	3,138.1	3,233.0
South Africa	53.7	42.2	30.9	22.9	16.9	nap	nap	nap	nap	nap
Sweden	0.4	0.2	0.1	0.0	0.1	nap	nap	nap	nap	3.5
Switzerland	0.3	0.3	0.2	nav	nav	10.6	2.8	1.4	nav	22.5
Turkey	18.2	18.5	17.2	17.4	16.9	nav	nav	nav	nav	nav
United Kingdom	970.0	848.0	718.0	644.0	558.0	nav	nav	nav	nav	nav
United States	20,378.0	18,334.5	16,319.7	14,338.9	12,287.1	nav	nav	nav	nav	nav
CPMI¹	30,814.4	27,928.0	25,063.1	22,376.3	19,378.6	5,984.7	6,723.3	7,800.9	9,247.6	10,419.2

Please refer to the individual country tables for a detailed explanation.

¹ Sum or average excluding those countries for which data are not available. For credit transfers, data for France (prior to 2005) and the United Kingdom include interbank transactions; however, the total number is relatively small.

3.8 Electronic Payment Transactions

The defining difference - whether retail or LVPS is as follows:

- It is payer initiated
- Payer needs to give its bank substantial key information about the receiver
- This includes receiver bank details
- For this the receiver must send the information to the payer in the first place
- This information has to be complete and exact
- Neither payer nor receiver may be a bank and may not know enough about payments to ensure accurate data

If a payment related to a **Settlement Obligation** is initiated and it **FAILS** due to lack of proper details of the **RECIPIENT**: it constitutes **Settlement Failure**. This is **NOT** a failure of the **Payment System**. It is a failure of the **Settlement Obligation** under the **Trade** between **Counterparties** in the **Markets**.

A payer initiated system then becomes a “push” based system as the payment is pushed through.

Check systems are “pull” systems because the receiver pulls the money in.

The following electronic “push” systems are for “large value payments”:

 Fedwire	US, electronic, the payment happens in “Real Time”; instantaneously unless there is gridlock. In the Clearing house the settlement system is on a “Gross” basis.
 RTGS	In India. RTGS stands for “Real Time Gross Settlement”.
 CHAPS	In UK.
 HVCS / RITS	In Australia: HVCS operates for large value transactions. RITS is similar: excepting that all other payments are aggregated into RITS and interbank settlement is thru RITS

Let’s keep our focus for now on Retail.

3.8.1 The ACH Network - USA

The Automated Clearing House (ACH) is a network for electronically exchanging funds and related information among individuals, businesses, financial institutions, and government entities. ACH rules and regulations are established by the National Automated Clearing House Association (NACHA). Private ACH operators and other local and regional ACH associations provide input into the rules.

The payments transferred over the ACH have represented recurring credit payments intended for the accounts of the receivers. Typical payments are salaries, consumer and corporate bill payments, interest and dividends, and Social Security and other entitlement programs originated by the U.S. Treasury. The ACH has the ability to process large volumes of payments efficiently and to allow an originator to debit the banking account of the payer because of which it is increasingly used for other types of payments, such as insurance premiums, purchases of stock, and consolidation of corporate cash balances also.

3.8.2 The ACH Network

The Federal Reserve is the principal ACH operator, distributing ACH transactions through Fedline. There are also over 20 private sector operators, such as EastPay, Inc., Mid-America Payment Exchange, Visa U.S.A., Payment Resources One, and Western Payments Alliance.

All participants in the network fall into one or more of these six categories:

- **Originator** - The Originator is the entity that agrees to initiate ACH entries into the payment system according to an arrangement with a Receiver. The Originator is usually a company directing a transfer of funds to or from a consumer or another company's account. In the case of a consumer-initiated entry; however, the Originator may be an individual initiating funds transfer activity to or from his or her own account.
- **Originating Depository Financial Institution (ODFI)** - An institution that receives the payment instruction from the Originator and forwards the entry to the ACH operator. A DFI may participate in the ACH Network as a RDFI (see below) without being an ODFI; however, if a DFI chooses to originate ACH entries, it must also agree to act as an RDFI.
- **ACH Operator** - A central processing facility operated by the Federal Reserve Bank or other private sector organization. The operator receives electronic entries from ODFIs and distributes entries to the appropriate RDFIs (see figure 9.5 below), and performs the settlement functions for the affected financial institutions.
- **Receiving Depository Financial Institution (RDFI)** - is a financial institution, which receives ACH entries from the ACH Operator and posts to the receiver (depositor) account.
- **Receiver** - An individual or organization, which has authorized an Originator to initiate an ACH entry to the Receiver's account with the RDFI.
- **Third Party Processor** - A third party processor may serve as an agent for an ODFI or RDFI. The ODFI and RDFI are still responsible for compliance with ACH rules and regulations.

3.8.3 ACH System Operations

The ACH system supports both credit and debit transactions. In credit transactions, funds flow from the Originator's account through the ODFI to an account held by the receiver at the RDFI. For ACH debit transactions, the funds flow from the receiver's account at the RDFI through the ODFI to the account of the Originator.

A. ACH credits and debits

ACH transactions are a common form of electronic funds transfer used to make both recurring and non-recurring payments. Depository institutions originated 6.8 billion ACH transactions during 2000 for themselves and their customers, twice as many as were initiated during 1995. ACH payments may be either credit or debit transactions. In an ACH credit transaction, funds flow from the originator to the receiver, and in a debit transaction, funds flow from the receiver to the originator. ACH credit payments include direct deposit of payrolls, government benefit payments and corporate payments to contractors and vendors.

The proportion of payroll payments made by businesses using the ACH was 50% in 2000. Debit payments include mortgage and loan payments, insurance premium payments, consumer bill payments and corporate cash concentration transactions.¹³ In addition, businesses and individuals may use the ACH to make payments to, or receive reimbursement from, the federal government related to federal tax obligations.

Examples of ACH Credits

- Payroll direct deposits
- Social Security payments
- Dividend and interest payments
- Corporate bill payments to customers

Examples of ACH Debits

- Insurance premium collections
- Mortgage and loan payments
- Consumer bill paying
- Corporate cash concentration

ACH data transmissions always flow in the same direction i.e. are unidirectional- from Originator to the ODFI to the ACH operator to the RDFI. This is true whether the item is a debit or a credit. For credits, the ODFI's settlement account is debited and the RDFI's settlement account is credited. For debits, the ODFI's settlement account is credited and the RDFI's settlement account is debited.

Here are the types of payments for which ACH is used:

 Direct Deposit	Payroll, Social Security, Dividends
 Direct Debit	Utility payments, mortgage payments
 Point-of-Purchase	Enables conversion of a consumer check to an ACH by the merchant with consumer authorisation at point-of-purchase.
 Account Receivable Conversion (ARC)	Facilitates conversion of consumer checks received at lockboxes to ACH on the presumption that the issuance of a check is an "authorization to debit".
 Telephone Initiated (TEL)	One-time consumer debits initiated via a phone call and authorized by the consumer.
 Web-initiated	Consumer authorizes debit via the internet.
 Cash Concentration Disbursement (CCD)	Debit and credit entries to corporate accounts.

B. ACH Credits

The ACH Credit is a ONE-to-MANY system.

One entity makes payments to a large number of others.

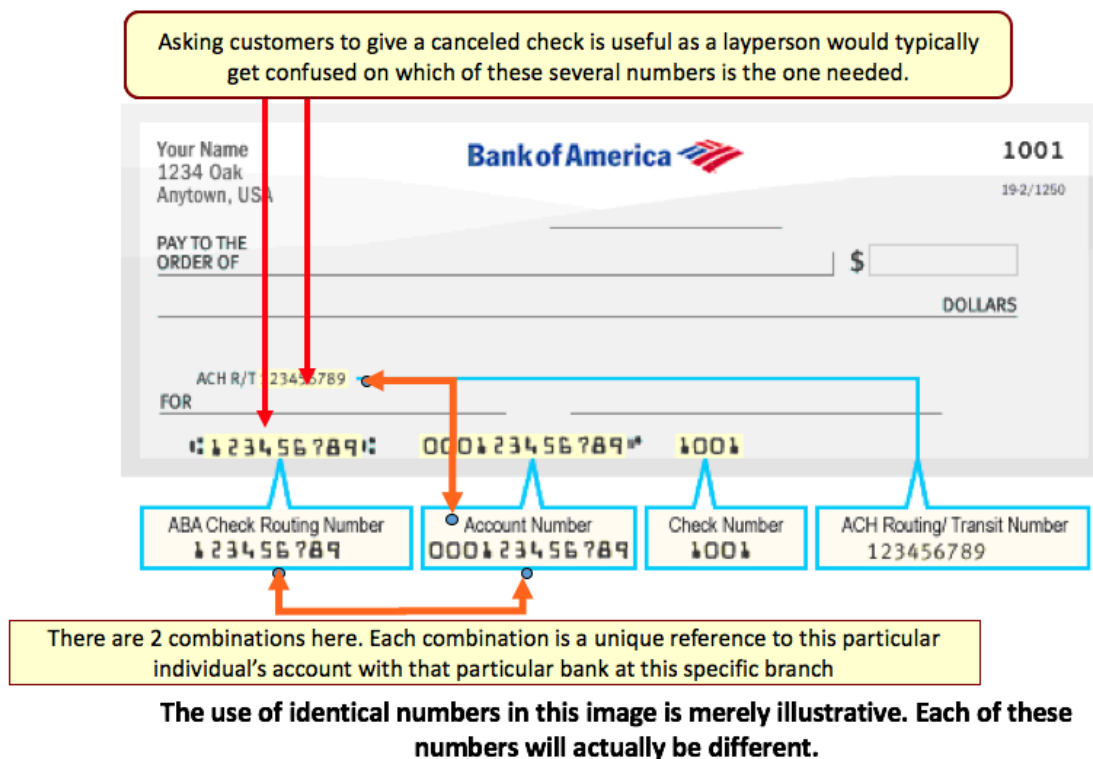
Good examples of this usage:

- Paying rent
- Paying dividends
- Paying salaries
- Paying pensions

- The Beneficiary Bank **has to be** a NACHA member else recipient **cannot** receive funds by Direct Deposit
- Any mistake in providing the ACH Routing number will cause a mismatch: at that particular Beneficiary Bank location the account number might not exist.

To make sure that the data is captured correctly, the traditional method is to ask for a cancelled check from the intended receiver of funds and extract information from that.

Here is mapping that helps link the information on a check to the ACH Routing number that is so vital for making payments:



The following are the steps for ACH origination:

- The Originator (individual or business account holder) initiates a payment order to the ODFI
- The ODFI transmits the payment information to the ACH operator
- The ACH operator receives data from the ODFI and sorts the entries by routing number
- The entry is transmitted to the RDFI
- The RDFI receives, processes, and posts the ACH data to the receiver account on settlement day.

ACH return items flow from the RDFI to the ACH Operator to the ODFI. The ODFI must notify the Originator of return items. Third party processors may become involved at any step in the process. They may prepare files and send them to the ACH Operator on behalf of ODFI or they receive them on behalf of the RDFI. Regardless of the role third party processors play, the responsibility for rules adherence and liability falls on the appropriate financial institution using the third party processor.

C. ACH Debits

No customer's account be touched for funds without prior authorization. When a banker debits the customer for charges, this prior authorization had already been signed in the "Business Conditions" that are part of the account opening documentation.

ACH Debit involves pulling money from the account of payers. This has to be pre-authorized.
 Good examples of usage are:

- Insurance payments
- Electricity, water, phone and other utility bill payments

The following are the steps for ACH Debit:

- The service provider (to whom payment has to be made) collects debit authorization from each client
- The debit authorization is also addressed to the banker of the payer
- The bank takes note and updates systems for the debit which will eventually come
- The service provider will electronically send bills to the customers and to their banks
- The banks operating the prior authorization will raise debit on customers through the ACH
- Amounts will be debit to customer account and credited to service provider's bank account

See the routing data across the USA for Bank of America as an example:

Bank of America Routing Numbers			
States	Ordering Checks	Direct Deposit	Wire Transfer
Northern California	Retail		LVPS (USA: Fedwire)
Southern California			
Illinois		081904808	026009593
Eastern Florida	063000047	063100277	026009593
Western Florida	063100277	063100277	026009593
Georgia	061000052	061000052	026009593
Maryland	052001633	052001633	026009593
Nevada	122400724	122400724	026009593
Northern Texas	111000025	111000025	026009593
Southern Texas	113000023	111000025	026009593
Washington	125000024	125000024	026009593

Routing numbers for Checks: can be different for the same state	Routing numbers for ACH: different for different states	Single Routing Number across USA
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Routing numbers are called differently in different countries. Their field length may also be different. Here is a tabulation of that:

UK	CHAPS	"Sort Code" (6 digits)	EU	TARGET2	"IBAN: BICplusIBAN"
USA	Fedwire	"Routing Number" (9 digits: one nationwide number)	INDIA	RTGS	"IFSC Code" (11 alphanumeric characters)
SINGAPORE	MEPS +	"MEPS Account Code" (4 digits)	HONG KONG	CHATS	"Clearing Code" (6 digits)
JAPAN	BOJ - Net	"Zengin Code" (7 digits)	AUSTRALIA	RITS	"Bank State Branch Number" / "BSB" (6 digits)

3.9 Credit Cards as a Retail Payment System

3.9.1 Card accounts:

A credit card account allows a customer to purchase goods and services from any merchant who has entered into an arrangement with the card issuer. The card issuer acts as a third party, guaranteeing payment to the merchant and recovering the resulting debt directly from the borrower. In return for this payment guarantee, the merchant pays a fee, usually between 1 and 4 per cent of the value of the goods. The card issuer allocates each borrower a maximum credit facility, or credit line, up to which they can spend without the need for further negotiation.

Credit card accounts represent one of the most complex forms of consumer credit agreement, and the detail of their operation is not well understood by a large proportion of users. This is mainly because of subtle differences in the way different lenders calculate interest and apply charges, with different rates and charges applied to different parts of the balance depending on whether it originated from a balance transfer, retail purchase, cash withdrawal or some other type of transaction.

Most credit card accounts represent an unsecured form of credit. However, some lenders, particularly in the US, will offer high risk customers credit cards secured against cash deposited in an account controlled by the credit card issuer. The credit line on the card is then set to be equal to the value of the deposited funds. After the customer has demonstrated good repayment behaviour for a period of time, the issuer may allow the account to transfer to an unsecured status with the credit limit increased beyond the value of the secured funds.

If the merchant makes a sale of 100, it receives only this value less a discount amount. If we assume that to be 3/- ; this 3 is shared between issuing bank, POS machine bank and the interchange company.

The interest charges on the credit card outstanding are for the loan given and belong completely to the card issuing bank.

3.9.2 Steps in the Card Process:

- Bank issues customer a credit card after a credit assessment process
- Bank updates card information on the database of the interchange company: Visa / MasterCard
- The customer receives the card with pin to operate it
- Customer uses the card at a merchant location
- The pin / charge slip signed indicates satisfactory receipt of product / service
- The merchant sends charge slips to interchange company to receive funds
- The interchange company sends data to the bank
- The bank bills the customer
- The customer repays card balance as per convenience and within terms of the issuance of the credit card

3.10 Debit Cards

Everyone that opens a checking account at the bank receives a linked debit card. It operates similar to the credit card with the following differences:

- There is no lending involved in debit cards: therefore no credit risk
- Interchange fees are lower
- The legal framework for debit cards and credit cards are different
- A debit card transaction will fail if there is no bank balance in the linked checking account
- Legal protection for merchant failures are more in credit card than in debit cards

3.11 Key Learnings:

- Paper Checks - This input from the customer in the form of the check gets processed by the bank: it follows those instructions exactly
- The Cheque clearing process
 - When both parties bank with the same bank
 - When both parties bank with different banks
- Role of Clearing house in Check clearance
- Mechanised cheque processing in MICR - This technology, known as “Image Processing” provides the means for converting the image of documents into a digitized format suitable for electronic processing and storage
- Advantages & disadvantages of MICR
- Check 21
- Check 21 allows banks to create and process a substitute check, also known as an **Image Replacement Document (IRD)** in lieu of an original check. Main purposes of Check 21 are
 - To facilitate check truncation
 - To develop innovation in the check payment without mandating the payment of check in electronic format
 - Overall improvement of the payment system.
- Remotely created Checks
- Regulations governing the process of check clearances
- Electronic Payments
- ACH Networks
- ACH Credits and Debits
- Credit Cards in Retail Payment Systems
- Debit Cards

3.12 Test Your Understanding

1. Payment systems are _____.
 - a. Only Physical
 - b. Only Electronic
 - c. Can be Physical or Electronic
 - d. None of the given options
2. Which of the following is not a part of the payments ecosystem?
 - a. Central Bank
 - b. Clearing House
 - c. Finance Ministry
 - d. Member Banks
 - e. Households and Firms
3. Which of the following is valid in Clearing and Settlements?
 - a. Settlement must happen at any cost
 - b. Settlement can happen only if Clearing is successful
4. Payment and settlement systems are a core element of the financial infrastructure at _____ level.
 - a. National
 - b. International
 - c. Both A and B
 - d. None of the given options
5. Which of the following transactions involve ACH direct debit transfers?
 - a. Payments on insurance premiums
 - b. Mortgage loans
 - c. Utility Bills
 - d. All of the given options
6. For ACH Debit which of the following is necessary?
 - a. Remitter-s Bank has to be a NACHA member
 - b. Recipient-s Bank has to be a NACHA member
 - c. Both sending and receiving banks have to be NACHA members
7. Which of the following is not a type of ACH payment?
 - a. Direct Deposit
 - b. Direct Debit
 - c. Real-time Gross Settlement
 - d. Point-of-Purchase
8. In electronic payment methods- the instruction to pay is initiated by _____.
 - a. The Payee
 - b. The Payer
 - c. The Payee-s Bank
 - d. The Payer-s Bank

4 Introduction to Large Value Payment Systems

Chapter Overview:

This chapter is designed to help the participants get a sound understanding of the Large Value Payment Systems. Specifically, you will learn about the various Large Value Payment systems Fedwire, etc. We will get to know about the role of clearing houses in the LVPS. We will have a fair knowledge about the CHIPS and how it works. TARGET2 will be another LVPS we will get to know about.

4.1 Clearing Houses for Large Value Payment Systems

In the United States, payment and securities settlement systems consist of numerous financial intermediaries, financial services firms, and non-bank businesses that create, distribute, and process large-value payments. The bulk of the dollar value of these payments are processed electronically and are generally used to purchase, sell, or finance securities transactions; disburse or repay loans; settle real estate transactions; and make large-value, time-critical payments, such as payments for the settlement of interbank purchases and sales of federal funds, settlement of foreign exchange transactions, or other financial market transactions.

There are two primary networks for interbank, or large-value, domestic, funds transfer payment orders. The first, Fedwire® Funds Service, is operated by the Federal Reserve Banks, and is an important participant in providing interbank payment services as well as safekeeping and transfer services for U.S. government and agency securities, and mortgage-backed securities. In addition, Fedwire3 Funds Service and the Federal Reserve's National Settlement Service (NSS) are critical components used in other payment systems' settlement processes. The Clearing House Interbank Payments Company L.L.C. (CHIP Co.) operates the second, the Clearing House Interbank Payments System (CHIPS).

Processing large-value funds transfers involves two key elements: clearing and settlement. Clearing is the transfer and confirmation of information between the payer (sending financial institution) and payee (receiving financial institution). Settlement is the actual transfer of funds between the payer's financial institution and the payee's financial institution. Settlement discharges the obligation of the payer financial institution to the payee financial institution with respect to the payment order. Final settlement is irrevocable and unconditional. The finality of the payment is determined by that system's rules and applicable law.

In general, payment messages may be credit transfers or debit transfers. Most large-value funds transfer systems are credit transfer systems in which both payment messages and funds move from the payer financial institution to the payee financial institution. An institution initiates a funds transfer by transmitting a payment order (a message that requests the transfer of funds to the payee). Payment order processing follows the predefined rules and operating procedures of the large-value payment system used. Typically, large-value payment system operating procedures include identification, reconciliation, and confirmation procedures necessary to process the payment orders. In some systems, financial institutions may contract with one or more third parties to help perform clearing and settlement activities on behalf of the institution.

The legal framework governing payment activity and the regulatory structure for financial institutions that provide payment services is complex. There are rules for large-value payments that are distinct from retail payments. Large-value funds transfer systems differ from retail electronic funds transfer (EFT) systems, which generally handle a large volume of low value payments including automated clearinghouse (ACH) and debit and credit card transactions at the point of sale.

4.2 Fedwire Funds Service

Fedwire Funds Service is a real-time gross settlement system (RTGS) enabling participants to transmit and receive payment orders between each other and on behalf of their customers. Real-time gross settlement means that the clearing and settlement of each transaction occurs continuously during the processing day.

Payment to the receiving participant (payee) over Fedwire Funds Service is final and irrevocable when the Federal Reserve Bank either credits the amount of the payment order to the receiving participant's Federal Reserve Bank reserve account or sends notice to the receiving participant, whichever is earlier.

Fedwire Funds Service participants must maintain an account with a Federal Reserve Bank. Because of this requirement, non-financial organizations are not permitted direct access to Fedwire Funds Service, although these entities may use these services indirectly as customers of deposit-taking financial institutions.

Certain payment and securities settlement systems, such as CHIPS and CLS, also rely upon Fedwire Funds Service to allow participants or their correspondents to provide necessary funding.

Financial institutions sending a Fedwire Funds Service payment order irrevocably authorize their Federal Reserve Bank to debit (charge) their Federal Reserve account for the transfer amount and to give credit in the same amount to the payee. Only the originating financial institution can have funds removed from its Federal Reserve account using the Fedwire Funds Service. Depository institutions that maintain a reserve or clearing account with a Federal Reserve Bank may use Fedwire Funds Service to send payments to, or receive payments from, other account holders directly. Once the Federal Reserve Bank credits the receiving institution's account, it will not reverse the transaction at the request of the originating institution.

Financial institutions may access the Fedwire Funds Service via high-speed direct computer interface (CI), FedLine, or with off-line telephone connectivity with a Federal Reserve Bank. Financial institutions may also access certain Fedwire Funds Service inquiry information via FedLine for the Web. On-line participants, using either a CI or FedLine PC connection to Fedwire Funds Service; require no manual processing by the Federal Reserve Banks. Off-line participants provide funds transfer instructions to one of two Federal Reserve Bank customer support sites by telephone, and after authenticating the participant, the Federal Reserve Bank enters the transfer instruction into the Fedwire Funds Service system for execution. The manual processing required for off-line requests makes them more costly and suitable only for institutions processing a small number of funds transfer payment orders.

The Federal Reserve Bank's FedLine for the Web currently offers access to low-risk Federal Reserve Bank financial services. FedLine Advantage, which should begin a graduated rollout by year-end 2004, will allow depository institutions access to additional Federal Reserve financial services, including the Fedwire Funds Services and the Fedwire Securities Service, via a secure Internet Protocol (IP) gateway to Federal Reserve Bank financial services. Residing on a secure Web server, FedLine Advantage will be accessible to customer financial institutions with authenticated credentials using digital certificates.

- Large and small payment transactions
 - U.S. dollar foreign exchange settlements
 - Financial settlements (ex. Loan and interest payments)
 - Commercial payments
 - Off shore investments.

4.2.1 CHIPS Statistics:

- Transfers an average total value of \$1.4 trillion a day, with only \$2.8 billion in pre funding, that's 500 USD transfers for each USD in pre funding
- Clears over 270,000 transactions on an average day
- Handles 95% of all U.S. dollar cross-border payments
- In a working day of 9 am to 5 pm for Intra Day & 5 to 5:30 pm for EOD procedures, 85% of the daily transfers are over by 12 noon
- No carryover of messages or positions to the next day

4.2.2 Time Lines:

- A CHIP is available from 9:00 a.m. until 5:00 p.m.
- CHIPS regular cutoff occurs daily at 5:00 p.m. (ET). Approximately thirty minutes before cutoff each participant is notified of the scheduled cutoff time. At cutoff, CHIPS transmits to participants the net amounts due to them, or due from them, for the day.

4.2.3 Settlement Type:

- CHIPS is a real-time final settlement system (RTFS) with a risk profile similar to that of real-time gross settlement (RTGS) system
- Net Basis at frequent intervals

4.2.4 CHIPS - Connectivity:

- V-Term - Stands for Virtual Terminal
- V-Term - Virtual circuit number assigned by CHIPS.
- A communication line to CHIPS is assigned virtual circuit numbers on which the clearing participants send and receive messages, much like the L-terms on the FRB line.

4.2.5 Chips Identification Codes

- **UID** - Universal Identifier: A database of identification numbers that verifies and matches customers to their bank account information
 - Unique six digit identifier on the CHIPS database for an institution that holds an account with one or more CHIPS participants
 - Each Customer is assigned a identifier - Universal Identifier
- **PN** - Participant Number
 - Unique four digit number assigned to an institution that sends and receives payments through the CHIPS clearing house (i.e., is a clearing house member).
 - Maximum amount that can be processed is One Cent less than 10 billion dollars (\$9,999,999,999.99)
 - Messages input to CHIPS should not exceed 12,200 characters.

4.2.6 CHIPS - Key words:

- **PSN** - Payment Sequence Number - 7 Digit Numeric number to be assigned by the sender. Each payment from a sender is uniquely identified by the number.
- **ISN** - Input Sequence Number (Issued by CHIPS) (6-Digit), Assigned by CHIPS on receipt of the message from a sender.
- **OSN** - Output Sequence Number (Issued by CHIPS) (6-Digit)
- **RSN** - Resolved Sequence Number (issued by CHIPS) (6-Digit)
- **SSN** - System Sequence Number (7-Digit), Assigned by CHIPS on receipt of the message from a sender.

4.2.7 CHIPS Operation Environment

Participant, with CHIPS approval, becomes a party to the CHIPS Pre Funded Balance Account at FRBNY

- FRBNY holds all funds in the Chips Pre Funded Balance Account for joint benefit of all participants
- During the day, payment messages released by CHIPS are recorded in its systems books, not FRBNY
- FRBNY neither takes any action during the day to reflect the payment messages released by CHIPS
- Nor does any participant have a separate individual claim against FRBNY for any balance.

4.2.8 How CHIPS Works:

Settlement is tiered, with 20 settling participants, 10 members of the New York Clearing House and 10 non-members. The settling participants settle both for themselves and for non-settling participants. Each non-settling participant must designate a settling participant to settle for it. Settlement is completed when all settling participants owing funds have made payments to the special account and funds have been transferred from the special account to CHIPS-settling participants due funds.

- For example, suppose a London bank wants to transfer \$1 million from its account at one New York correspondent bank "A," to an account at second New York correspondent bank "B." Banks "A" and "B" are both CHIPS participants.

- The London bank sends bank "A" a payment instruction by telex or through the SWIFT system. Bank "A" verifies the London bank's message and prepares to enter it into CHIPS, providing the identifying codes for the sending and receiving banks, the identity of the account at bank "B" which will receive the funds, the amount of the transaction and any other pertinent payment information.
- Bank "A" then releases the message. The CHIPS computer verifies that the transaction is within "A's" net debit cap and does not exceed "B's" bilateral limit for "A" and, if within these limits, transmits the message to "B". If either limit is exceeded, the message is rejected. Upon transmission, the CHIPS computer also makes a permanent record of the transaction and makes appropriate debits and credits for the CHIPS records.
- When bank "B" receives a CHIPS credit message for one of its respondents, bank "B" notifies the bank that the funds are being credited to its account.
- Immediately following the closing of the CHIPS network at 4:30 p.m. (Eastern time), the CHIPS computer produces a settlement report showing the net debit or credit position of each participant.
- A separate settlement report shows the net position of each settling participant. The net position of non-settling participant is netted into the position of its correspondent settling participant.
- The settling banks have one hour to determine whether they will settle the net position of those participants for which they settle. If none refuse to settle, the settling participants with net debit positions have until 5:30 p.m. (Eastern time) to transfer their debit amounts through Fedwire to the CHIPS settlement account on the books of the New York Fed.
- When this procedure has been completed, the Clearing House transfers those funds via Fedwire out of the settlement account to settling participants with net credit positions. The process usually is completed by 5:45 p.m. (Eastern time). Like all Fedwire transfers of funds, transfers into and out of the CHIPS settlement account are final and irrevocable upon receipt.

4.3 TARGET 2

TARGET (Trans-European Automated Real-time Gross settlement Express Transfer) is the Euro system's interbank funds transfer system, which is designed to support the Euro system's objectives of defining and implementing the monetary policy of the euro area and promoting the smooth operation of payment systems, thus contributing to the integration and stability of the euro area money market. While the first TARGET system was made up of RTGS (real-time gross settlement) systems in all participating countries and the ECB payment mechanism (EPM), connected by an interlinking component, TARGET2 is a single centralized system, offering the same level of service to all TARGET2 users. It has been designed and built to meet the highest standards of robustness and operational reliability.

The system has been designed in such a way that it is able to **process cross-border payments** denominated in **euro** as smoothly as if they were domestic payments. TARGET2 processes only transfers denominated in **euro**. The aim is to allow payments - especially **large-value payments** such as those relating to **foreign exchange** and **money market transactions** - to be made throughout the euro area at low cost with high security and very short processing times.

As it is a RTGS system, payments are handled individually. Unconditional payment orders are automatically processed one at a time on a continuous basis.

Thus, TARGET2 provides immediate and final settlement of all payments, provided that there are sufficient funds or overdraft facilities available on the payer's account with its central bank. There is no set minimum amount for a payment made through TARGET2.

4.3.1 TARGET2 structure

A. Governance structure

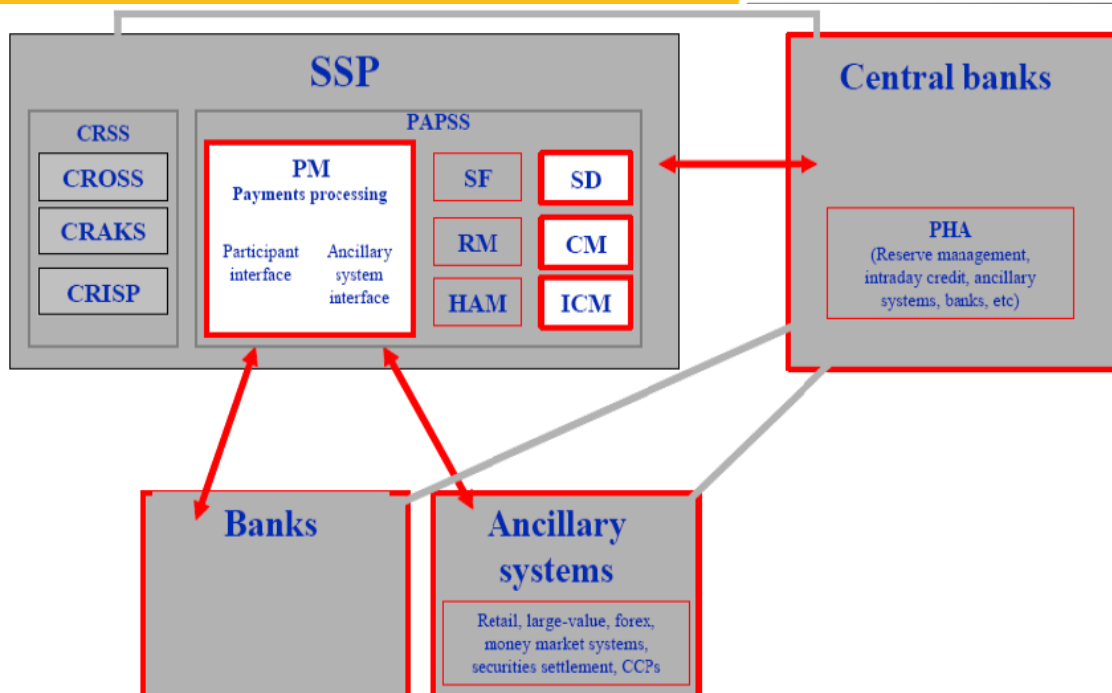
The management of TARGET2 is based on a three-level governance scheme. The tasks are assigned to the Governing Council (Level 1), the Euro system central banks (Level 2) and the SSP-providing central banks (Level 3).

Level 1 – Governing Council	Level 2 – Eurosystem central banks	Level 3 – SSP-providing central banks
Operation		
– Managing severe crisis situations	– Management with regard to system-owner responsibilities – Maintaining contacts with users at European level (subject to the sole responsibility of central banks for the business relationship with their TARGET2 users) and monitoring daily user activity from a business perspective (central bank task) – Monitoring business developments – Budgeting, financing, invoicing (central bank task) and other administrative tasks	– Managing the system on the basis of the agreement referred to in the Guideline on TARGET2

B. Technical structure

From a technical point of view, TARGET2 is structured as described below:

- The single shared platform (SSP) with the payment and accounting processing services systems (PAPSS) and the customer-related services systems (CRSS);
- the PAPSS with the payments module (PM), the standing facilities module (SF), the reserve management module (RM), the home accounting module (HAM), the static data module (SD), the contingency module (CM) and the information and control module (ICM);
- The customer-related services systems for central banks only (CROSS, CRAKS and CRISP);
- The central banks with a proprietary home account (PHA), reserve management and intraday credit;
- The banks are connected via SWIFT;
- The ancillary systems are connected via SWIFT.



4.3.2 Organizational structure at central bank level

The sole contact point for TARGET2 users is the national service desk at their respective national central bank. Within the Euro system, the national service desk is represented by the settlement manager. All settlement managers are interlinked by means of a standing teleconference facility. Each NCB also has a crisis manager who is informed via the respective settlement manager and is involved in the case of problem escalation. The crisis managers are also interlinked via a standing teleconference facility.

4.3.3 Types of payment

TARGET2 offers its participants settlement services in euro, with settlement in central bank money. Every euro payment that is to be settled in real time and in central bank money can be settled via TARGET2. Direct TARGET2 participants can submit the following payment and SWIFT message types.

- Credit transfers (MT 103, MT 103+, MT 202)
- Direct debits (MT 204)

As a general rule, payments are executed immediately if there is sufficient liquidity on the RTGS account of the participant. In order to have payments settled according to priority, the participant can assign the following priorities.

- Priority level 0 = highly urgent payments
- Priority level 1 = urgent payments
- Priority level 2 = normal payments

Each priority level has special characteristics. Some priority levels can only be used by certain participant groups.

A. Customer payments

Customer payments are defined as credit payments in the SWIFT MT103 and SWIFT MT103+ formats (standard and STP). Customer payments can be processed in TARGET2 from 07:00 until 17:00.

B. Interbank payments

Interbank payments are defined as credit payments in the SWIFT MT202 format and in MT202COV format, and direct debit payments in the SWIFT MT204 format. These messages are sent by or on behalf of the ordering institution either directly or through any correspondent(s) to the financial institution of the beneficiary institution. Interbank credit payments MT202 are payments, such as the payment leg of money market, foreign exchange and derivatives transactions, which take place between credit institutions or between NCBs/the ECB and credit institutions.

MT202COV are interbank payments that “cover” underlying customer payments and contain fields for the originator and beneficiary of the credit transaction.

Direct debits MT204 in TARGET2 are intended for wholesale purposes only and are restricted to interbank transactions. In any case, the respective TARGET2 users have to agree with the parties allowing the debiting of their accounts on the terms and conditions for using this service. The TARGET2 user authorizes another TARGET2 user to issue a direct debit order. The TARGET2 user also has to inform its central bank, which is responsible for recording and administrating the pre agreements. Interbank payments can be processed in TARGET2 from 07:00 until 18:00.

4.3.4 Payment settlement

In TARGET2, each individual payment submitted is processed entirely in real time. This means that the individual payment is taken into account in each stage of processing. This includes the possibility of checking the status of the payments in the Information and Control System and changing important control parameters of individual payments (eg their position in the queue).

In TARGET2, all incoming payments are settled on a gross basis, which means the following.

- Cover principle
- Settlement in central bank money
- Immediate booking

Settled payments are booked immediately on the RTGS account and are then irrevocable. Payments that have not been settled remain in the queue until no longer than the end of the business day.

Depending on the payment type, the participant's payments in the queue are settled in a liquidity-saving way using high-performance settlement algorithms.

The following rules apply.

- In the case of highly urgent and urgent payments, an event-oriented check is performed as to how they can be settled. This check occurs in the following cases.
 - Each new inflow of liquidity
 - Change to the sequence of highly urgent and urgent payments
 - Recall of a highly urgent or urgent payment
 - Change of payment type
- In the case of normal payments, there is a continuous settlement process. This involves all highly urgent, urgent and normal payments in the queue under consideration of the set limits and the reserved liquidity.

TARGET2 supports the settlement of time-critical settlement payments that the participant has to make to other clearing procedures (e.g. CLS, EURO1). The following functions are available in this case.

- Reserving liquidity
- Prioritizing payments
- Setting execution time

4.3.5 Payment flow

The customer interface between TARGET2 and its direct participants is based on SWIFT. The SWIFT FIN Y copy service and a dedicated SWIFT closed user group are used for the payment flow via TARGET2. The use of the Y copy service allows participants to address their payments as they would in correspondent banking. The addressing of TARGET2 payments is supported by a TARGET2 directory (directory of all banks that can be addressed via TARGET2).

4.4 Key Learnings

- Role of Clearing Houses in LVPS
- Fedwire Fund service - Fedwire Funds Service is a real-time gross settlement system (RTGS) enabling participants to transmit and receive payment orders between each other and on behalf of their customers.
- CHIPS
 - A CHIP is available from 9:00 a.m. until 5:00 p.m.
 - CHIPS is a real-time final settlement system (RTFS)
 - Settlement is tiered, with 20 settling participants, 10 members of the New York Clearing House and 10 non-members. The settling participants settle both for themselves and for non-settling participants.
- TARGET2
 - TARGET (Trans-European Automated Real-time Gross settlement Express Transfer) is the Euro system's interbank funds transfer system, which is designed to support the Euro system's objectives of defining and implementing the monetary policy of the euro area
 - The single shared platform (SSP) with the payment and accounting processing services systems (PAPSS) and the customer-related services systems (CRSS)
 - Credit and Debits and payment settlement with TARGET2.

4.5 Test your Understanding

1. Fedwire Routing Numbers are _____.
 - a. Same for a bank
 - b. Different for every state in which the bank operates
2. CHIPS operates round the clock as a Gross payment system.
 - a. TRUE
 - b. FALSE
3. Fedwire transfers are _____.
 - a. Payer initiated
 - b. Batch processed
 - c. Real-time processed
 - d. Electronic
 - e. All of the given options
 - f. A- c- and d
4. All economies of the world have a Day Light Credit arrangement which is identical in its construct.
 - a. TRUE
 - b. FALSE
5. The real-time gross settlement funds transfer system operated by the United States is known as _____.
 - a. Clearing House Interbank Payments System or CHIPS
 - b. Clearing House Automated Payment System or CHAPS
 - c. Fedwire

5 Cross Border Payments

Chapter Overview:

This chapter will deal with cross border payment systems which will cover the general principles, need for CLS and the importance in today's world. We will also get to know about the Nostro & Vostro accounts. CLS will be dealt with in fair detail.

5.1.1 Cross border payments - General Principles

Cross border payments have to be considered separately from domestic payments for the following reasons:

- Currency of one country never actually crosses the borders as a means of settling dues to a person in another country. The notes we encounter at money changers at airports and other locations are for travel purposes and to put it in context, constitute a very small/ miniscule percentage of all money paid.
- The resident of a country needs his own country's currency to make local payments for items of consumption like purchases, rent, utility bills, salaries and wages and so on. Foreign currency, even if more valuable and treated as an appreciating asset is of no use in meeting obligations in those situations described above.
- To reach money to a Recipient you have to reach money to the Recipient's Bank.
- If the Recipient's Bank is in another geography, either the paying bank should be present in that geography; or the Recipient Bank should have a branch in the Payer's geography.

The required account of the Recipient Bank in the Payer's country is the Recipient's Nostro Bank Account. Alternatively the required account of the Payer Bank in the Recipient's country is the Payer's Nostro there.

Finally, to take a basic principle from payments in general, If a payer reaches money to a Recipient's Bank, whether by crediting Recipient's Nostro in paying country or by debiting Payer's Nostro in recipient's country then and only then can a payment be effected. Paying a Recipient also means paying the Recipient's Banker.

5.1.2 Nostro and Vostro Accounts

All internationally active banks maintain accounts in those currencies in which they have large volumes of dealings. The account of a bank in a foreign currency maintained in that foreign currency centre is termed as a Nostro Account. Nostro literally means "our account with them". It therefore implies one bank's foreign currency account with a particular bank in that other location.

However, this literal meaning is neither valid anymore nor is it useful in promoting our understanding.

For instance, the foreign currency account might be in "my own" bank's branch in London, UK. It would still be a Nostro even there is no "them" involved in the literal sense. It is best understood as a foreign currency account in the commercial center for that currency/country.

For US Dollars the Nostro account would be a dollar denominated bank account in New York, USA. For Pounds Sterling Nostros are in London, UK. For the Euro in either Frankfurt or Paris, possibly Amsterdam. For the Australian Dollar in Sydney. For the Indian Rupee in Mumbai, India and so on.

The concept of Vostro literally means "their account with us". This necessarily implies that the paying bank maintains an account in the local currency with our bank. The Paying Bank may ask for payments to be made out of this account "with us". However, operationally, equally the Paying Bank may ask for payments to be made out of a Nostro Bank account they maintain in the Recipient Bank's country. So Vostro needs to be interpreted narrowly in the context of the account necessarily being 'with us'.

Nostro is a broader concept and is more useful in promoting our understanding of cross border payments in general terms. Every bank which deals in a particular currency will have a dedicated Nostro account for that currency. Given a number of currencies in which a bank may deal it has to have a Nostro account for each currency.

Thus, a bank will have a string of Nostro accounts and typically the following currency Nostros are almost always maintained by every bank: US Dollar Nostro, Euro Nostro, Pound Sterling Nostro, Australian Dollar Nostro and Japanese Yen Nostro. As China increases its role in international trade and starts to conduct its trade in Yuan, banks will also need a Chinese Yuan Nostro.

An example: assume that John in London wishes to make a payment to Joe in New York.

Firstly, John in London has GBP but Joe in New York should receive USD.

Either John's bank in London should have a USD Nostro account. In this case John's UK account will be debited and from the Nostro account in NY, USD will be transferred to Joe's account.

Alternatively, Joe's bank in New York should have a Vostro account with John's bank. John's bank can then credit the Vostro with GBP by debiting John's account. Joe's bank will then transfer the corresponding dollars to Joe's account.

In this example, it is sufficient if either John's bank has a Nostro in NY. Or if Joe's bank has a Vostro with John's bank in London.

5.1.3 Correspondent Banking

All banks are not present everywhere.

Yet, to receive money from another country either the Recipient Bank needs to be present in that other country (via Nostros/ Vostros). Alternatively, the Payer Bank needs to be present in the Recipient Country.

And yet, all banks are not present everywhere.

The solution is in Correspondent Banking, whereby a bank which needs to be present in a location but is not present there, has a tie up with another bank which is indeed present in that location. This tie up is known as Correspondent Banking and the bank offering access is called the Correspondent Bank. Correspondent Banks earn fees and volumes for services rendered. The customer bank gains access to the banking system of the Correspondent Bank's country.

It should be noted that Correspondent Banking exists in domestic situations as well. If a bank is not a member of a particular clearing system but has a need to offer benefits of that clearing system to its customers, it will enter into a Correspondent Banking relationship.

In this situation one of the benefits to the customer bank is that it does not have to fulfill membership obligations of that clearing house. Such obligations include fees and volume commitments. Fees may not be affordable if the customer bank is small. Volumes may not be achievable at all. Correspondent Banking helps in these situations.

5.1.4 Risk Management in Correspondent Banking Relationships

Correspondent banking is globally recognized as an inherently high risk business

- Provides access to the global financial system
- Cross border/high volume/third party transactions
- Products offered support high speed movement of funds
- Differing regulatory regimes, levels of enforcement and multi-lateral agency cooperation
- By nature, correspondent banks have a symbiotic relationship requiring some reliance on their client bank's programs

Money launderers exploit vulnerabilities to successfully legitimize illicit funds. Vulnerabilities in correspondent banking come in many forms. Identifying these vulnerabilities or risks is critical if a financial institution is to mitigate and manage them. Banks have many considerations when deciding to establish correspondent banking relationships, including credit and operational risk. The risks associated with money laundering or terrorism financing (ML/TF risk) should be an integral part of this process and the main risks are outlined here.

5.1.5 Inadequate Due Diligence Risk

The degree of due diligence exercised by some banks appears to be determined by whether credit is being granted in the correspondent relationship, with more due diligence carried out where credit is being granted. The failure of banks to include measures to detect money laundering or terrorism financing when undertaking due diligence on correspondent accounts exposes them to ML/TF risk. Banks are exposed to greater risk on correspondent accounts if:

- the correspondent bank provides services to banks that are not physically present in any country(shell banks)
- a correspondent bank establishes a relationship with a respondent bank that permits the opening of accounts for carrying out transactions with shell banks
- the respondent bank has a relationship with a third-party bank (nested accounts)
- the country of the respondent bank has not implemented AML/CTF regulations
- the correspondent bank has not reviewed the respondent bank's existing AML/CTF practices before establishing the relationship
- the respondent bank does not apply KYC controls to identify existing and non-established customers
- the respondent bank has a reputation of a poor financial position
- the respondent bank has been subject to regulatory action
- the respondent bank does not conduct regular audits
- the respondent bank does not employ a monitoring system designed to identify and report suspicious activity/transactions
- the respondent bank does not screen new account activity against lists of known or suspected terrorists.

5.2 Payments

Payments or funds transfer systems such as SWIFT may represent a heightened degree of risk, depending on factors such as:

- the number and dollar volume of transactions
- whether cash is involved
- the geographic location of originators and beneficiaries
- whether the originator or beneficiary is a bank customer
- whether the customer has been identified
- Whether the source of the funds has been established.

5.2.1 Payable through accounts

Banks should be particularly alert to the risk that correspondent accounts might be used directly by third parties to transact business on their own behalf; for example, by using payable through accounts.

Payable through accounts typically involve a foreign bank providing its local customers with a full range of banking services (including deposits, withdrawals and cheque accounts) at the local bank through the foreign bank's correspondent account. Payable through accounts are also known as 'pass through accounts' or 'pass by accounts' and such customers are referred to as 'sub-account holders'.

Payable through account activities should not be confused with traditional correspondent banking relationships, whereby a foreign bank's customers can transact through a domestic bank but they do not have direct access to the correspondent account at the domestic bank. A payable through account arrangement actually provides sub-account holders with direct access to the domestic bank to independently transact.

5.2.2 Examples of Possible Suspicious Correspondent Account Activity

In some circumstances, the following activities, none of which per se constitutes Suspicious Correspondent Account activity, may be indicative of Correspondent Account activity that may require further investigation and a closer review:

- Wire transfers in large dollar amounts, where the Correspondent Account has not previously been used for similar transfers;
- Unusually large numbers of wire transfers;
- Transactions conducted in bursts of activity within a short period of time;
- Unexplained repetitive or unusual patterns of wire transfer activity;
- Unusual volume of the Respondent Bank's own bank check or dollar draft activity.
- Unusually high numbers of returned or rejected items;
- A request by a Respondent Bank to establish a relationship with, or route a transaction through, a financial institution that is not accustomed to doing business with Foreign Banks and that has not sought out business of that type;
- The routing of transactions involving a Respondent Bank through several jurisdictions and/or financial institutions prior to or following entry into the Bank without any apparent purpose other than to disguise the nature, source, ownership or control of the funds;
- Frequent or numerous wire transfers originating from or for the benefit of Shell Banks or High Risk Respondent Banks;
- Frequent or numerous wire transfers either to or from the Correspondent Account of a Respondent Bank originating from or going to a Non-Cooperative Jurisdiction;
- Beneficiaries maintaining accounts at Foreign Banks that have been the subject of previous suspicious activity reporting due to suspicious wire or other wholesale product activity.
- Reappearing beneficiary banks based in offshore locations, the account of at least one of which has been closed by the Bank due to overall suspect activity.
- Large currency or bearer instrument transactions either into or out of the Correspondent Account of a Respondent Bank;
- The deposit or withdrawal from a Respondent Bank's Correspondent Account of multiple monetary instruments (e.g. traveler's checks, money order, bank drafts) just below the reporting threshold on or around the same day, particularly if the instruments are sequentially numbered;
- Issuance of large volumes of cashier's checks or bank drafts against the Respondent
- Bank's Correspondent Account, particularly when the face amounts are less than local reporting requirements.

- High-value deposits or withdrawals, particularly irregular deposits or withdrawals, not commensurate with the type of Correspondent Account or business of the Respondent Bank;
- Wire transfers to accounts of individuals identified by law enforcement agencies as being suspected of engaging in money laundering or terrorist activities; and
- An inquiry by or on behalf of a Respondent Bank regarding exceptions to the reporting requirements of the Bank Secrecy Act (for example, currency transaction reports and suspicious activity reports) or other rules requiring the reporting of suspicious transactions.

5.2.3 Information Requirements for Payments

Electronic payment systems and all cross-border payment systems are Payer initiated. The payer must ask his bank to make the payment to the recipient. To do so, the Payer needs to provide significant and specific information covering the Recipient and the Recipient's Bank.

It is logical that the Payer can get this data only from the Recipient. If the Recipient leaves any gaps in information there is no way for the Payer to know.

Perfect transaction processing (Right First Time as a process objective) requires that the Payer Bank makes it absolutely clear to the Payer as to what all information is needed from the Recipient.

The matter is further complicated by the fact that the Recipient needs to furnish information from Recipient Bank which is one more 'data transfer layer'. The information requirements are as follows:

Recipient Data:

- Recipient Name
- Bank account number
- Recipient Bank name

Recipient Bank Data:

- Recipient Bank's Nostro Account Number
- Address of Recipient Bank at Nostro location
- Fedwire number/RTGS details/ABA number (country equivalent) of Recipient Bank
- Recipient's SWIFT Address

Where a Correspondent Bank is involved the same information as listed for Recipient Bank needs to be provided for the Correspondent.

Where a payment is routed through a series of such arrangements then information for every bank in the link needs to be provided. Since this data is needed at initiation of payment the route the money is going to take needs to be previously ascertained; and all related information needs to be provided upfront.

We can now examine different payment systems always keeping in mind that the Payer aims to hit (credit) the Nostro of the Recipient Bank so that onward credit may be passed to the Recipient.

5.3 Continuous Linked Settlement

Continuous Linked Settlement (“CLS”), which went live on 9th September 2002, is a key development in the banking industry in recent years.

Continuous linked settlement (CLS) is the only global payment system that operates on payment versus payment (PvP) basis for cross-border settlements in 18 currencies.



The “continuous” means that the settlement runs continuously in the specified time-window until all the currency time zones are covered; and the “linked” means that the payment made for sold currency is linked to the payment to be received for bought currency.

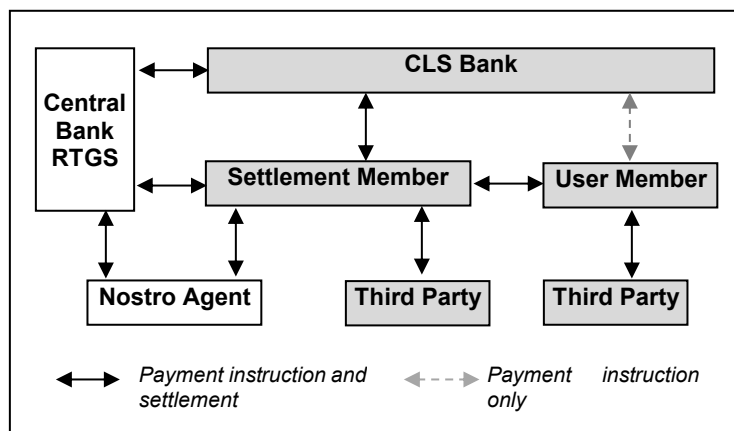
Either both of them are settled or none of them is settled. Continuous linked settlement is different from trade guarantee. In the latter, the settlement is guaranteed; in the former, the principal amount is guaranteed, but not the settlement. If the settlement fails, the non-defaulting party will not lose the principal but has to replace the trade at the prevailing market price, which is subject to the loss of replacement cost.

Currently, six instruments are settled in each CLS currency: FX spot, FX forward, FX swap, FX option premium and exercise, non-deliverable forward (NDF) and credit derivatives. The first three involve settlement in two currencies on PvP basis. The last three involve payment in a single currency, which does not require PvP requirement, but CLSB provides value-added services (e.g. automated confirmation/exercise notice) in the instruments. In each of the CLS currencies, CLSB makes and receives payment with its members in the RTGS system through its accounts with central banks. CLSB has two types of members: settlement member and user member.

- **Settlement Members:** They maintain a single multi-currency account with CLSB and assume responsibility for settlement risk and providing liquidity. For this reason, only large financial institutions can be settlement members, and CLSB has prescribed certain qualifying criteria.
- **User Members:** They maintain a single multi-currency account with a settlement member, but can submit settlement instructions directly to CLSB, which are settled by the settlement member with CLSB. User member does not assume responsibility for settlement risk or liquidity support.

Members access the CLSB systems through SWIFTNet InterAct, which is an automated and interactive messaging system of SWIFT. There are two more parties in the CLS operations: third parties and Nostro agent. Third parties are users of the CLS, but not its members. They settle transactions through either user members or settlement members.

Nostro agents are neither users nor members of the CLS: they are facilitators. Since CLSB makes and receives payments only through RTGS systems, settlement members, too, must have access to them. If they do not have direct access to RTGS systems, then a Nostro agent will establish the connectivity between the CLSB and settlement members. In general, most settlement members have direct access to the RTGS system. The following exhibit shows the relations between various parties.



5.3.1 Submission of Settlement Instructions

Settlement instructions are submitted by settlement members and user members to CLSS via SWIFTNet. They can be submitted as soon as the trade is executed and up to 06:30 CET on value date. However, the best practice is not to submit the instruction after 00:00 CET on value date. In other words, cash value date trades are settled outside the CLS system.

5.3.2 Matching

After comparing the settlement instructions from both the parties, CLSS will assign the following trade status, which is made available to the members in real time

Status	Description
REJECTED	Possible duplication
INVALID	Not a CLS currency or a business day
SUSPENDED	Trade does not pass risk management tests
UNMATCHED	Settlement instruction not received from counterparty
MATCHED	Eligible for settlement

Matched instructions can be cancelled or modified up to 00:30 CET on value date unilaterally and up to 06:30 CET on value date bilaterally.

5.3.3 Settlement and Funding

CLSS makes a distinction between settlement and funding. Settlement refers to the book entries in the settlement member's account with CLSB and is on *gross* basis. Funding is the pay-in in central bank RTGS funds and is on *net* basis. The following example illustrates the settlement and funding for three transactions in EUR/USD as follows. (Sale = Debit; Purchase = Credit).

Settlement (in the settlement member's account with CLSB)

	EUR		USD	
	Debit	Credit	Debit	Credit
	100			125
		200	245	
	150			185
Total	250	200	245	310

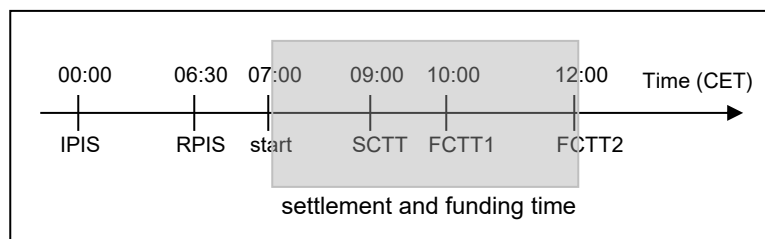
Settlement member pays EUR 250 and receives EUR 200; and pays USD 245 and receives USD 310. It is on *gross* basis. Funding (between CLSB and settlement member in RTGS funds)

EUR		USD	
Debit	Credit	Debit	Credit
50			65

Settlement member pays EUR 50 and receives USD 65. It is on *net* basis.

The multi-lateral netting before pay-in results in, on an average, the reduction of 95% in funding and 99.75% in the number of transactions, which improves liquidity management and lowers transaction costs. The following is the timeline for various activities, which are summarized in exhibit below.

- 00:00 CET: Initial pay-in schedule (IPIS) after multilateral netting is issued; this is also the deadline for unilateral cancellation or amendment.
- 06:30 CET: Revised pay-in schedule (RPIS); this is also the deadline for bilateral cancellation or amendment.
- 07:00–12:00 CET: This is the five-hour settlement cycle time window, during which settlement will be completed in the first two hours while the funding takes place continuously.
- 09:00 CET: Settlement completion target time (SCTT)
- 10:00 CET: Funding completion target time for Asia-Pacific currencies (FCTT1)
- 12:00 CET: Funding completion target time for other currencies (FCTT2)



5.3.4 Processing Queue

Before the pay-in schedule is issued, settlement instructions are filtered based on certain risk management criteria (discussed in the next section). Since the funding takes place continuously, a large payment amount in the early stages may block all other payments and result in a total pay-in failure. To prevent such a situation, large amounts are split into smaller amounts to facilitate early pay-ins. After the pay-in occurs in the RTGS funds, CLSB completes the corresponding pay-out to the settlement member or its Nostro agent. The unsettled trades at 12:00 CET are removed from the queue, and the counterparties will decide whether to settle them in CLS on the next day or settle it outside CLS on the same day.

5.3.5 Trailblazing trends in global payments

Diverse trends are driving deep structural changes across the global payments industry. On the retail side, consumers' use of mobile devices to shop both online and in-store is pushing merchants to adopt increasingly complex and powerful technology. On the corporate side, a new generation of solutions raises hopes among corporate treasurers of improved transparency and predictability of payments and the steady reduction of costly obstacles, especially in cross border payments, where liquidity is trapped in document-heavy processes.

To put these trends in perspective, 16 predictions and observations distilled from the payments arena around the globe. Each topic will help shape the payments arena and should figure in the strategic thinking of banks, card companies, processors and technology providers as they determine the best path and the right partners. Depending on size, client base and market position, their strategy will aim to defend core business, mount a charge of creative destruction, or strike a balance between the two.

- **As shopping moves in-app, digital payments displace cash**

Multichannel shopping puts the consumer front and center, and creates new sources of value for merchants. Mobile devices have become the “digital container” of our daily lives—communications, planning, shopping, health, transportation—making “in-app” the new battleground for both online and instore shopping. The persistent strengths of cash—convenience (cash is versatile and widely accepted), control (cash is final and Spend is limited to cash in wallet) and value (it's free, at least in appearance)—vanish in a digitizing world:

- Convenience: Stored preferences and account information enable both the automation and personalization of payments, which can be initiated anytime, anywhere, with virtually no geographic boundaries.
- Control: Smart tools to control expenditures, increase savings and improve budgeting afford much broader control and stronger financial management than cash.
- Value: Repetitive interaction enables merchants (usually in cooperation with their payments and data analytics partners) to extend offers and services tailored to a consumer's location and needs.

- **Multichannel solutions win as channels converge**

As consumers increasingly use their phones, tablets and computers to shop anytime, anywhere, merchants need to keep track of individual consumers across channels—

Online, mobile, proximity—to ensure a consistent consumer experience. In order to stay in touch with the consumer at each step of the search-evaluate-buy-bond cycle, most merchants will forge partnerships and alliances with data analytics specialists and digital innovators.

To keep up with merchant requirements, payments companies must, therefore, be prepared to deliver integrated, multichannel solutions that combine, for example, preauthorization, split payments and customer analytics across channels.

This will require expanded capabilities and strategic partnerships. Digital wallets have a key role to play in multichannel convergence, and in order to stand out from the competition, some wallets will incorporate multiple loyalty programs in order to determine the best deal by weighing card offers (e.g., extended warranties, special financing), store coupons and loyalty points, among others. While users value a unified, ubiquitous experience, data ownership and privacy have become major strategic considerations for consumers and merchants alike, as illustrated by Apple Pay's insistence on not collecting payments data.

- **Migration to EMV ignites mobile payments**

The migration to EMV standards across multiple regions outside Europe requires most parties to invest in chip technology. While issuers and acquirers bear the largest part of migration costs (converting all cards and acceptance technology from magnetic strip to EMV chip), merchants who fail to install chip readers assume huge financial risks in the form of liability for fraudulent transactions.

Some merchants are still oblivious to the new standards; however, many others are using the conversion as an opportunity to implement mobile payments solutions, including wallets, mobile payments terminals (e.g., Square, iZettle) and QR-payment applications (e.g., Zapper, LevelUp). As a result, mobile payments solutions will see exponential growth in specific regions and verticals, such as gas stations, events and ticketing, and health and beauty.

- **Nonbanks will continue to lead in peer-to-peer**

Peer-to-peer (P2P) payments remain a stronghold for cash in most markets, as many incumbent banks, being risk-averse or unprepared to cannibalize traditional sources of income, have yet to make an airtight business case for P2P solutions. By contrast, digital innovators, including Pay-Pal, Alipay, TransferWise and Venmo, have realized benefits from P2P payments far beyond authorization, clearing and settlement and threaten to displace traditional banks from this important category of payments.

The main sources of value in P2P include:

- Cross-sell opportunities with related services (e.g., through booking, ordering, shopping, gifting, donating)
- Marketing insights derived from payments and browser data (e.g., used for event-based offers, promotions and marketing)
- High margins among small and medium sized merchants with consumer-like behaviors
- Attractive currency exchange margins on cross-border remittances

- **Bigger, smarter data requires bigger, smarter capabilities**

Knowing how to extract value from data is the core competitive requirement in multichannel commerce. Data-rich solutions use powerful technology to capture and process data across channels and along each step of the value chain in order to provide real-time insights into the needs and preferences of retail consumers, SMEs or large corporations.

Traditional payments companies, burdened with legacy systems and a chronic deficit of top digital talent, must adapt to a new era of cloud-based data warehousing, application program interfaces (APIs), faster solutions development and launch, and periodic reliability-testing (e.g., hackathons) to reap the potential of big data in three areas:

- Dynamic business steering, adjusting aggressiveness in specific customer segments at specific moments of time (e.g., risk appetite, pricing, payments conditions)
- Insights- and behavior-driven marketing, including micro-campaigning, cross-selling, retention
- Data-rich consumer and enterprise applications, simplifying onboarding and servicing, reducing fraud and risk, and enabling spend comparisons

- **Loyalty enters a new age**

Digital loyalty programs have become crucial for merchants to understand the needs and behaviors of their customers and to maintain market share. As a result, merchants are increasingly turning to payments companies to integrate loyalty features with payments services, either as turnkey solutions or by supplementing merchants' proprietary Solutions. Depending on the markets they serve, payments service providers should support one or more of the four main types of loyalty programs:

- Segment-oriented programs, enabling micro-segmentation with tailored offers and service levels (e.g., Amazon Mom, myWaitrose) or segment-specific platforms with tailored campaigning features (e.g., LevelUp, Belly)
- Personalized offers, leveraging consumer purchase patterns to craft specific offers tailored to individual needs and behaviors (e.g., Tesco Club card, BankAmeriDeals)
- Geo-targeting, offering benefits linked to repeat purchase and consumer location (e.g., Groupon, Starbucks)
- Multi-merchant coalitions, where consumers can earn and redeem loyalty currency across a network of merchants (e.g., Air Miles, PayBack)

- **New regulations prompt new service offerings**

Spurred by new regulations, depository institutions and third-party processors (TPPs) will compete directly for transactions and customer data. In Europe, for example, regulations cap interchange fees and open the European Economic Area for cross-border acquiring. Similarly, the new Payment Services Directive (PSDII), now close to final approval, will enable TPPs to access accounts for information (e.g., balance information) and payments initiation.

Partnering with data analytics specialists and digital innovators, TPPs will be able to compete directly with banks for consumer and corporate transactions and the associated data. To fend off the attack, leading depository institutions will need to integrate more diverse financial services on their digital platforms. This will likely entail not only full functionality (account opening and closing, customer service, loan applications) on retail and commercial banking apps but more competitive rates on financing (on the basis of more accurate credit scoring), seamless access to mortgage applications and servicing, mutual funds and stock trades and comprehensive financial planning tools.

- **Cloud-based point-of-sale services enable further specialization**

Increasingly, merchant point-of-sale (POS) applications operate in the cloud, reducing the need for bulky hardware and enabling faster roll-out of new solutions. In addition, recent acquisitions by terminal hardware manufacturers such as Ingenico (which acquired Ogone and GlobalCollect) or Verifone (which acquired Point) signal the strategic importance of pushing merchant offerings beyond the limits of POS hardware.

Commerce is too vast for a single provider to address specific needs in multiple merchant verticals, and specialized providers such as Micros in the restaurant and hospitality segment demonstrate the relevance of vertical specific value propositions (e.g., table booking and mobile payments for restaurants). processors also recognize the value of owning both the payments platform and merchant interface, while allowing other service providers to broaden the offering by using APIs to integrate their services with cloud-based applications.

- **New revenue models strengthen fee income**

The current low interest rates in major markets challenge the economics of what has been the prevailing model for the payments business: interest income on daily balances. Taking a cue from digital companies, where consumers may buy a license, pay a subscription fee or allow access to data in return for using a service for free, banks are adopting pricing models that will build more stable revenue

- **Digital banks prove the shift in the trust paradigm, starting with daily banking**

Digital-native banks, such as Atom Bank (the first to receive a full banking license in the UK) challenge the deeply rooted assumption that physical branches are necessary to generate trust. There is little question, however, that in time consumers and corporate decision-makers will prefer the enhanced convenience, control and value of digital banking to bricks and mortar. Digital banking apps have already become a standard offering across the globe, functioning in some cases as a “control tower” for customer relationships.

While established providers gradually expand the functionality of their banking apps (from view-only information to internal transfers, bill pay, external transfers, etc.), a new generation of digital-native banks is bringing improved standards of cost-efficiency to the industry.

5.4 Key Learnings:

- Cross Border Payments
- Nostro & Vostro Accounts - Nostro literally means “our account with them” and the concept of Vostro literally means “their account with us”.
- Correspondent Banking - a bank which needs to be present in a location but is not present there, has a tie up with another bank which is indeed present in that location.
- Risk management in Correspondent Banking
- Inadequate Due diligence risk
- Information Requirement for payments
- Continuous Linked Settlement - The “continuous” means that the settlement runs continuously in the specified time-window until all the currency time zones are covered; and the “linked” means that the payment made for sold currency is linked to the payment to be received for bought currency.
- CLSB has two types of members: settlement member and user member.
- Process of settlement in CLSB

5.5 Test Your Understanding

1. All economies of the world have a Day Light Credit arrangement which is identical in its construct.
 - a. TRUE
 - b. FALSE

2. When the overseas branch clears a foreign currency check by us the funds will be credited to _____.
 - a. Our account in sending country
 - b. Our Nostro account in that country
 - c. The customer who deposited that check directly

6 SWIFT

Chapter overview:

In this chapter we will get to know in detail about SWIFT. WE will get familiar with various Message Types. We will learn the Message Types and how it is useful in Payments. This chapter also deals with the usage of SWIFT for STP. We will deal in detail with some important MTs.

6.1 Swift solves a communication problem

Banks need to communicate with each other.

Communication is needed between branches of the same bank

Communication is also needed between different branches of the different banks

Generally speaking, financial communication involves asking the other bank/ branch to do something. It will answer to one of the following **Key Words**:

- Pay
- Send
- Remit
- Transfer
- Give
- Credit
- Debit
- Advice etc.

The other bank / branch will respond to the requesting bank/ branch. It will involve one of the following key words:

- Confirm
- Validate
- Reconfirm

Banks also exchange other 'normal' / 'non-critical' information exchange.

6.1.1 The need for Secure Communication:

If instructions received are to be acted upon, receiving bank/branch should be confident that the message is:

- Really from the sender
- Has not been tampered
- Can be reliably acted upon
- Whoever is benefiting from the action is entitled to benefit.

It means this communication needs to be:

- Secure
- Authentic
- Tamper Proof

6.1.2 The Use of Fax Machines

Fax machines at sender bank needs to be accessible only to certain people.

Actually: many can access.

Fax machines at receiver bank needs to be accessible only to certain people.

Actually: many can access.

Faxes are essentially 'photocopy' type image transmitted over communication lines. They may be unclear. The original could be a forgery and then faxed. The paper on which faxes are sent in many machines tends to fade away in about 6 months.

6.1.3 The Use of Telex Machines

Telex is old technology: older than fax. Similar to faxes there were machines at both the sender and the receiver. Operating telex required an operator who could punch the message on a tape. The tape was then fed into the transmitting machine. Errors in coding were a possibility. There was no way of knowing authenticity or accuracy of an incoming machine.

6.1.4 The SWIFT Solution

SWIFT inter-connects all the banks and financial institutions of the world. SWIFT terminals still need to be kept secure. But messages cannot be tampered. They are secure and authenticated; and can be acted upon.

However:

- SWIFT started very differently from what it has become today
- There is a lot of detail to how SWIFT has become effective.

We will look at the history and the detail and mechanics of SWIFT as we go forward.

6.2 SWIFT (Society for Worldwide Interbank Financial Telecommunication)

Provides a network that enables financial institutions worldwide to send and receive information about financial transactions in a secure, standardized and reliable environment. SWIFT also sells software and services to financial institutions, much of it for use on the SWIFTNet Network, and ISO 9362. Business Identifier Codes (BICs) are popularly known as "SWIFT codes".

The majority of international interbank messages use the SWIFT network. As of September 2010, SWIFT linked more than 9,000 financial institutions in 209 countries and territories, who were exchanging an average of over 15 million messages per day (compared to an average of 2.4 million daily messages in 1995). SWIFT transports financial messages in a highly secure way but does not hold accounts for its members and does not perform any form of clearing or settlement.

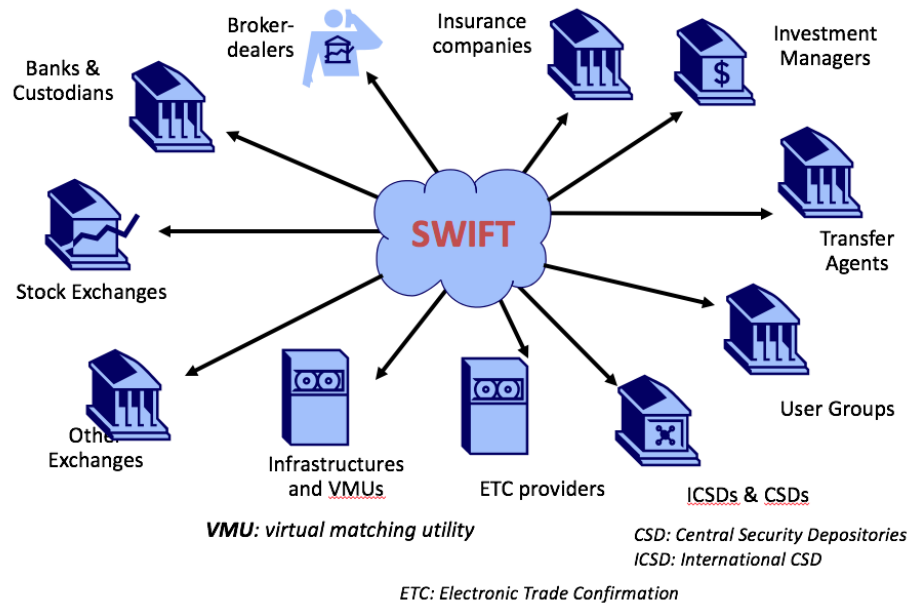
SWIFT does not facilitate funds transfer; rather, it sends payment orders, which must be settled by correspondent accounts that the institutions have with each other. Each financial institution, to exchange banking transactions, must have a banking relationship by either being a bank or affiliating itself with one (or more) so as to enjoy those particular business features.

SWIFT has become the industry standard for syntax in financial messages. Messages formatted to SWIFT standards can be read by, and processed by, many well-known financial processing systems, whether or not the message travelled over the SWIFT network. SWIFT cooperates with international organizations for defining standards for message format and content.

SWIFT is a combination of three things:

- a community of financial institutions;
- a network of the highest security and reliability;
- a standards setting body for electronic financial messaging.

As banks and branches kept getting added to the SWIFT network SWIFT becomes universally installed and enabled. The legacy implies that every financial institution has an address, the hardware, the software, connectivity and personnel that know and operate SWIFT. It proliferates from banking-type communication needs to include securities and all forms of communication needs. So we now have SWIFT interconnecting all manners of institutions:



6.3 SWIFT Architecture / Structure

- **Connectivity:** It is a solution: terminals at both ends; enabling software; encryption; security and tamper proof.
- **Secure Log-On:** Protocols and technology for signing on to a terminal.
- **Message Typology:** A Message Type is to be used only for a specific Transaction Type
- **Message Structure:** Every field in a message is meant to be used in a particular way. The Message Structure also has 5 Blocks of Data Structures
- **Secure Transmission:** it operates on dedicated infrastructure.

Any violation of these rules means the Message is non-standard: Recipients will disregard the message as not being built to standard.

6.3.1 Establishing Connectivity

When a bank joins the network, the new terminal “shakes hands” with all other terminals around the world.

The Relationship Management Application (RMA) filters traffic between two correspondents

- **WHO** can send traffic IN
- **WHAT** type of traffic FIN MT correspondents can send IN
- **WHEN** MT can be sent IN
- Prevents unwanted traffic
- Any correspondent not given permission cannot send IN unwanted FIN traffic.

FIN messages can NOW be exchanged between Bank of America New York with an id: BOFAUS3N & Deutsche Bank with an id: DEUTDFF.

6.3.2 BIC CODE

BIC CODE is the BIC associated through the name and address (that is, physical association) to the NATIONAL ID. However, financial institutions often issue the IBAN together with the BIC of their headquarters / processing centre to their customers rather than the BIC corresponding to its location. It is the IBAN BIC CODE, collected by SWIFT to provide a better match in the scope of SEPA, because using correct IBAN and BICs (that is, the IBAN BIC CODES) offers a considerable reduction in cross-border transaction charges in SEPA.

UNIQUE BIC CODE is the same as the BIC CODE, but is used for search purposes. Indeed several National IDs with a different value may be matched to the same BIC. If a bank wants to convert such a BIC into a national code, they are not able to do so as they would get several values. This is why we have set the UNIQUE BIC CODE, to be able to return a single value of national code (a kind of “primary” national code).

ROUTING BIC CODE is meant for SWIFT messaging purposes. When the IBAN BIC CODE is a non-connected BIC (also called a BIC1), the ROUTING BIC CODE is filled to provide an addressable code on the SWIFT network.

Here are some SWIFT BIC Code examples:

JPMC NY	 JPMorganChase	CHASSUS33
BofA NY	 Bank of America	BOFAUS3N
Lloyds, London	 LLOYDS BANK	LOYDGB21
SBI, Mumbai	 State Bank of India	SBININBB
ANZ, Sydney	 ANZ We live in your world	ANZBAU3M
BTM, Tokyo	 The Bank of Tokyo-Mitsubishi, Ltd.	BOTKJPJT

6.4 SWIFT Message Types

Banks need to communicate with each other.

One Bank is:

- Trying to tell the other bank something
- Get the other bank to do something

Communication in this regard (like ALL communication) needs to be **PRECISE**, unambiguous. Clearly state what you want done. All information relating to what you want done should in that message

The Financial World is also moving/ has moved to STP: the information received from one bank should be high grade enough for systems in the recipient bank to receive and process data as it is - without manual intervention.

ALL data necessary to process the transaction/ message should be received by the downstream bank. Clearly state what you want done. All information relating to what you want done should in that message.

The SWIFT Message Types (MT) help banks achieve that standard of completeness and accuracy. Let us understand MT and its structure.

SWIFT: Message Categories/ MT

Customer Payments & Cheques	MT 1xx
Financial Institutions Transfers	MT 2xx
Treasury Markets – Foreign Exchange, Money Markets & Derivatives	MT 3xx
Collection & Cash Letters	MT 4xx
Securities Markets	MT 5xx
Treasury Markets – Precious Metals / Syndications	MT 6xx
Documentary Credits & Guarantees	MT 7xx
Travellers Cheques	MT 8xx
Cash Management & Customer Status	MT 9xx
Common Group Messages	nxx

6.5 SWIFT message standards

MT to MX: MIGRATION TO ISO 20022

This migration accelerates over 2017.

A. ISO 20022 Overview

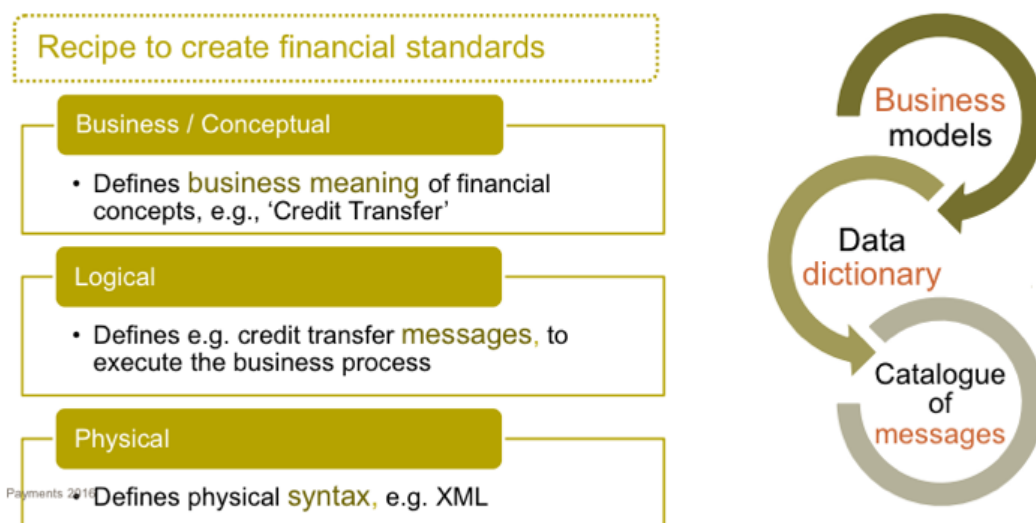
ISO 20022 is a universal financial industry message framework and is the platform proposed for developing all financial messages, as put forth by ISO.

ISO 20022 is a multipart standard, developed and maintained by the ISO Technical Committee responsible for standardization in the field of banking, securities, and other financial services.

ISO 20022 describes a common platform for the development of standardized messages using:

- **A modelling methodology** (based on UML) to capture the business transactions and associated message flows across financial business areas in a syntax-independent way.
- **A central dictionary** of business terms commonly used in communications between financial institutions.
- **A set of XML design rules** to convert the messages described in UML into XML schemas. It should be noted that XML is not a prescribed message syntax, but it is often preferred and is the syntax used in this article.

B. ISO 20022 Framework



- Reasons and Momentum Around ISO 20022

Strategic Reason to Adopt ISO 20022 in U.S.	Description
Global Momentum	Large U.S. corporates and banks are actively adopting ISO 20022 and that is expected to continue.
Global Competition	Compatibility with the ISO 20022 format enables the U.S. to maintain parity with other global markets and U.S. dollar clearing systems in other jurisdictions that are adopting ISO 20022 messaging, which may help preserve the attractiveness of the U.S. dollar as a global currency.
Cost Savings & Processing Efficiency	Standardizing message formats allows for consolidation of payments platforms at banks and corporations, which could promote straight-through processing and drive down costs.
Consistent & Rich Data	While domestic formats support robust data content, ISO 20022 enables all parties to leverage a common set of data dictionary elements to build transactions and messages under an internationally agreed approach.
Interoperability	A common format promotes ease of transacting domestically and globally by using a single, open standard rather than multiple proprietary standards.
Agility to Meet Evolving Regulatory Needs	The ISO 20022 format provides for full originator and receiver information, allowing for improved regulatory reporting and monitoring.
New, Innovative Products	A common format across systems reduces the amount of change required to bring innovative new products and services to market.

MT to MX Equivalents

FIN MT messages		ISO 20022 MX equivalent	
Name	Message Identifier	Name	Message Identifier
Customer Payment	MT 103	FIToFICustomerCreditTransferV03	pacs.008.001.03
Customer Payment	MT 103+	FIToFICustomerCreditTransferV03_STP	pacs.008.001.03 (STP)
Financial Institution Credit Transfer	MT 202	FinancialInstitutionCreditTransferV03_GENERAL	pacs.009.001.03
Financial Institution Credit Transfer Cover	MT 202 COV	FinancialInstitutionCreditTransferV03_COVER	pacs.009.001.03 (COV)
Financial Institution Debit Transfer	MT 204	FinancialInstitutionDirectDebitV01	pacs.010.001.01
Debit Notification	MT 900	BankToCustomerDebitCreditNotificationV03_DEBIT	camt.054.001.03 (DEBIT)
Credit Notification	MT 910	BankToCustomerDebitCreditNotificationV03_CREDIT	camt.054.001.03 (CREDIT)

The Use of DN: Distinguished Name - akin to BIC

A DN is a unique identification of a bank entity

For every BIC, there is a corresponding Distinguished Name (DN) on SWIFTNet.

This Distinguished Name is a unique identifier in the X.500 notation in the form o=<bic8>, o=swift.

For example, if the BIC is ALGEDEFF, then that BIC's DN is: o=algedeff, o=swift

Identifying Departments and People within the DN

Institutions sometimes define more DNs on SWIFTNet to identify departments or geographical locations, applications or individuals. These DNs have one of the forms:

cn=<name>, o=<bic8>, o=swift

or

ou=<name>, o=<bic8>, o=swift

or

cn=<name>, ou=<name>, o=<bic8>, o=swift.

For example, if the institution's BIC8 is ALGEDEFF, and the user's UserID is JOHN, then that user's DN will be:

cn=john, ou=users, o=algedeff, o=swift

SWIFT double-checks DN - BIC8 matching...

The requestor DN and the responder DN tag identify the sending and the receiving party as an X.500 distinguished name, ending with:

o=<SWIFTNet institution BIC-8>,o=swift

SWIFT checks that the BIC8 present in the requestor DN is equal to the BIC8 of the "user distinguished name" in the authorization block.

The full requestor DN combined with the full responder DN is used by SWIFT to verify that the sending/receiving users are registered in the relevant Closed User Group(s).

MT to MX Field level mapping

Available in complete @:

"General Functional Specification of the MX / ISO 20022 migration"

Here are a few samples: MT 103

Pacs.008.001.003 - MX equivalent "pacs.008."