Preface

Payment systems are the indispensable infrastructure for financial markets and business activities. A payment system is a mechanism that facilitates the smooth transfer of funds between financial institutions.

Every commercial trade and financial transaction is finalized only when the final settlement is made through a payment system. If operational failures were to happen in a payment system, which prevented smooth transfers of funds, national economies and financial markets would be thrown into extreme confusion and seriously damaged. Therefore, the safety and efficiency of payment systems is incredibly important for national economies and financial systems to function effectively.

FEATURES OF THIS BOOK

The first feature of this book focuses on the evolutionary trends of payment systems. During the past two decades, payment systems have evolved drastically from simple settlement methods to more highly-sophisticated ways of handling payments. One of major factors in causing such an evolution was the progress of information technology (IT). This book analyzes the evolutionary trends of payment systems and presents an in-depth explanation of how these trends led to the reduction of settlement risk and the improvement of settlement efficiency. The background and driving forces for such innovations are also thoroughly discussed.

The second feature of this book puts a spotlight on the functions and mechanisms of payment systems. The functions of payment systems have become very sophisticated and complicated with the help of technological progress. Some mechanisms were invented to support such advanced payment systems, which include frequent netting, offsetting, matching facility and advanced queue management. This book tries to cast light on the importance of such mechanisms that contributed to the evolutionary progress of payment systems.

The third feature of this book comprehensively covers the basic knowledge about payment systems, which includes some definitions concerning payment and settlement, classifications of payment systems, and origins and reduction measures of settlement risk. In addition, the cases study analyses of payment systems in US, EU and Japan as well as the CLS Bank are provided in the second half of the book. These basic and concrete examples are particularly useful for beginners who want an overview of payment systems.

As a whole, this book will hopefully provide a valuable tool for those interested in learning about payment systems (i.e., academics and researchers, graduate and undergraduate students, relevant parties of authority and central banks, and professionals in payment business who need to get a full understanding of payment systems).
It is my hope that this book will make an intellectual contribution to promoting a better understanding of payment systems for a wide range of interested people, and open up the way to make further progress on enhancing the safety and efficiency of payment systems.

ORGANIZATION OF THE BOOK

The book is organized into four parts and twelve chapters. A brief description of each chapter follows:

Section 1: Basic Knowledge about Payment Systems

Chapter 1 gives an explanation of the basics of “payment systems.” Payment systems are an essential part of financial infrastructure. The chapter sets up the basic knowledge of payment systems to help the reader understand the discussions in the later chapters. The background knowledge includes several aspects of settlements, actors in payment systems, banks as a payment system, the process of payment systems, and the functions of central banks. It also identifies the economic natures of payment systems, such as network externalities, natural monopoly and interdependencies of payment systems.

Chapter 2 presents some classifications of payment systems. Classifications are made from the following standpoints. The first point is the operator of a payment system. Some payment systems are managed by central banks and others are operated by private sectors. The second point is the settlement method. Some payment systems make settlements on a net basis and others settle payments on a gross basis. The third point is the frequency and timing of a settlement. Some payment systems execute settlements only at designated times, and other payment systems make in real-time. The fourth point is the payment value. Some payment systems are mainly for large-value payments and others are for small-value payments. The fifth point is the settlement date. In some payment systems, payments are settled on the same day the payment orders are submitted to the system. In other payment systems, payment orders are not settled until the next day, where overnight settlement risk resides. The last point is the settlement asset. Some payment systems use “central bank money” as a settlement asset and others make use of “commercial bank money.” These classifications are useful to understand basic payment systems as well as advanced payment systems which are discussed in the later chapters. Needless to say, these classifications are not mutually exclusive. Instead, one can use a combination of these classifications in order to describe a payment system.

Chapter 3 discusses “settlement risk.” During the process from trade to its settlement, there is a risk that the settlement will not take place as expected. This is the settlement risk which may cause a liquidity problem and/or loss to the party involved in the settlement. First, the source of settlement risk is identified in two kinds of settlements; simple settlements and exchange-for-value settlements. Second, the differences are clarified between the settlement risk and the pre-settlement risk. Third, it gives the classifications of settlement risk, which includes credit risk, liquidity risk, systemic risk, legal risk and operational risk. Fourth, it makes clear the difference between the principal risk and replacement cost risk. Fifth, it gives actual examples, in which settlement risk turned into reality. They include the Herstatt Bank incident, the BCCI incident and the Bearing incident. Finally, after identifying the exposures of settlement risk, reduction measures of the settlement amount and time-lag are discussed. Several mechanisms, such as netting, Payment versus Payment (PVP), and Delivery versus Payment (DVP) are of significant importance in reducing settlement risk.
Section 2: Basic Payment Systems and Advanced Payment Systems

Chapter 4 provides comparisons between the two basic payment systems, the Designated- Time Net Settlement (DTNS) system and the Real-Time Gross Settlement (RTGS) system. Those comparisons are indicative of the difference between the two systems and highlight the characteristics of each system. The DTNS system and the RTGS system have their own advantages and drawbacks. The RTGS system is far superior to the DTNS system from the viewpoint of the reduction of settlement risk. Conversely, the DTNS system has an advantage on the aspect of liquidity required for a settlement. In sum, this chapter shows that there is a trade-off between the DTNS system and the RTGS system, or more concretely between safety and efficiency in payment system. This is the essential starting point to review the development of the advanced payment systems in the later chapters.

Chapter 5 takes an analytical approach to two advanced payment systems; the “Hybrid system” and the “Integrated system.” The Hybrid system is a system which combines the liquidity-savings features of the DTNS system with the immediate finality of the RTGS system. The Hybrid system is characterized by frequent net settlements during the day. The Integrated system is a payment system which has both the RTGS mode and the Hybrid mode. The participants of an Integrated system can use the RTGS mode for urgent payment and utilize the Hybrid mode for non-urgent payment. These advance payment systems are supported by several sophisticated mechanisms achieved through the progress of information technology. The chapter gives an explanation of such mechanisms, which include (i) frequent netting and continuous processing, (ii) partial netting, (iii) offsetting, (iv) searching and matching facility, (v) queue management function, (vi) pre-funding account, and (vii) multiple functions in a single payment system.

Section 3: Innovations in Payment Systems

Chapter 6 presents an analysis about the evolutionary process of payment systems. Payment systems showed remarkable changes in the past two decades. The first evolutionary trend was the transition from the traditional DTNS systems to the RTGS system. A technology diffusion analysis of the RTGS technology across the world is also presented. The next step in the evolution of payment systems was the introduction of the Hybrid system. Several Hybrid systems in Europe and the US are discussed in detail. The third trend was the introduction of Integrated system. Emergence of some Integrated systems are discussed, which include the LVTS in Canada, the PIS in France, the MEPS+ in Singapore, the TARGET2 in EU and the Next Generation BOJ-NET in Japan. And then, a hypothesis on the typical evolutionary pattern from the simple DTNS system to a more sophisticated system is proposed.

The chapter also reviews another line of evolutionary trends, including “Multi-Currency Payment Systems” and “Offshore Payment Systems,” and the linkage between a payment system and a Securities Settlement System (SSS). It also gives an explanation about the adoption of Financial EDI capability, which is the scheme that enables the processing of the remittance information with payment instructions in the payment system.

Chapter 7 makes an analysis of the driving forces leading to the evolutionary progress of payment systems, as mentioned above. The first driving force was the growing recognition of settlement risk. As the values of payments over payment systems increased dramatically in the past two decades, the central banks worried about the substantially-increased settlement risk. It was one of the biggest motivations in improving payment systems in each country. Second, several reports by the Bank for International Settlements (BIS) triggered the reforms on payment systems in each country. Such reports include the “Core
Principles Report,” the “RTGS Report,” and the “Lamfalussy Report.” Third, the competition between payment systems played a role. The competition between the CHIPS and the Fedwire in US was typical case. Lastly, the progress of IT played a critical role. Enhanced computer capacity, improved communication networks and reduced technology costs contributed greatly to the innovation in payment systems.

Chapter 8 discusses the public policy matters which should be considered in designing and evaluating the payment systems. First, the governance structures of payment systems are discussed. Governing approaches essentially affect the way payment systems are managed, including participation rules, risk management schemes and the efficiency of the system. Second, the legal issues with payment systems are reviewed. It goes without saying that a payment system should have a well founded legal basis. The third point of public policy matters is operational reliability of payment systems. As payment systems become increasingly dependent on computers and networks, the operational reliability of the system is a key element in preventing operational risk. The last point discussed is the efficiency of payment systems. As payment systems enjoy a monopoly situation in many countries, there are no market forces urging payment systems to achieve the cost-efficiency. Therefore, it is important for payment system operators to make the cost-efficiency of a system their own initiative.

Section 4: Developments of Payment Systems in Selected Countries

Chapter 9 provides a case study on the payment systems in the US. The Fedwire and the CHIPS are the Large-value payment systems in US which handle interbank payments for the money market, government bond market, and FX market. The Fedwire is a central bank payment system, owned and operated by the Federal Reserve. The CHIPS is a private payment system, owned and operated by TCH Payments Co. The Fedwire is operated as a RTGS system. The CHIPS belongs to the Hybrid system, where net settlements are made continuously during the day. The new settlement method of the CHIPS (i.e., the “CHIPS Finality”) is scrutinized closely in the chapter.

The chapter also describes the Retail payment system in the US, the Automated Clearing House (ACH). The ACH is a nationwide electronic file transfer mechanism that processes retail transfers between customer accounts. The functions of FedGlobal ACH and Financial EDI in the ACH network are also discussed.

Chapter 10 provides detail on the payment systems in the EU. The landscape of payment systems in the EU was changed drastically by the introduction of a single currency, the “Euro” in January 1999.

As for the Large-value payment system, the TARGET was introduced in 1999, which was a distributed system that linked the national RTGS systems with an interlinking network. The TARGET2 was introduced in 2007-2008 to replace the first-generation TARGET. The TARGET2 is a centralized system with a single platform and has a series of sophisticated mechanisms. The EURO1 is another Large-value payment system operated by the EBA CLEARING.

The Retail payment systems in EU are still fragmented, which means that each country has its own Retail payment system. In order to overcome such a situation, the European Central Bank (ECB) and European Commission have promoted the Single Euro Payment Area (SEPA) project. The detail of the SEPA project is described in this chapter.

Chapter 11 takes a close look at the payment systems in Japan. There are three payment systems in Japan: the BOJ-NET, the FXYCS and the Zengin System. The BOJ-NET is the equivalent of the Fedwire in the US, and the TARGET2 in Europe. It was operated as a RTGS system and then enhanced into an Integrated system in 2008. The Next-Generation RTGS (RTGS-XG) project is described in detail in this chapter.
The FXYCS is a payment system that handles the JPY-leg payments for FX transactions. In this sense, the FXYCS is the equivalent of the CHIPS in the US. The Zengin System is a national fund transfer network for retail payments, which is the equivalent of the ACH in the US. The Zengin System is planned to be upgraded to a sixth generation system in 2011. The details of the new mechanisms of the six generation system are described in the chapter.

Chapter 12 focuses on the CLS Bank. CLS Bank was established in 1999 to eliminate settlement risk associated with settling FX transactions in different time zones. Although CLS Bank was established as a private bank in the US, its function is dedicated to providing a multi-currency settlement service. Thus, CLS BANK should be regarded as one of the payment systems. This chapter elaborates on the mechanism of CLS Bank, which includes the organization, the shareholders, the eligible currencies, and the accounts used for CLS settlements. The funding and settlement procedures and risk management schemes of CLS Bank are discussed in greater detail. In addition, the impact of CLS Bank on FX settlements and the FX market is also analyzed.

REFERENCES


