

## **Payment, clearing and settlement systems in China**



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## List of abbreviations

ABS	Central Bank Accounting Booking System
ATM	automated teller machine
BEPS	Bulk Electronic Payment System
CBBS	Central Bond Bookkeeping System
CBGS	Central Bond Generalized System
CBRC	China Banking Regulatory Commission
CCP	central counterparty
CCPC	City Clearing Processing Center
CCCB	Clearing Center for City Commercial Banks
CCDC	China Central Depository & Clearing Co., Ltd.
CDFCPS	China Domestic Foreign Currency Payment System
CFETS	China Foreign Exchange Trading System
CFSTC	China Finance Standardization Technical Committee
CIRC	China Insurance Regulatory Commission
CIS	Cheque Image System
CMU	Central Moneymarkets Unit
CRMW	Credit Risk Mitigation Warrants
CSRC	China Securities Regulatory Commission
CNAPS	China National Advanced Payment System
CNCC	China National Clearing Center
DAP	delivery after payment
DVP	delivery versus payment
ECDS	Electronic Commercial Draft System
FOP	free of payment
HKMA	Hong Kong Monetary Authority
HVPS	High-Value Payment System
IBPS	Internet Banking Payment System
IC	integrated circuit
L/C	letter of credit
MOF	Ministry of Finance
NPC	National Processing Center
OTC	over-the-counter
PAD	payment after delivery

*China*

PBC	The People's Bank of China
POS	point of sale
RCBFCC	Rural Credit Banks Funds Clearing Center
RMB	renminbi
RTGS	real-time gross settlement
SCP	Super & Short-term Commercial Paper
SD&C	China Securities Depository and Clearing Corporation Limited
SHCH	Shanghai Clearing House
STP	straight through processing

## Introduction

In recent years, China's national payment system has progressed remarkably and has played an important role in driving the country's economic and social development. Following the diversification of payment service providers, a framework of market players has been formed. Payment services have become increasingly market-oriented.

The RMB bank settlement account management system has been continuously improved, and administration for financial accounts based on real names<sup>1</sup> has been strengthened. A range of non-cash payment instruments are widely used, with negotiable instruments and bankcards accounting for the main part, supplemented by internet payments, telephone payments and other electronic payments.

China has set up an architecture with the payment systems of the People's Bank of China (PBC) as the backbone, the payment systems of banking institutions as the main part and systems such as the interbank bankcard transaction clearing system, foreign exchange settlement system and securities settlement system as important components. PBC has developed several interbank payment systems, including the High-Value Payment System (HVPS, an RTGS system), the Bulk Electronic Payment System (BEPS), the Cheque Image System (CIS), the Internet Banking Payment System (IBPS) and the China Domestic Foreign Currency Payment System (CDFCPS). HVPS and BEPS are the application systems of the China National Advanced Payment System (CNAPS).

The three main providers of securities settlement systems in China are China Central Depository & Clearing Co., Ltd. (CCDC), Shanghai Clearing House (SHCH) and China Securities Depository and Clearing Corporation Limited (SD&C). Trades from the interbank bond market are settled via CCDC and SHCH, and trades from the exchange bond market are cleared and settled via SD&C. SD&C also provides stock exchange markets with such services as centralised registration, custody, clearing and settlement.

The supervision and administration framework for China's national payment system has taken shape. The risk prevention capability of the system is being continuously enhanced, following the establishment of a legal framework for payment and settlement.

## 1. Institutional aspects

### 1.1 The general institutional framework

The *Law of the People's Republic of China on the People's Bank of China* (*Law on the People's Bank of China*) was promulgated in 1995 and amended in 2003. According to the law, PBC's responsibilities are to "maintain the normal operation of payment and clearing systems in China". The *Law of the People's Republic of China on Commercial Banks* (*Law on Commercial Banks*) amended in the same year stipulates that PBC has the right to supervise and regulate commercial banks in accordance with the *Law on the People's Bank of China*.

The *Securities Law of the People's Republic of China* (*Securities Law*), promulgated in 1998 and amended in 2005, serves as the highest-level legal norm governing securities registration and settlement activities. The law explicitly defines the responsibility of the China Securities Regulatory Commission (CSRC) for the supervision and administration of securities registration and settlement institutions and businesses in the securities market. It

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<sup>1</sup> It is not permitted to open anonymous accounts or accounts in fictitious names in financial institutions.

also stipulates the related legal relations among securities registration and settlement institutions and the important principles for securities registration and settlement activities.

### **1.1.1 Payment instruments and payment systems**

The *Law of the People's Republic of China on Negotiable Instruments* (*Law on Negotiable Instruments*), promulgated in 1995 and amended in 2004, governs such activities as issue, endorsement, acceptance, guarantee, payment and claim related to drafts, promissory notes and cheques. It also defines the rights, obligations and legal responsibilities of the parties involved in negotiable instrument activities.

The *Regulations of the People's Republic of China on Administration of Renminbi*, promulgated in 2000, provides for the design, printing, issuance, withdrawal and circulation of RMB. It also defines the rights, obligations and legal responsibilities of institutions and individuals in the use of RMB. The *Interim Regulations on Cash Management*, promulgated in 1988, stipulate the amount and use of RMB retained by institutions.

Apart from the above laws and regulations, the *Administrative Measures for Implementation of Negotiable Instruments* and the *Measures for Payment and Settlement* were promulgated in 1997, providing for the basic business rules of various payment instruments and legal responsibilities of different parties involved in transacting negotiable instruments. The *Administrative Measures for Bankcard Business* promulgated in 1999 lay down the rules for bankcard business, interest rates and fees, account and transaction management, risk management and legal responsibility. The *Administrative Measures for RMB Bank Settlement Accounts* promulgated in 2003 regulate the opening, use and management of settlement accounts. The *Administrative Measures for Payment Services Provided by Non-financial Institutions* promulgated in 2010 define the market access, supervision and administration of payment institutions undertaking online payment, issue and acceptance of prepaid cards and acquisition of bankcards.

### **1.1.2 Securities clearing and settlement**

PBC and CSRC are responsible for the oversight and administration of the interbank bond market and the stock market, respectively. The Ministry of Finance (MOF) and China Banking Regulatory Commission (CBRC) have also assumed some responsibility for the oversight and administration of the interbank bond market.

The *Administrative Measures for Bond Transactions in the National Interbank Bond Market* and the *Administrative Measures for Registration, Custody and Settlement of Bonds in the Interbank Bond Market* formulated by PBC stipulate the qualifications of participants and bond registration, trading, custody and settlement in the interbank bond market. The *Interim Administrative Measures for Custody of Treasury Bonds of the People's Republic of China* formulated by the MOF aim at protecting the legitimate rights and interests of treasury bond investors and regulate treasury bond custody activities.

The *Administrative Measures for Securities Registration and Settlement* promulgated in 2006 and amended in November 2009 by CSRC form the legal basis regulating securities registration and settlement. They provide for the important principles, basic procedures for securities registration , clearing and settlement, and the legal relationship among related market players.

The *Measures for the Administration of Securities Settlement Risk Fund* were jointly promulgated by CSRC and MOF in 2006 and formally implemented the same year. The securities settlement risk funds are earmarked funds formed according to the Measures. These funds are used to make up for the losses of securities registration, clearing and settlement institutions incurred due to default, technical failure, maloperation or force majeure, for the purpose of preventing and hedging securities market risks and maintaining the safe operation of securities registration, clearing and settlement systems.

## 1.2 The role of the central bank

### 1.2.1 Supervision and administration

The People's Bank of China issues RMB, manages the circulation of RMB and administers its own banknote printing and coin minting enterprises according to the *Law on the People's Bank of China*. Apart from design, printing and issuance of RMB, PBC is also responsible for recalling and destroying damaged or spoiled RMB as well as authenticating RMB.

PBC oversees RMB accounts from the aspects of implementation of the real-name policy and normalisation of routine use of the RMB account, in accordance with laws and regulations such as Article 16.5 and Article 32.1.4 of the *Law of the People's Republic of China on Anti-Money Laundering (Anti-Money Laundering Law)* and the *Provisions Concerning the Real-Name Personal Deposit Account System* (No.285 Decree of the State Council of the People's Republic of China). PBC is responsible for the management of the reserve accounts opened by financial institutions with PBC and settlement accounts opened by customers with banking institutions. According to the *Administrative Measures for RMB Bank Settlement Accounts* promulgated in 2003, opening or cancellation of bank settlement accounts for their customers shall be approved by or filed with PBC.

PBC is legally authorised to penalise the depositors and banking institutions which violate the regulations on the management of bank settlement accounts, and oversees the opening, use, modification and cancellation of bank settlement accounts through on-site and off-site inspection. On-site inspection mainly focuses on the annual inspection conducted by PBC branches for the bank settlement accounts within their respective jurisdiction. Off-site inspection refers to the filing or approval of bank settlement accounts by the RMB bank settlement account management system.

According to Article 108 of the *Law on Negotiable Instruments* "the administrative measures for format and printing of negotiable instruments shall be stipulated by PBC". PBC is responsible for the administration of format and printing of negotiable instruments. Article 109 of the *Law on Negotiable Instruments* stipulates that "the specific implementation measures for the administration of negotiable instruments shall be formulated by PBC according to the law and implemented with the approval of the State Council"; Articles 31 and 34 of the *Administrative Measures of Implementation of Negotiable Instruments* stipulate that an administrative penalty shall be imposed on those issuing dud cheques, issuing cheques with signatures/seals inconsistent with the specimen held in banks, or printing negotiable instruments without authorisation.

PBC lays down payment and settlement rules jointly with the State Council's banking regulator in compliance with Article 27 of the *Law on the People's Bank of China*, and oversees the payment and settlement business of banking institutions accordingly. Regulatory measures include inspection, penalty, public criticism and moral suasion. Furthermore, PBC is responsible for policies around the development of the bankcard industry and plays an important role in improving the bankcard environment with its related technical standards to prevent bankcard risks and bankcard crime.

The *Law on the People's Bank of China* has three articles defining PBC's role as a catalyst, operator and regulator of payment, clearing and settlement systems.<sup>2</sup> Any institution or

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<sup>2</sup> Article 4.9 of the Law on the People's Republic of China states "Maintaining the normal operation of the payment, clearing, and settlement systems"; Article 27 states "The People's Bank of China shall organize or assist in organizing clearing systems among banking institutions, coordinate the efforts of such institutions in matter of clearing and provide services in this regard"; and Article 32 states "The People's Bank of China shall have the right of inspecting the implementation of relevant clearing regulations for banking institutions and other institutions and individuals".

individual in violation of relevant provisions of clearing services shall be subject to moral suasion, warning, confiscation of illegal income or imposition of a fine; those committing a crime shall be subject to criminal liability. Moreover, PBC is responsible for the market access of payment services of non-financial institutions and regulation of their payment activities.

PBC is also committed to the development of the bond market and supervises and administers the interbank bond market according to the *Law on the People's Bank of China*. PBC conducts open market operations and implements monetary policy through the interbank bond market.

PBC, as the administrative authority in charge of China Finance Standardization Technical Committee (CFSTC), is responsible for the organising, administration and coordination of financial standardisation. PBC formulates technical specifications and business standards via the CFSTC.

### **1.2.2 Provision of clearing services**

Since 2002, PBC has developed a number of interbank clearing systems, including the China National Advanced Payment System (CNAPS), China Domestic Foreign Currency Payment System, and local clearing systems, to support the application of negotiable instruments, bankcards and other payment instruments. CNAPS is operated by the China National Clearing Center (CNCC) and local clearing systems are mainly operated by PBC branches. At the end of 2010, PBC branches owned and operated 1,017 local clearing houses which provide clearing services for cheques, bank drafts, commercial drafts and banker's promissory notes, etc.

As the bank of the government, PBC has the responsibility of managing the state treasury, managing single accounts of the treasury and overseeing the opening of fiscal deposit accounts. It also provides related services for government payments.

### **1.2.3 Cooperation with other regulators**

Under the leadership of the State Council, PBC has established a financial supervision coordination mechanism with CBRC, CSRC and China Insurance Regulatory Commission (CIRC) (hereinafter collectively called "PBC and the three commissions"). PBC and the three commissions have strengthened the cooperation and coordination in formulating and implementing monetary and regulatory policies through interdepartmental meetings. They share financial information and jointly study major issues in the financial field, analyse situations and put forward suggestions on prevention of crises and potential risks on a regular or irregular basis.

In March 2009, PBC signed the memorandum of understanding with the Hong Kong Monetary Authority (HKMA) on issues concerning interconnection between a number of monetary payment systems of the Chinese mainland and Hong Kong. In June, PBC and HKMA signed a supplementary memorandum of cooperation, and reached a consensus on the provision of RMB settlement services by banks in Hong Kong. In December 2009, PBC and the Monetary Authority of Macao signed a supplementary memorandum of regulatory cooperation, reaching agreement on regulating individual RMB services and cross-border RMB settlement services provided by banks in Macao, according to their respective responsibilities.

PBC has established a cross-border supervision cooperation mechanism with the central banks of the countries/regions issuing related settlement currencies of the China Domestic Foreign Currency Payment System (CDFCPS), and provides related operation data to these central banks on a quarterly basis.

## 1.3 The role of other private and public sector bodies

### 1.3.1 Payment service providers

#### 1.3.1.1 Banking institutions

Banking institutions are commercial banks, urban and rural credit cooperatives and other financial institutions that take deposits from the public. Banking institutions also include policy banks<sup>3</sup> set up within the territory of the People's Republic of China. According to the *Law on Commercial Banks*, banking institutions may engage in payment and settlement business with the approval of the State Council's banking regulator. Banking institutions are the primary providers in the payment services market, offering a range of payment services to the general public via their network in urban and rural areas.

#### 1.3.1.2 Non-bank financial institutions

Finance companies of enterprise groups (finance companies) are non-bank financial institutions established to enhance the centralised management and improve the efficiency of the funds of enterprise groups, and to provide financial management services for members of groups. According to the *Measures for the Administration of Finance Companies of Enterprise Groups* issued by CBRC, finance companies may provide services of collecting and paying money, accepting bills, discounting bills and so on to their members.

Without approval from PBC, any non-bank financial institution is forbidden to engage in payment and settlement business.

### 1.3.2 Institutions providing clearing and settlement service

#### 1.3.2.1 China UnionPay Co., Ltd.

China UnionPay Co., Ltd. (China UnionPay) is approved and overseen by PBC to provide clearing services for bankcard transactions between issuing institutions and acquiring institutions. It was jointly initiated and established by domestic banking institutions in March 2002 and has its head office in Shanghai.

#### 1.3.2.2 Clearing Center for City Commercial Banks (CCCB)

CCCB, a non-profit-oriented entity for its members, mainly engages in clearing services and other business approved by PBC. It was initiated by city commercial banks in September 2002 and is registered in Shanghai. It clears transactions relating to bank drafts, online payments, and interbank deposits and withdrawals. It mainly serves city commercial banks, urban credit cooperatives and rural banks.

#### 1.3.2.3 Rural Credit Banks Funds Clearing Center (RCBFCC)

RCBFCC provides clearing services for real-time electronic fund transfers, bank drafts, and interbank deposits and withdrawals for China's rural credit cooperatives, rural commercial banks, rural cooperative banks and other local financial institutions. RCBFCC was jointly set up by 30 provincial rural credit unions, rural commercial banks and Shenzhen Rural Commercial Bank, and is registered in Beijing.

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<sup>3</sup> Export-import Bank of China and Agricultural Development Bank of China.

#### 1.3.2.4 Local clearing houses

Local clearing houses are institutions that provide physical negotiable instrument exchanges or clearing services for local banking institutions. At the end of 2010, there were 144 local clearing houses owned and operated by private entities in China.

#### 1.3.2.5 China Central Depository & Clearing Co., Ltd. (CCDC)

Founded in 1996, CCDC is responsible for the registration, custody and settlement of most fixed income securities on the interbank bond market. It has linkage with the Open Market Operations System of PBC and provides intermediary and information services in the bond market.

#### 1.3.2.6 Shanghai Clearing House (SHCH)

Founded in 2009, SHCH mainly provides RMB and foreign currency clearing services for both spot and derivatives markets. It is primarily engaged in registration, depository, clearing, settlement, margin management, collateral management, as well as information and advisory services. At present, it provides clearing, settlement, registration and depository services for such financial products as Credit Risk Mitigation Warrants (CRMW) and Super & Short-term Commercial Paper (SCP). SHCH is regulated and overseen by PBC.

#### 1.3.2.7 China Securities Depository and Clearing Corporation Limited (SD&C)

Founded in 2001 and registered in Beijing, SD&C is the sole operator of the registration, clearing and settlement system for the stock market. SD&C has a Beijing Data Branch, a Shanghai Branch and a Shenzhen Branch. It is a non-profit-oriented legal entity established with the approval of CSRC. With its securities clearing and settlement system covering the Shanghai Stock Market and Shenzhen Stock Market and also acting as a central counterparty (CCP) for these two markets, SD&C provides centralised registration, depository, clearing and settlement services on the securities market, and conducts industry self-discipline management.

### 1.3.3 Role of other private and public sectors

CFSTC is an organisation drafting standards for the financial sector, under the leadership of PBC. The experts of CFSTC come from PBC, CBRC, CSRC, CIRC, financial institutions and research institutions. During the development of standards, CFSTC widely consults with banks, payment institutions, merchants and end users. These standards help to promote the IT application of banking business.

## 2. Payment media used by non-banks

### 2.1 Cash payments

Cash is primarily used in face-to-face retail payments. Cash is mostly held by domestic residents, enterprises and institutions. Only a small amount of cash flows to foreign countries.

At the end of 2010, cash in circulation ( $M_0$ ) amounted to CNY 4,462.8 billion (Table 1). During 2006–10,  $M_0$  maintained a high growth rate, higher than that of GDP.  $M_0$  increased by 64.84% in 2010 as compared to 2006.

Table 1  
**Cash in circulation in China, 2006–10**

	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
M <sub>0</sub> (CNY 100 million)	27,073	30,334	34,219	38,247	44,628
Year-on-year growth (%)	–	12.05%	12.81%	11.77%	16.68%

Source: China Payment System Development Report.

At present, RMB banknotes are available in denominations of 1 jiao, 2 jiao, 5 jiao, 1 yuan, 2 yuan, 5 yuan, 10 yuan, 20 yuan, 50 yuan and 100 yuan, while coins have values of 1 fen, 2 fen, 5 fen, 1 jiao, 5 jiao and 1 yuan. PBC also issues a certain amount of negotiable ordinary commemorative coins (notes) for significant events.

## 2.2 Non-cash payments

### 2.2.1 Non-cash payment instruments

Non-cash payment instruments mainly include negotiable instruments, bankcards and remittances. In 2010, in terms of volume, they accounted for 3.24%, 92.97% and 3.69%, respectively, of total transactions using non-cash payment instruments. In terms of value, the respective percentages were 31.43%, 27.26% and 40.07% (Table 2).

Table 2  
**Market share of main non-cash payment instruments in China, 2006–10 (in per cent)**

	<b>2006</b>		<b>2007</b>		<b>2008</b>		<b>2009</b>		<b>2010</b>	
	<b>Volume</b>	<b>Value</b>								
Negotiable instruments	9.23	47.87	6.33	39.88	4.81	39.71	4.09	37.73	3.24	31.43
Bankcards	84.54	15.04	88.10	18.80	90.96	20.09	91.95	23.19	92.97	27.26
Remittances	4.89	34.88	4.45	39.80	4.03	38.99	3.82	37.75	3.69	40.07

Source: China Payment System Development Report.

#### 2.2.1.1 Cheques

Cheques can be used to withdraw cash and transfer funds, and are mainly used for making payments by governments and enterprises. In 2010, about 872 million cheques were issued, for a total amount of CNY 260.5 trillion, accounting for 92% of total transaction value of negotiable instruments.

Cheques used in local areas are generally cleared by local clearing houses, and physical bills are delivered to drawers' banks via clearing houses. If a cheque is not bounced within the required time, the payee bank has to transfer the money to the beneficiary account.

In 2007, PBC set up the Cheque Image System (CIS), which achieves cheque image transmission and truncation of physical cheques. It allows for the nationwide use of cheques with an amount below CNY 500,000. In 2010, a total of 8,784,300 transactions were processed via CIS, with a total amount of CNY 404,246 million. Cheque drawers pay CNY 30 to acquire a chequebook containing 25 cheques.

PBC, together with HKMA, launched a two-way settlement of HKD cheques and one-way settlement of RMB cheques in Guangdong Province and Hong Kong. RMB cheques are only used for consumption in Guangdong Province by Hong Kong residents, with a maximum amount of CNY 80,000 per cheque. Two-way settlement of USD cheques was launched in Shenzhen and Hong Kong. Cross-border cheque exchange is carried out by domestic clearing centres and Hong Kong Interbank Clearing Limited. Cross-border funds clearing is carried out via clearing agents. In 2010, 366,800 HKD cheques, 15,000 USD cheques and 700 RMB cheques were handled with a total amount of HKD 41,847 million, USD 450 million and CNY 35 million, respectively.

Any dud cheque or cheque with the signature and seal inconsistent with the specimen held in the bank is bounced, and the drawer will be fined by PBC at 5% of the par value but not less than CNY 1,000. The bearer has the right to demand compensation at 2% of the par value from the drawer. Any institution or individual that issues dud cheques frequently will be forbidden to issue cheques.

Since 2010, drawers have been able to apply for a credit facility from banks. A bank will credit the drawer's account within the predetermined credit line. The cheque credit facility is popular among banks and small to medium-sized enterprises.

#### 2.2.1.2 *Bank drafts*

Bank drafts are a kind of negotiable instrument issued by a bank for enterprises or individuals after they deposit in the bank, used to handle inter-city funds transfers or cash withdrawals. Bank drafts are classified as national drafts or (the majority) regional drafts (limited to use in Jiangsu, Zhejiang and Anhui provinces and Shanghai). Regarding drafts for funds transfer issued by different banks, the drafts are to be delivered to the relevant banks for review and disbursement through local clearing houses. After disbursement of a draft, the clearing and settlement between drawer banks and correspondent banks is processed via PBC. In addition, small and medium financial institutions with only a few branches making payments by bank drafts may do this via RCBFCC or CCCCB. In 2010, the transaction volume and value of bank drafts reached 6,792,400 and CNY 4 trillion, respectively.<sup>4</sup>

BEPS has handled regional drafts since December 2008. Correspondent banks accept and review interbank drafts submitted by bearers. Then, they send the related information to drawer banks via BEPS, and pay in real time upon receipt of funds from drawer banks. Bank draft applicants pay a commission of CNY 1 per draft to drawer banks.

#### 2.2.1.3 *Commercial drafts*

Commercial drafts are a kind of negotiable instrument issued by enterprises to entrust the payer to pay the specified amount to the beneficiary or the bearer on the designated date unconditionally. Commercial drafts are divided into commercial acceptance drafts and banker's acceptance drafts. Commercial draft's payers are the acceptors. Commercial acceptance drafts are accepted by payers other than banks, while banker's acceptance drafts are accepted by banks. Banks may charge 0.05% of par value when accepting.

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<sup>4</sup> Accounting for 0.76% and 1.41% of the total volume and value of negotiable instrument transactions, respectively.

Commercial drafts are applicable to commodity transactions. The buyer and the seller may determine a payment period within six months or one year in the case of electronic commercial drafts. The bearer may purchase commodities with the accepted drafts or apply to discount. Upon expiration of commercial drafts, the beneficiary or bearer entrusts its bank to present the draft to the payer bank by exchange or mail. Interbank clearing of commercial drafts is processed by PBC. In 2010, the actual transaction volume and value of commercial draft payments reached 9,367,100 transactions and CNY 10.85 trillion.<sup>5</sup>

The Electronic Commercial Draft System (ECDS) of PBC was put into operation in October 2009, and rolled out nationwide in June 2010, and is also used to support dematerialisation of paper-based commercial drafts with seals or signatures. ECDS minimises fraud risk of commercial drafts. It can support issuances, endorsements, discounts, interbank discounts, rediscounts, pledges, cancellation of pledges, guarantees, presentations and recourses of electronic commercial drafts. Interbank fund clearing of electronic commercial drafts is processed by PBC.

In 2010, 320 banks and finance companies were engaged in electronic commercial draft business, and a total of 284,100 transactions were processed by ECDS, with a total amount of CNY 1 trillion.

#### *2.2.1.4 Banker's promissory notes*

Banker's promissory notes are issued by a bank to an applicant after depositing in the bank. They can be used for funds transfers or withdrawals, or be endorsed within the same clearing region. The note should be payable at sight. With respect to notes with different banks, correspondent banks may charge interest from issuing banks at the interbank offered rate. Banker's promissory notes are widely used in some relatively developed cities and in the regions with a prosperous commodity market.

BEPS has handled banker's promissory notes since May 2008. Correspondent banks receive and review the notes submitted by bearers, then send related information to issuing banks via BEPS, and pay in real time upon receipt of funds from issuing banks. The correspondent banks may not charge interest on funds paid in advance.

In 2010, a total of 7,860,600 banker's promissory notes were issued, for an amount of CNY 8.61 trillion.<sup>6</sup>

#### *2.2.1.5 Bankcards*

All bankcards are issued by commercial banks and are bundled with functions such as consumption credit, funds transfer, deposit and withdrawal. Bankcards are divided into debit cards and credit cards. Credit cards have a maximum interest-free repayment period of 60 days. Credit card holders can apply for supplementary cards.

Bankcards are the most popular payment instrument for residents. Debit cards account for around 80% of all cards. At the end of 2010, more than 2.4 billion bankcards had been issued. Expenditure by bankcard (excluding real estate, automobile sales and wholesale transactions) accounted for 35.1% of the total value of retail sales.

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<sup>5</sup> Accounting for 1.04% and 3.82% of the total volume and value of negotiable instrument transactions.

<sup>6</sup> Accounting for 3.02% of total negotiable instrument transactions.

Table 3  
**Bankcards issued, 2006–10**

Year-end figures

	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Number of cards (in millions)	1,131	1,500	1,800	2,066	2,415

Source: China Payment System Development Report.

In 2005, PBC issued the *China Financial Integrated Circuit Card Specifications* (JR/T 0025-2005) as the basic technical standards for integrated circuit (IC) card applications in the financial sector. China launched pilot projects for financial IC card applications, and gradually introduced IC cards into such fields as social insurance, transport and medical treatment.

#### 2.2.1.6 Remittances

Remittances mainly involve credit transfers. They have been the primary means of inter-city payment for a long time. The value of remittances accounts for the largest proportion of that of payment instruments. Interbank remittances are generally processed by PBC. Part of local remittances is processed by local clearing systems. In addition, remittances originated by small and medium financial institutions with only a few branches may be cleared via RCBFCC or CCCCB. The volume of remittances reached 1,022 million transactions in 2010, for a total amount of CNY 362.72 trillion.

#### 2.2.1.7 Domestic letters of credit (domestic L/C)

Domestic L/C are issued by a bank to the beneficiary at the request of the applicant, within a specified period based on the related documents. In 2010, the volume and value of domestic L/C reached 61,200 transactions and CNY 557,316 million.

#### 2.2.1.8 Regular debit/credit

Regular debit is a kind of bulk collection originated regularly by the beneficiary's bank to the payer's bank based on the contracts/agreements. It can be used to collect utility fees for water, electricity and gas, etc. Regular credit is a kind of bulk payment originated regularly by the payer's bank to the beneficiary's bank based on the contracts/agreements. It can be used to pay salaries, pensions, insurance premiums and treasury, etc. Contracts or agreements shall be signed between debit beneficiaries and banks and between credit payers and banks to define their respective rights and responsibilities. Interbank regular debit/credit transactions are generally processed by PBC. Part of local regular debit/credit transactions is processed by local clearing system.

### 2.2.2 Non-cash payment terminals

Terminals accepting bankcards mainly include ATMs and POS terminals.

ATMs have the functions of inquiry, funds transfer, deposit and withdrawal. Some new ATMs also have such functions as loading value for mobile phones, paying utility bills, etc.

ATMs are emplaced and maintained by commercial banks or third parties, while cash loading is done only by the commercial banks. The services provided by different commercial banks via ATMs have no difference, but differ slightly in charging.

POS terminals are mainly used in consumption. POS terminals can be emplaced by acquiring institutions or third parties. In general, POS terminals are not allowed to be used for

withdrawal. However, to improve the payment environment in rural areas, withdrawals below CNY 1,000 are allowed at chartered merchants / appointed stores.

At the end of 2010, there were 2,183,000 chartered merchants, 3,334,000 POS terminals and 271,000 ATMs, respectively.

Table 4

**Number and growth rate of chartered merchants,  
POS terminals and ATMs, 2006–10**

<b>Item</b>		<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Chartered merchants (10,000)	Growth rate ( % )	12.67	21.82	44.25	38.48	61.65
	At year-end	52.1	73.92	118.17	156.65	218.3
POS terminals (10,000)	Growth rate ( % )	21.04	36.32	66.39	56.32	92.57
	At year-end	81.8	118.12	184.51	240.83	333.4
ATMs (10,000)	Growth rate ( % )	1.57	2.52	4.45	4.74	5.61
	At year-end	9.78	12.3	16.75	21.49	27.1

Source: China Payment System Development Report.

### **2.2.3 Recent developments**

With the rapid development of IT and the internet, electronic payments, especially online payments, have developed rapidly.

Online payments include internet payments, mobile payments, telephone payments and digital TV payments through public or dedicated networks. Among them, internet payments play a dominant role.

At present, banks are the primary providers of internet payment services. They can provide the services independently or cooperate with non-financial institutions to do so. In 2010, the total number of internet payment users of commercial banks reached 246 million, and the volume and value reached 8,498 million and CNY 522.39 trillion, respectively. Interbank clearing for internet payments is mainly processed by PBC.

China's mobile payments have developed rapidly. At the end of 2010, there were 859 million mobile phone users. Mobile payments can be used for remote payments and near-field payments. The total number of mobile payment users of commercial banks reached 90 million, and the volume and value reached 118 million and CNY 570 billion, respectively.

### **2.2.4 Interchange fee regulation**

The interchange fee for international bankcards used in China shall comply with the rules of international card organisations, while the fee for domestic bankcards shall comply with relevant domestic provisions.

### 3. Interbank clearing and settlement systems

#### 3.1 General overview

PBC has developed several interbank payment systems, which include the High-Value Payment System (HVPS), the Bulk Electronic Payment System (BEPS), the Cheque Imaging System (CIS), the Internet Banking Payment System (IBPS) and the China Domestic Foreign Currency Payment System (CDFCPS). These systems are owned by PBC. HVPS, BEPS and IBPS are the three primary application systems of the China National Advanced Payment System (CNAPS). As the RTGS system in China, HVPS has been in operation nationwide since June 2005.

#### 3.2 High-Value Payment System (HVPS)

HVPS mainly handles inter-city and local credit transfers above a given value as well as urgent low-value transfers electronically. Payment instructions are sent in real time and cleared transaction by transaction.

##### 3.2.1 Institutional framework

PBC has promulgated the *Measures for Processing of HVPS Business*, *Procedures for Processing of HVPS Business*, *Measures for Administration on Automatic Pledge Financing*, *Measures for Operational Administration on China National Advanced Payment System* and *Measures for Administration on Access into and Withdrawal from Payment System of Banking Institutions* to lay down the rights, obligations and responsibilities of the parties concerned.

##### 3.2.2 Participation

Participants in HVPS are divided into direct, indirect and chartered participants.

Direct participants are the commercial banks which have RMB reserve accounts<sup>7</sup> with PBC, and are directly linked to HVPS through their internal systems. Direct participants also include city-level branches of PBC.

Indirect participants are the commercial banks which have no direct link to HVPS and entrust direct participants to submit and receive interbank payments. Indirect participants also include county-level branches of PBC.

Chartered participants are approved by PBC to have direct access to the payment system as a third party. They can handle specified payment transactions by HVPS.

At the end of 2010, there were 1,729 direct participants, 100,510 indirect participants and 6 chartered participants.

##### 3.2.3 Types of transactions

Transactions processed in HVPS are ordinary credit transfers, third-party funds transfers and local netting transactions.

Ordinary credit transfers are originated by the payer's bank and sent in real time to the National Processing Center (NPC), which transfers the funds to the payee's bank immediately after settlement.

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<sup>7</sup> With the approval of PBC.

Intermediary credit transfers are originated by the chartered participants. They send netting positions or gross positions of related trading parties to HVPS for debiting or crediting of trading parties' accounts. After settlement, HVPS notifies the third party, debtors and creditors.

Local netting transactions are net amounts to be settled that are submitted by local clearing houses through local PBC branches.

### **3.2.4 Operation of the system**

CNAPS has two tiers of processing centres, the National Processing Center (NPC) and processing centres at provincial cities, plus Shenzhen City Clearing Processing Centers (CCPCs). CCPCs are connected to NPC by dedicated communication networks. For transactions processed in HVPS, NPC receives and forwards payment transactions, and submits transactions to the clearing account management system in real time. CCPCs are responsible for forwarding and receiving payment transactions. The participants are mainly connected to CCPCs. But chartered participants, such as CCDC and SHCH, connect directly to NPC.

Bank of China (Hong Kong) and Bank of China (Macao) have joined HVPS as direct participants. They are clearing agents in Hong Kong and Macao. Payments between mainland China and Hong Kong/Macao are sent and settled by their intrabank system and HVPS.

NPC has dual hot backup at the active site and another backup system at the passive site.

HVPS operates on business days. One business day is composed of four phases: start of day, business hours, clearing window, and end of day. Business hours are from 08:30 to 17:00. The clearing window opens from 17:00 to 17:30 when necessary for short participants to raise money. End of day processing starts after the clearing window. Each phase of the day can be adjusted when necessary.

### **3.2.5 Settlement procedures**

All interbank payments are settled on reserve accounts (clearing accounts) of commercial banks in the central bank. HVPS will check the balance on the clearing account before debiting the participant. Once the transaction is settled, the payment is final. If the balance of a direct participant is insufficient, its subsequent payments will be queued. From 17:00 to 17:30, the system only handles payment instructions which will supply liquidity to short participants. At 17:30, the system continues to settle net positions which must be settled on the same business day, and returns and cancels unsettled transactions in the queue. At the end of the day, after completing the reconciliation with commercial banks, HVPS sends the statement of every clearing account to the correspondent commercial bank and downloads balances of all the clearing accounts to the Accounting Booking System (ABS).

ABS is distributed in 341 city-level PBC branches. In order to enhance processing efficiency and strengthen liquidity management, PBC has placed all the clearing accounts of the direct participants in HVPS. ABS is connected to HVPS. During the day, HVPS keeps records on all the accounts; at the end of the day, HVPS sends the account balances to ABS.

### **3.2.6 Risk management**

HVPS risks primarily include liquidity risk, credit risk, legal risk and operational risk.

HVPS provides such functions as account inquiry, balance warning, business queuing, clearing window and automatic pledge financing, which help to improve liquidity management. It also takes such measures as business limitation, account balance control and debiting control to strengthen the management of credit risk.

In order to prevent legal risk, PBC has formulated a series of regulations, rules and procedures on payment transaction processing, automatic pledge financing and operational management.

Many measures have been taken to ensure HVPS runs safely and steadily and avoids risks resulting from technical failures and manual mistakes. The measures include adoption of highly reliable networks and computers, encryption in communications and business, checks on instruction format and authority, checks on balances at the end of the day/year, and establishment of a mechanism for dealing with failure and disaster.

### **3.2.7 Pricing**

PBC charges fees to the originating participants, purely to cover operating and maintenance costs in the long run. For every payment transaction, the charge is CNY 5.5. For inquiries, return applications and other non-payment messages, the charge is CNY 1.

### **3.2.8 Major ongoing and future projects**

PBC is developing the second generation of CNAPS. This will support banking institutions in accessing the system from one entry point and adapting to their centralised business processing. It will support the PVP settlement of RMB and foreign currencies in the foreign exchange market to reduce risks. It will support message exchange and settlement of transactions in cross-border RMB payments. It will have such functions as HVPS queue matching, "cash pool" management and automatic lending to cope with liquidity risk. It will also adopt ISO 20022 to promote interoperability between different systems.

## **3.3 Bulk Electronic Payment System (BEPS)**

BEPS deals mainly with local and non-local paper-based debit payments as well as low-value credit transfers below a given value. In June 2006, BEPS was put into operation nationwide. The system sends payment instructions in bulk, nets in real time and settles at regular times.

### **3.3.1 Institutional framework**

PBC has promulgated *Measures for Processing of BEPS Business*, *Procedures for Processing of BEPS Business*, *Measures for Administration on Pledge Financing of BEPS Business* and *Measures for Operational Administration on China National Advanced Payment System* to regulate rights, obligations and responsibilities of the parties concerned.

At the end of 2010, BEPS had 1,730 direct participants, 100,510 indirect participants and 16 chartered participants.

### **3.3.2 Participation**

Participants in BEPS are divided into direct, indirect and chartered participants.

Direct participants include the commercial banks and the city-level branches of PBC which have opened clearing accounts in PBC,<sup>8</sup> and are linked directly to BEPS.

Indirect participants are the commercial banks and county-level branches of PBC which have no access to BEPS and thus entrust direct participants to submit and receive interbank payments.

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<sup>8</sup> With the approval of PBC.

Chartered participants are approved by PBC to have direct access to the payment system as a third party. At present, the chartered participants of BEPS mainly include centralised collection and payment centres.

### **3.3.3 Types of transactions**

BEPS can process seven types of basic transaction: ordinary credit, periodic credit, real-time credit, ordinary debit, direct debit, real-time debit and information service. At present, the ceiling on ordinary credit and standing order transactions handled by BEPS is CNY 50,000; there is no ceiling for other payment transactions.

### **3.3.4 Operation of the system**

BEPS and HVPS operate on the same technical platform and share the same mainframe, communication network, basic data storage and clearing accounts.

The transactions of BEPS are processed on two levels: NPC and CCPCs. NPC receives and forwards payment transactions and information, nets payment transactions across CCPCs, and regularly submits the net amounts to HVPS for settlement. CCPCs receive and forward payment transactions and information, net payment transactions covered by the same CCPC and regularly submit the net amounts to HVPS for settlement.

BEPS runs constantly for 24 hours a day and 7 days a week. The processing cycle of the system runs from 16:00 on T-1 to 16:00 on T. Funds are settled between 8:30 and 17:00 on business days of HVPS. PBC may adjust the business days and settlement days of BEPS when necessary.

### **3.3.5 Netting and settlement**

BEPS provides periodic settlement on financial institutions' accounts for the net balance of payment transactions. NPC and CCPCs conduct real-time bilateral netting of transactions within the net debit cap. They submit the netting positions to HVPS for settlement at the designated time. Once the transaction is netted, the payment is final and irrevocable.

### **3.3.6 Risk management**

BEPS risks primarily include liquidity risk, credit risk, legal risk and operational risk. In order to prevent liquidity risk, BEPS provides functions such as netting queuing, adjustment of the net debit cap and matching of queuing transactions.

To strengthen credit risk management, BEPS shares the same clearing accounts system with HVPS, and is also designed to have the central bank as the central counterparty and set a net debit cap for all direct participants. Only payments within the net debit cap can be netted. Otherwise, they will be queued. Where the net debit cap is guaranteed by collateral and earmarked funds, if a direct participant presents a credit risk and is unable to settle its net debit position, PBC can take the collateral and earmarked funds.

PBC has formulated a series of rules and procedures on payment transaction processing, collateral management and operational management.

Many measures have been taken to ensure BEPS safety and reliability and avoid risks resulting from technical failures and manual mistakes. The measures include adoption of highly reliable networks and computers, encryption of communications and business, checks on instruction format and authority, equivalence checks on balances at the end of the day/year, and establishment of a mechanism for dealing with failure and disaster.

### **3.3.7 Pricing**

PBC charges fees to the originating participants, purely to cover operating and maintenance costs. Differentiated charging rates are applied to local and inter-province payment transactions. The charge for inter-province payments is 1.5 times that for local payments. To adjust the peak volume of the system and balance the volume in different time periods, PBC also sets different rates by processing time. At present, for every payment transaction by BEPS, PBC charges from CNY 0.03 to 1.25. For non-payment messages, the rate charged differs by data flow, ranging from CNY 0.01/kb to CNY 1/kb.

### **3.3.8 Development of the new-generation payment system**

See Section 3.2.8.

## **3.4 Internet Banking Payment System (IBPS)**

IBPS mainly handles interbank retail payment transactions via the internet, enabling customers to submit online payments and obtain results in real time. IBPS has been put into operation nationwide since August 2010.

### **3.4.1 Institutional framework**

PBC has promulgated *Measures for Processing of IBPS Business*, *Procedures for Processing of IBPS Business*, and *Measures for Operational Administration on IBPS* to clarify rights, obligations and responsibilities of the parties concerned. At the end of 2010, 120 commercial banks had access to IBPS, mainly covering all the commercial banks that have launched internet banking services.

### **3.4.2 Participation**

IBPS has direct and indirect participants. Direct participants are banking institutions with direct access to the system.

Banking institutions with direct access are commercial banks which have RMB reserve accounts with PBC, and are linked directly to IBPS. Other banking institutions can entrust direct participants with the submission/receipt of payments.

### **3.4.3 Types of transactions**

IBPS mainly handles internet credit and debit transfers initiated by commercial banks.

### **3.4.4 Operation of the system**

The internet banking systems of commercial banks approved by PBC are connected directly to IBPS from one entry point.

IBPS offers service around the clock. Its operation cycle can be adjusted and is consistent with BEPS. Since the system allows participants to access IBPS via one entry point, the netting of all transactions is processed in NPC.

### **3.4.5 Settlement procedures**

IBPS shares the net debit cap with BEPS and the same clearing accounts system with HVPS. It complies with the same rules as BEPS in terms of transactions netting and funds settlement.

### **3.4.6 Risk management**

The IBPS risks primarily include liquidity risk, credit risk, legal risk and operational risk.

IBPS takes PBC as its counterparty, and controls credit risk by setting a net debit cap for direct participants. The liquidity risk management is the same as that of HVPS. PBC has formulated business processing rules and procedures to prevent legal risk. IBPS ensures the system runs safely, reliably and continuously by setting business limitation, strengthening network and data security, improving operation and maintenance, and establishing a sound disaster recovery mechanism.

### **3.4.7 Pricing**

At present, PBC does not charge fees to direct participants.

## **3.5 Local clearing systems**

Local clearing systems conduct centralised exchange and netting of local electronic payments and paper-based instruments such as cheques, promissory notes and bank drafts that cannot be truncated.

### **3.5.1 Institutional framework**

A majority of local clearing systems are owned by PBC (see Section 1.2.2) and a minority of them are jointly owned by their members (see Section 1.3.2.4). PBC or the members have formulated rules and procedures on the administration of local clearing systems and their operation to clarify the rights, obligations and responsibilities of the parties concerned.

### **3.5.2 Participation**

The participants in local clearing systems are mostly banking institutions, accounting and treasury departments of PBC branches, and other institutions approved by PBC.

### **3.5.3 Types of transactions**

Local clearing systems process debit and credit transactions. Debits mainly include cheques, promissory notes, drafts and bill collections, while credits primarily include pay-in slips, entrusted payment vouchers and tax payment (rebate) vouchers.

### **3.5.4 Operation of the system**

Local clearing systems have three processing modes: (1) traditional manual processing; (2) computerised processing, ie a banking institution carries both paper vouchers and their magnetic copy which stores relevant data, or transmits the data to the clearing house; the clearing house sorts paper vouchers, automatically calculates and prints netting results, and then gives them to the relevant participants; and (3) bill sorter mode, ie clearing houses automatically sort the vouchers, read payment data and calculate the net amount to be paid or received by each participant.

In cities with very high payment volumes, clearing houses have to exchange vouchers twice a day. In small cities and counties, clearing houses normally exchange vouchers once a day.

### **3.5.5 Settlement procedures**

Local clearing systems submit the results to the accounting department of PBC branches or designated commercial banks for funds settlement. If the net amount is posted on a clearing account, branches submit the net amount of that direct participant to HVPS for settlement.

### **3.5.6 Risk management**

Participants must have a sufficient balance on their accounts to pay their net debit positions. If a participant has insufficient funds to cover the debit position within the due period, PBC will provide overnight pledge financing. If a participant does not have enough collateral, PBC will provide high penalty interest loans. If a participant fails to make up the short position from time to time, it will be forced to quit the local clearing system.

### **3.5.7 Pricing**

Local clearing houses are non-profit-oriented institutions. Nevertheless, their participants jointly bear the operational costs. Fees are charged in three modes: 1) by transaction volumes; 2) an annual fee from each participant; or 3) both of the above.

## **3.6 Cheque Image System (CIS)**

CIS is a cheque truncation system supporting the use of cheques nationwide. It converts physical cheques into images, and then transmits the cheque image and related information to the drawer's bank. The system was launched in June 2007.

### **3.6.1 Institutional framework**

PBC has promulgated the *Processing Measures for CIS Business*, the *Processing Procedures of CIS Business*, the *Administrative Measures for Operation of CIS* and *Administrative Measures for Digital Certificates* to define the rights, obligations and responsibilities of the parties concerned. CIS is owned and operated by PBC.

### **3.6.2 Participation**

Participants include banking institutions and local clearing houses. The local clearing houses can process transactions on behalf of local banking institutions. The banking institutions can also connect to CIS directly if they perform centralised processing of internal transactions and are qualified for image capture. At the end of 2010, there were 59,548 participants.

### **3.6.3 Types of transactions**

CIS primarily processes the inter-city image information of cheques with a value of less than CNY 500,000.

### **3.6.4 Operation of the system**

CIS operates 24 hours a day, 7 days a week. It sets a processing cycle for each transaction; participants return an acknowledgment of receiving the image, and meanwhile send a return receipt of the ordinary debit to BEPS for funds clearing and settlement. At 16:00 every day, CIS marks transactions without the returned receipts within the specified period as overdue.

### **3.6.5 Settlement procedures**

At present, the clearing and settlement of truncated cheques is processed by BEPS.

### **3.6.6 Risk management**

PBC has formulated CIS transaction processing rules and procedures to prevent legal risk. In order to reduce operational risk, CIS uses digital authentication technology to ensure the security of information transmission. PBC requires that cheques above a certain amount be

exchanged with the payer's bank. Any transaction in excess of CNY 500,000 will be rejected by the system.

### **3.6.7 Pricing**

CIS does not apply any charges for the time being. Local clearing houses can charge banking institutions connected; the standards are determined by PBC branches.

## **3.7 China Domestic Foreign Currency Payment System (CDFCPS)**

CDFCPS is an RTGS system developed by PBC for the foreign currency payments incurred by domestic purchases of goods and services. It was put into operation at the end of April 2008. CDFCPS can process payments in eight currencies: USD, HKD, GBP, EUR, JPY, CAD, CHF and AUD. It does not involve foreign exchange transactions.

### **3.7.1 Institutional framework**

Rules and regulations on CDFCPS include mainly the *Administrative Measures for China Domestic Foreign Currency Payment System*, the *Rules on the Administration of Settlement Agents of China Domestic Foreign Currency Payment System*, the *Rules on Operation of China Domestic Foreign Currency Payment System*, the *Rules on Business Processing of China Domestic Foreign Currency Payment System*, and the *Emergency Management Plan of China Domestic Foreign Currency Payment System*. PBC inspects and supervises the participants, chartered participants, settlement agents and CNCC according to law.

CDFCPS consists of the foreign currency clearing system and the system of settlement agents. The clearing system is developed and owned by PBC, while the systems of settlement agents are developed and owned by themselves.

### **3.7.2 Participation**

Participants can be divided into direct participants and chartered participants. There were 31 participants at the end of 2010.

Direct participants open foreign currency accounts with the settlement agents. Chartered participants are foreign currency clearing institutions which have joined CDFCPS but have not opened accounts with settlement agents.

### **3.7.3 Types of transactions**

At present, the main type of transaction is interbank credit transfer.

### **3.7.4 Operation of the system**

CDFCPS operates in normal circumstances from 9:00 to 17:00 on business days. If a participant is short of funds at 17:00, the system will open a clearing window from 17:00 to 17:30. If there is no need to open the window, the system will switch over to next business day. PBC may adjust the business days and business hours of CDFCPS if necessary.

### **3.7.5 Settlement procedures**

CDFCPS is an RTGS system. It adopts a Y-shaped information flow structure, where CNCC receives, clears and transmits payment instructions, and settlement agents are responsible for the settlement of related foreign currency payment instructions.

Settlement agents are commercial banks approved by PBC with a term of three years.

### **3.7.6 Risk management**

CDFCPS has no credit risk but liquidity risk. Therefore, it has a queue management system, matching mechanism and clearing window. It also enables participants to inquire about their queued payment instructions and available account balance. Besides, settlement agents provide daylight financing, overnight financing and other liquidity mechanisms to participants.

Participants must be legal persons. The clearing system of CDFCPS has dual hot backups to ensure continuous processing. Encrypted algorithm and cipher codes are applied to ensure the safety of data. An emergency management plan, audit trail and virus prevention mechanisms have been applied. The internal control mechanism has been developed to prevent maloperation, operational errors and internal fraud.

### **3.7.7 Pricing**

Participants pay for the clearing and settlement service. Payment for the former is based on the principle of cost coverage, while the latter is charged according to the agreement between the participants and the settlement agents based on market-oriented principles.

## **4. Systems for post-trade processing, clearing and securities settlement**

### **4.1 General overview**

At present, China's bond market comprises the interbank bond market – an OTC market – and the exchange bond market, with the former dominating. The bond transfer mechanism has been established between the two markets. Trades from the interbank bond market are settled via CCDC and SHCH and trades from the exchange bond market are cleared and settled via SD&C.

CCDC is a nationwide non-bank financial institution, which provides services such as issuance, registration, custody, settlement, redemption and information products for the bond market.

SHCH provides clearing and settlement, together with registration and depository services for spot and derivative transactions in the interbank market. SHCH provides a centralised clearing service in RMB and foreign currencies as well as for cross-border transactions in RMB approved by PBC.

SD&C provides stock exchange markets with such services as centralised registration, custody, clearing and settlement. It delivers multilateral netting services as a central counterparty, as well as securities and funds settlement services as an operator of the securities clearing and settlement system.

### **4.2 Central counterparties and clearing systems**

#### **4.2.1 SD&C securities clearing system**

SD&C serves as central counterparty (CCP) to provide multilateral netting of transactions in securities traded on the stock exchanges.

##### **4.2.1.1 Institutional framework**

The *Securities Law*, the *Measures for the Administration of Securities Registration and Settlement (Measures)* and related business rules of SD&C form the legal framework for securities clearing. According to the *Securities Law*, SD&C is responsible for providing

centralised clearing services for transactions in securities listed on the stock exchanges and subject to the supervision and administration of CSRC. The *Measures* specify the system of “two-tiered settlement” for securities transactions and clarify the role of SD&C as CCP, emphasising the netting arrangement and DVP settlement.

The Shanghai and Shenzhen stock exchanges each hold 50% of the shares in SD&C.

#### **4.2.1.2 Participation**

Domestic securities operation institutions that have the status of a legal person may apply to be clearing and settlement participants. Participants are divided into Class-A participants and Class-B participants. Class-A participants may conduct clearing and settlement for their own trades as well as for other institutions. Class-B participants can only conduct clearing and settlement for their own trades. At the end of 2010, 106 securities companies were SD&C participants.

#### **4.2.1.3 Types of transactions**

SD&C provides clearing services for transactions in securities listed on the Shanghai and Shenzhen stock exchanges, including stocks, funds, warrants, treasury bonds, local government bonds, corporate bonds and convertible bonds.

#### **4.2.1.4 Operation of the system**

SD&C directly receives transaction information from the trading systems, and achieves straight through processing (STP) from trading to clearing by connecting its registration, clearing and settlement system with the trading systems of the Shanghai and Shenzhen stock exchanges.

SD&C receives A-share transaction data from exchanges and conducts clearing after the exchange market closes at 15:00, and then sends the clearing results to participants at the end of the trading day.

#### **4.2.1.5 Risk management**

According to the *Securities Law*, SD&C shall have necessary service facilities and sound data security protection measures, and establish business, financial and security management rules and risk management systems to ensure normal business operation.

The following measures are adopted by SD&C to prevent settlement risks. First, SD&C requires participants to pay a certain proportion of their average daily buying amount in the previous month and deposit the funds in the settlement reserve account with SD&C. Second, the trades are settled by DVP. Third, SD&C applies for a credit line from commercial banks to prevent liquidity risk. Fourth, in case any member defaults, SD&C may close out the outstanding position, sell out its collateral, suspend the purchase rights to securities of the defaulting member and impose a penalty etc, following the default management procedures. Fifth, SD&C has set up a guarantee fund for the continuity of settlement in case of a participant's default. SD&C and its participants contribute to the securities settlement risk fund required by CSRC and MOF.

#### **4.2.1.6 Links to other systems**

At present, SD&C does not connect with other clearing systems.

#### **4.2.1.7 Pricing**

SD&C does not collect fees for clearing and settlement services separately. It mainly charges related settlement fees according to a certain proportion of the number or amount of securities transferred.

When changing major fee items and standards for securities registration, clearing and settlement, SD&C is obliged to consult participants in advance. It also has to obtain the approval of the authorities.

#### *4.2.1.8 Major ongoing and future projects*

In light of the assessment of China's securities settlement system in the Financial Sector Assessment Program in 2010 and the new international standards for financial market infrastructure, SD&C intends to enhance a lot of features.<sup>9</sup>

### **4.2.2 SHCH clearing system**

The SHCH business system consists of a clearing system, together with a registration and settlement system. SHCH started to provide clearing, settlement, registration and depository services for innovative products such as CRMW and SCP in late 2010.

#### *4.2.2.1 Institutional framework*

SHCH is licensed, regulated and overseen by PBC.

#### *4.2.2.2 Participation*

Participants in the interbank market can apply for SHCH membership. They can be divided into direct and indirect clearing members. Direct clearing members need to open an account in SHCH. Indirect clearing members need to entrust direct members to fulfil settlement.

#### *4.2.2.3 Types of services*

SHCH provides a gross clearing service for investors in CRMW and SCP. Also, it is designing and developing the netting service for RMB and foreign currency spot transactions.

#### *4.2.2.4 Operation of the system*

SHCH business systems operate 09:00–17:00 every trading day in the interbank market. The clearing system receives trading data on a real-time basis, and clears the data confirmed by participants. After clearing, the clearing system generates funds and securities settlement instructions. Then the securities settlement instructions are sent to the SHCH registration and settlement system. Funds settlement instructions are handled by HVPS or the designated settlement banks.

#### *4.2.2.5 Risk management*

SHCH is formulating rules and procedures for risk management, such as clearing member qualification, monitoring credit risk of clearing members, credit limits, margin, marking to market, a clearing fund, a risk prevention reserve, and default arrangements.

#### *4.2.2.6 Links to other systems*

SHCH business systems are externally connected to the trading system of the China Foreign Exchange Trading System (CFETS) and HVPS. The clearing system is internally integrated and seamlessly connected with its registration and settlement system.

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<sup>9</sup> Measures include strengthening the management of credit and liquidity risks and arrangements for default treatment, ensuring sophisticated and scientific management of settlement risks, and guaranteeing the soundness of the settlement infrastructure.

#### 4.2.2.7 Pricing

SHCH collects clearing fees based on its charging items and standard.

### 4.3 Securities settlement systems

#### 4.3.1 CCDC Central Bond Generalized System (CBGS)

CBGS is owned and operated by CCDC, and its primary purpose is the registration, custody and settlement of bonds in the interbank bond market. The par value of bonds settled<sup>10</sup> has shown a significant growth trend and exceeded CNY 160 trillion (USD 24 trillion) in 2010. In 2010, the total value of bonds issued in CBGS reached CNY 9.51 trillion (USD 1.40 trillion).

##### 4.3.1.1 Institutional framework

CCDC provides bond registration, custody and settlement business primarily based on such laws, regulations and rules as the *Law on the People's Bank of China*, the *Administrative Measures for Bond Transactions in the National Interbank Bond Market*, the *Administrative Measures for Registration, Depository and Settlement of Bonds in the Interbank Bond Market* formulated by PBC, the *Interim Measures for the Administration of Depository of Treasury Bonds of the People's Republic of China*, the *Administrative Measures for Cross-Market Transfer Depository of Treasury Bonds* formulated by the MOF, and the *Administrative Measures for (Electronic) Savings Treasury Bonds (Trial)* jointly promulgated by the MOF and PBC. CCDC has formulated a set of rules and procedures and signed agreements with market participants. These rules and agreements also constitute an important part of the institutional framework.

##### 4.3.1.2 Participation

All settlement members of CCDC are institutional investors. Among them, domestic settlement members include commercial banks,<sup>11</sup> policy banks, credit cooperatives, securities companies, insurance companies, finance companies, trust companies, fund management companies, financial asset management companies, financial lease companies and automobile finance companies. Non-financial institutions<sup>12</sup> and non-legal-person institutional investors<sup>13</sup> are also included. Overseas settlement members are overseas central banks or monetary authorities authorised by PBC to enter China's interbank bond market, RMB business clearing banks in Hong Kong and Macao and overseas participating banks of cross-border trade settlement in RMB.

CCDC settlement members are divided into classes A, B and C. Class-A settlement members have a direct connection with the Central Bond Bookkeeping System (CBBS) of CCDC. Apart from proprietary account settlement, Class-A members may apply to open Class-C accounts with CCDC and make settlements for their customers. Class-C members can inquire about their balance at any time, and reconcile with the settlement agents (Class-A settlement members). Class-B members can only settle their proprietary transactions through a direct connection with CBBS.

Class-A membership is limited to the head offices of commercial banks that are registered in mainland China and have been qualified as settlement agents by PBC.

<sup>10</sup> The par value of bonds settled excludes the second leg of repo transactions.

<sup>11</sup> Including headquarters and authorised branches.

<sup>12</sup> Enterprises and institutions.

<sup>13</sup> Such as funds, trust products, securities asset management plans and insurance products.

Class-B membership is limited to financial institutions and non-legal-person institutional investors registered in mainland China.

Class-C membership is limited to non-financial institutions with legal person status and non-legal-person investors registered in mainland China.

Among the three classes of overseas institutions eligible to trade in the interbank bond market, overseas central banks or monetary authorities and RMB business clearing banks in Hong Kong and Macao may apply for Class-B or Class-C membership. Overseas banks participating in cross-border trade settlement in RMB may apply for Class-C membership.

#### 4.3.1.3 Types of transactions

CBGS can process several types of bond transactions, such as: cash transactions, bond forwards, pledged repos, outright repos, bond lending, and pledged financing for HVPS and BEPS participants, Treasury cash management, open market operation transactions, etc.

#### 4.3.1.4 Operation of the system

##### Settlement confirmation

If two members negotiate a transaction through the trading system of CFETS, trade data will be sent in real time from the trading system to CBGS. Upon receiving the trade data, CBGS will check its validity and send settlement instructions to both parties for confirmation. The transaction can be settled only after confirmation.

If two members negotiate a transaction by themselves, one party inputs settlement instruction into CBGS. Upon receiving the instruction, CBGS will send it to the other party for confirmation, after which the transaction can be settled.

##### STP capability

Through its connection with the CFETS system, CCDC can use STP from transactions to settlements, which helps to control settlement risk and improve settlement efficiency.

##### Settlement cycle and system operation time

The bond settlements between interbank bond market participants are settled on a trade for trade basis in real time on predetermined dates. The settlement cycle can be T+0 or T+1. Bond settlement among participants of the interbank bond market is completed via CBGS from 9:00 to 17:00 every business day. It should be noted that the system's operation time is related to that of HVPS.

#### 4.3.1.5 Cash-leg settlement process

There are four settlement modes in CBGS: *Free of payment* (FOP), *Payment after delivery* (PAD), *Delivery after payment* (DAP) and *Delivery versus payment* (DVP). DVP is the main settlement mode in the interbank bond market. At present, it can be achieved by the following approaches.

One option is via direct link between CBGS and HVPS, which is applicable to the commercial banks with clearing accounts in HVPS. CCDC will act as third party to send a transfer message to HVPS for cash-leg settlement and meanwhile completes the transfer of bonds.

The other option to achieve DVP settlement is via the CCDC funds account system. CCDC holds a chartered account in HVPS and opens fund settlement accounts for non-banking institutions under the chartered account in HVPS. This approach is applicable to non-banking institutions without clearing accounts in HVPS. The bond buyer transfers its funds to the

chartered account. If the bond seller has sufficient bonds, CCDC will transfer the funds to the seller via HVPS, concurrently completing the transfer of bonds.

#### *4.3.1.6 Custody function*

CCDC handles bond registration and custody in accordance with regulations related to bond issuance and transaction. It takes care of settlement and transfer, custodian transfer, negotiated transfer and non-trade transfer of bonds. It maintains bond accounts according to the entrustment of bond holders. In addition, it handles bond redemption and payment of interest and commission.

#### *4.3.1.7 Risk management*

To reduce legal risks, a series of regulations, rules and agreements has been formulated. Based on the central depository system, dematerialisation has been achieved to mitigate custody risks. After matching and confirmation of transaction orders, settlements will be completed on a trade-for-trade, real-time basis through CBBS, which can prevent operational mistakes. Moreover, the internal audit can reduce operational risk and moral hazard effectively.

Liquidity risk has been reduced through the connection with HVPS and by providing pledged financing mechanisms for members. DVP settlement reduces credit risk and eliminates principal risk. Collateral management helps reduce replacement risk.

The system uses a two-way authentication mechanism and operation authorisation to ensure the uniqueness of settlement members. It also implements encrypted algorithm and cipher codes to maintain the integrity of transaction data. The emergency settlement mechanism can ensure business continuity under circumstances of system malfunctioning. In order to improve the reliability of hardware, the system has adopted dual hot backups on the mainframe and redundant backup on telecommunication devices. A disaster recovery mechanism and an inter-city disaster recovery centre have been developed.

#### *4.3.1.8 Links to other systems*

CCDC signed a bond settlement agreement with HKMA in 2004. The cooperation includes a one-way connection with the Central Moneymarkets Unit (CMU) of HKMA and provides an alternative cross-border settlement channel for domestic financial institutions that are qualified to participate in bond investment in Hong Kong.

CCDC also signed a cross-border settlement agreement with Clearstream Bank in 2007 to provide an alternative settlement channel for domestic qualified financial institutions to participate in bond investment on the international market.

#### *4.3.1.9 Commercial bank counter market business system*

The commercial banks counter market business system is a subsystem of CBGS, serving the commercial bank counter market with treasury bonds as the main product. The treasury bond is an important investment instrument for small and medium-sized enterprises and individuals. At the end of 2010, there were 8.95 million accounts in the commercial bank counter market, covering 80,000 business outlets of 40 commercial banks.

#### *Trading*

Qualified commercial banks can sell bonds through their counters, and submit bid/ask prices on each business day for individuals and entities. Investors can conduct subscription, buying and selling, repo and other transactions through the bank's network.

Qualified banks must submit quotation data to CCDC on a daily basis, and release the information on [www.chinabond.com.cn](http://www.chinabond.com.cn).

### *Custody*

The commercial bank counter market operates a two-tier custody system, in which CCDC is the first-tier custodian and opens general agency accounts for qualified banks. Qualified banks act as the second-tier custodians and can directly open custody accounts for investors. CCDC reconciles the agent accounts with second-tier custody accounts. It provides voice inquiry services to investors for balance checking. Investors can also inquire about their accounts through the qualified banks.

### *Settlement*

Treasury bond transactions are settled through qualified banks in real time. At the end of a trade day, the banks sum up the data and transmit it to the commercial bank counter market business system. The system reconciles the data and calculates the net trading amount of each bank. The bank sends settlement instructions to CBGS after confirmation, and CBGS transfers bonds between the bank's agency account and proprietary account.

## **4.3.2 SHCH registration and settlement system**

SHCH provides participants in the interbank bond market with registration and settlement services for CRMW and SCP subject to the regulation of PBC.

### *4.3.2.1 Institutional framework*

See Section 4.2.2.1.

### *4.3.2.2 Participation*

See Section 4.2.2.2.

### *4.3.2.3 Types of services*

The system can provide a full range of registration and depository services for fixed income products, money market instruments and standardised financial derivatives, including registration, underwriting, distribution, interest payment and pledging. The main settlement method is DVP, complemented by PAD, DAP and FOP.

### *4.3.2.4 Operation of the system*

The system conducts product settlement and transfers based on the settlement instructions sent by its clearing system and completes its fund transfers via HVPS.

### *4.3.2.5 Risk management*

SHCH prevents operational risks through rules and technology. In terms of systems, it has formulated business rules, an operation guide, internal operation rules and emergency systems. It organises business publicity activities and trainings on a regular basis. In terms of technology, SHCH has introduced such measures as monitoring business system operation and dual backup of data.

### *4.3.2.6 Links to other systems*

See Section 4.2.2.6.

### *4.3.2.7 Pricing*

SHCH collects registration and settlement fees based on its charging schedule and standards.

### **4.3.3 SD&C securities settlement system**

SD&C provides centralised securities depository and settlement services in stock markets.

#### *4.3.3.1 Institutional framework*

See Section 4.2.1.1.

#### *4.3.3.2 Participation*

See Section 4.2.1.2.

#### *4.3.3.3 Types of transactions*

The securities settlement system of SD&C provides settlement services for transactions in securities listed on the Shanghai and Shenzhen stock exchanges, concerning stocks, funds, warrants, treasury bonds, local government bonds, corporate bonds and convertible bonds, etc.

#### *4.3.3.4 Operation of the system*

The settlement cycle of A shares, funds, bonds and warrants is T+1, and that of B shares is T+3.

The settlement of securities and funds takes place on the principle of DVP and “two-tiered settlement”. SD&C is responsible for the centralised settlement of securities and funds with participants. Participants are responsible for the settlement of funds with their customers, while the securities settlement between participants and their customers is entrusted to SD&C.

#### *4.3.3.5 Cash-leg settlement process*

The funds settlement between SD&C and participants uses commercial bank money, and is handled by the 19 commercial banks as qualified settlement banks. The funds settlement involving A shares and B shares of domestic participants is completed through their settlement reserve accounts with SD&C; the funds settlement involving B shares of overseas participants is completed through their accounts with correspondent settlement banks.

With regard to A shares, SD&C calculates the net amount of each participant on day T, and notifies net debtor participants. Net debtors must deposit enough funds in their settlement reserve accounts before 16:00 on T+1. At 16:00 on T+1, SD&C transfers the funds to the settlement reserve accounts of net creditor participants. The funds settlement between participants and their customers is handled by participants themselves.

With regard to B shares, SD&C notifies participants of their net amount on T+1 for confirmation. On T+3, for domestic participants, SD&C completes funds transfer through the settlement reserve accounts of participants. For overseas participants, net debtor participants first remit the payable funds to the SD&C's accounts with settlement banks, and then SD&C notifies settlement banks to remit the funds to the net creditors' accounts.

#### *4.3.3.6 Custody function*

SD&C is a central securities depository. It can open securities accounts for investors either directly or entrust securities companies.

As a registry, SD&C maintains the register of stockholders and provides corporate action services for issuers. The stock market operates a direct holding model, that is, most stocks are registered under the name of beneficial owners. However, nominees are also allowed according to pertinent laws and regulations.

#### 4.3.3.7 Risk management

In terms of securities settlement, the stock market operates a direct holding model. Based on the shareholding information, the trading system applies such arrangements as front-end restriction on short-selling, that is, technically ensuring the investor has enough securities when he sells out the securities, furthermore ensuring the securities company will not fail to complete securities settlement.

In respect of funds settlement, an investor who submits a buying order to a securities company must have trading margin deposited in full with the company. In order to prevent misappropriation of customers' funds by securities companies, customers' trading margin kept by securities companies must be deposited in commercial banks. The practice was launched in 2006 and is referred to as third-party custody of customers' trading funds. The margin is only allowed to be used for funds settlement. The commercial bank updates customer details and margin balances on a daily basis, and provides them to investors upon inquiry.

SD&C has established business continuity arrangements and an internal control mechanism to reduce operational risks.

#### 4.3.3.8 Pricing

See Section 4.2.1.7.

#### 4.3.3.9 Major ongoing and future projects

See Section 4.2.1.8.

### 4.4 Use of securities infrastructure by the central bank

PBC provides liquidity through the securities infrastructure to primary traders in the financial market and direct participants of HVPS and BEPS.

PBC, as collateral taker, mainly engages in reverse repos, whereby a primary trader provides eligible collateral such as treasury bonds, financial bonds and central bank bills to PBC for funding. PBC also provides a credit facility via an automatic pledge financing system to direct participants of HVPS and BEPS. The direct participants can finance themselves against eligible bonds under the custody of CCDC, such as treasury bonds, and policy financial bonds issued by such institutions as governments, PBC and policy banks.

In the automatic pledge financing system, PBC can set the parameters such as the floor of par value of pledged bonds, the cap of pledge financing for direct participants of HVPS and BEPS, the minimum amount of single financing, the threshold for triggering pledge financing, the total amount of pledge financing for all participants, the bond pledged rate, the interest-free proportion and the repayment schedule.