

People's Republic of China: Detailed Assessment Report: CPSS Core Principles for Systemically Important Payment Systems

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CPSS CORE PRINCIPLES FOR SYSTEMICALLY IMPORTANT
PAYMENT SYSTEMS

DETAILED ASSESSMENT OF OBSERVANCE

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GLOSSARY

ACH	Automated Clearinghouse
ATM	Automated Teller Machine
BEPS	Bulk Electronic Payment System
BIS	Bank for International Settlements
BOB	Bank of Beijing
BOC	Bank of China
BOEA	Bank of East Asia
CCB	China Construction Bank
CCDC	China Central Depository & Clearing Co., Ltd.
CDB	China Development Bank
CIS	Cheque Imaging System
CCP	Central Counterparty
CFETC	China Foreign Exchange Trade Center
CFETS	China Foreign Exchange Trade System
CNCC	China National Clearing Center
CNAPS	China National Advanced Payment System
CNPS	China National Payments System
CPs	Core Principles
CPSS	Committee for Payment and Settlement Systems
CPSIPS	Core Principles for Systemically Important Payment Systems
CSRC	China Securities Regulatory Commission
CUP	China Union Pay
CY	Chinese Yuan
FCCPC	Foreign Currency Clearing Processing Center
FCPS	China Domestic Foreign Currency Payment System
FSAP	Financial Sector Assessment Program
FX	Foreign Exchange
G-8	Group of Eight
G-20	Group of Twenty
GDP	Gross Domestic Product
HVPS	High Value Payment System
ICBC	Industrial Commercial Bank of China
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
LCP	Local Processing Centers
MBFEs	Member Bank Front Ends
MOF	Ministry of Finance
MoU	Memorandum of Understanding
NBFI	Nonbank Financial Institution

NPC	National Processing Center
OTC	Over-the-Counter
PBC	People's Bank of China
PMIS	Payment Management Information System
POS	Point of Sale
PRC	People's Republic of China
RCCP	Recommendations for Central Counterparties
RSSS	Recommendations for Securities Settlement Systems
RTGS	Real-Time Gross Settlement
SAFE	State Administration of Foreign Exchange
SC	State Council
SD&C	China Securities and Clearing Corporation Limited
SSS	Securities Settlement Systems
WB	World Bank

EXECUTIVE SUMMARY

1. **In recent years, the People's Bank of China (PBC) has carried out a major and comprehensive reform of the China National Payments System (CNPS).** The PBC implemented the China National Advanced Payment System (CNAPS), which consists of the High-Value Payment System (HVPS) and the Bulk Electronic Payment System (BEPS). The HVPS system currently operates in a tiered way (multi-entry point) with a national processing center (NPC) and 32 local processing centers (LCPs). The HVPS system is interconnected to many trading, payments, and securities settlement systems (SSS) to allow for central bank money settlement. In addition, there are numerous cheque clearing houses around the country administered by the PBC local offices or delegated to banks. China Union Pay (CUP) handles the clearance of cards transactions whose balances are settled in the HVPS. Also automated clearinghouses (ACHs) and other systems handle clearance and settlement for a variety of payment instruments.

2. **The HVPS is a systemically important payment system, as it is the backbone of the national payments system in China.** The HVPS handled transactions for a value of CY 804 trillion in 2009, approximately 24 times the GDP value. Thus, the HVPS is being assessed against the ten Core Principles for Systemically Important Payment Systems (CPSIPS) of the Committee for Payment and Settlement Systems (CPSS) and the four responsibilities of the central banks in applying the CPSIPS. The BEPS is not currently a systemically important payment system. However, its importance for an efficient settlement of the interbank payment system is growing.

3. **The cheque clearinghouses around the country also handle an important value of transactions.** The gross value of cheques issued in 2009 reached a value of CY 248 trillion in 2009, about 7.4 times the GDP. However, of this amount, 350 million cheques are interbank cheques valued at about CY 62.5 trillion. This means that the majority of the cheques issued in the country are "on us" cheques. Also, ACHs handled CY 69 trillion in 2009, about two times the GDP, relatively important (though not major) for a big country like China. Thus, neither the cheque clearinghouses nor the ACHs have been considered systemically important in this assessment but their relative importance has been taken into consideration in the assessment of Responsibility B and C.

4. **Domestic foreign exchange (FX) transactions are mostly executed at the China Foreign Exchange Trade Center (CFETC).** The majority of participants settle their transactions bilaterally while 21 participants use a net clearing model and the CFETC acts as central counterparty (CCP). Settlement of the CY leg occurs through the HVPS and settlement of the foreign currency leg with domestic settlement banks, at which participants hold FX accounts. The mission was not provided with complete data of the transactions cleared and settled through the multilateral arrangement nor has the PBC conducted an assessment of this payment system. However, in light of the nature of these transactions and the potential systemic importance of the

system, the PBC is urged to assess the compliance of this system with international standards as soon as possible.

5. **The China Domestic Foreign Currency Payment System (FCPS) was launched in April 2008 to handle the clearing and settlement of domestic foreign currency denominated transactions.** The FCPS is a Real-Time Gross Settlement (RTGS) system and currently handles payment transactions in seven foreign currencies. The values settled in the system do not show a systemic importance of the system. Nonetheless, the PBC conducted a self assessment of the system whose main conclusions are reported in Appendix I.

6. **The assessment of the HVPS against the CPSIPS concludes that the system observes (observed or broadly observed) all the Core Principles (CPs) except CP I (legal basis).** However, there are improvement opportunities in several areas:

- **Legal foundation:** complete the legal and regulatory framework through: (i) enactment of a payment system law to give full protection to settlement finality and netting arrangements; (ii) interpretation of the “Enterprise Bankruptcy Law” to avoid a “zero-hour rule”; (iii) upgrade of payment systems rules and procedures to the level of PBC regulation.
- **Understanding and management of risks:** in addition to clarify with participants the potential legal risk associated with settlement finality, it will be important to further monitor credit and liquidity risk through: (i) more comprehensive queuing and accounting monitoring functions; (ii) application of more active mark-to-market mechanisms; and (iii) as liquidity conditions evolve, maintain flexibility in the conditions applied for intraday collateralized credit and consider the removal of charging.
- **Security, operational reliability and contingency arrangements:** implement as soon as possible the second-generation payment system that will further: (i) improve the real-time operation monitoring function; (ii) improve the risk warning capability, effectively analyzing the potential risks of the system and giving timely warning; (ii) realize automatic handling of system failures to the maximum degree; and (iv) reduce the system maintenance work load, increasing the operation monitoring efficiency and upgrading the operation maintenance level.
- **Efficiency and practicality of the system:** notwithstanding the important progress achieved since the launch of the CNAPS, it will be important to increase efficiency and practicality to the users through: (i) a “single access point” feature of the system; (ii) ensuring high value electronic transactions are not perceived as relatively more expensive vis-à-vis large value cheque transactions; and (iii) considering extending operating hours reflecting the growing importance of the system.

- **Governance of the Payments System:** the PBC is already addressing most of the existing shortfalls of the system and should be commended for the extraordinary effort to launch and operate a sophisticated and reliable payment system, which constitutes the backbone of China's financial system. Going forward, it will be important to involve more and more system participants in the "second generation" project and, eventually creating a formal users' group that could facilitate cooperation and foster the systems' performance over time. Also, it is advisable to conduct regular rehearsal of crisis procedures for all types of emergency occurrences and not just for operational matters. Over time, the PBC should strive to achieve full observance of the other CPs.

7. **The assessment of the Central Bank Responsibilities in applying the CPs concludes that PBC broadly observes all of them but there are improvement opportunities in several areas.** The main ones are:

- The PBC should clarify in detail its policy stance in payment system oversight in a publicly available document, which would expand on the scope of its actions and its plans to achieve its public policy objectives in payment system matters.
- The oversight policy document should also cover in detail the PBC major policies and instruments. Major policies would touch upon the main aspects of payment systems including, risk control, access, governance, transparency, pricing, system reliability and business continuity, efficiency, etc. Instruments would range from moral suasion to on-site inspections, from regulation to cooperation, from sanctions to the direct provision of payment services.
- The oversight document should elaborate on the criteria used to determine when a system is systemically important. A list of these systems should be provided and constantly monitored and updated.
- Also, the policy document should elaborate on institutional arrangements and cooperation in the payment system arena.
- The mission team considers that a more proactive oversight by the PBC over the China Foreign Exchange Trade System (CFETS) and the ACHs might be advisable. In particular, an assessment of the safety and efficiency of these systems with relevant international standards is recommended.
- The PBC should consider a further refinement of its cooperative framework at the domestic level, by activating and implementing Memorandum of Understanding (MoU) on payment and settlement issues and a structured oversight working framework with all relevant authorities and creating the China National Payment and Clearing Association.

- Finally, at the international level, the PBC is encouraged to continue its commendable effort of cooperation with relevant central banks and international organizations. A thorough application of the CPSS cross-border cooperative framework is also recommended.

8. **Regarding the use of payment instruments, China is evolving to a more intensive use of non-cash payment instruments, especially cards.** The relationship of cash (M0) to GDP has been declining since the beginning of the 2000 from a level of 16.7 percent of GDP in 2001 to 11.4 percent in 2009. Cards issuance has been increasing at a high pace and approximately 1.8 billion cards had been issued at end 2009, of which 1.65 billion were debit cards. The mission has not conducted a detailed assessment of retail payment systems as it was outside the context of this mission but it may be advisable for the PBC to formally include retail payments as an element of its oversight scope. In particular:

- The PBC might want to clarify that its oversight extends beyond the two traditional main objectives of efficiency and reliability of payment systems to a wider set of issues including the promotion of competition in the payment services market and the protection of consumer interests. With regard to the scope of its oversight role, the oversight policy document may explicitly state the PBC decision to apply its powers over all payments and SSS in the country including retail payment systems and services, since the latter are especially important in supporting economic activity, broad access to payment services and the public trust in money.

9. **China receives the biggest inflows of remittances worldwide after India.** The World Bank (WB) estimates that US\$47,553 million was sent to China in 2009, representing 1.1 percent of China's GDP. Notwithstanding the relevance of the inflows, it is very expensive to send money to China. According to the WB Remittance Prices Worldwide database, the average total cost of sending US\$200 to China from selected sending countries was 12.55 percent. Even though this value has decreased over the last two years, China is still among the 20 most expensive receiving countries globally. In order to reduce the cost of remittances:

- It is suggested that Chinese authorities implement the CPSS-WB General Principles for International Remittance Services and proactively embrace the G-8 and G-20 Global Objective of reducing remittance costs by 5 percentage points in five years.

I. GENERAL

10. **The present document is the assessment of the systemically important payment systems in the People’s Republic of China (PRC) based on the CPSS CPSIPS.** The document also contains an analysis of some developmental issues related to the reform of the payments system as a whole. The assessment was conducted in the context of the first field mission of the Financial Sector Assessment Program (FSAP) to the PRC (June 2010).

11. **The assessors of the CPSIPS were Massimo Cirasino and Mario Guadamillas.**¹ An assessment of the CPSS-IOSCO Recommendations for SSS and CCP was conducted by the same assessors on a follow-up FSAP mission in September 2010. During the September mission, the assessors were able to discuss as well some matters relevant to the CPSIPS assessment.

II. INFORMATION AND METHODOLOGY USED FOR ASSESSMENT

12. **The information used included all relevant laws, rules and procedures governing the systems, the abundant material available on the issue inside and outside the central bank.**² In addition, extensive discussions were held with regulators—PBC, Ministry of Finance (MOF), China Securities Regulatory Commission (CSRC), China Banking Regulatory Commission (CBRC), and State Administration of Foreign Exchange (SAFE); several stakeholders in the Chinese Payments System, including the big four commercial banks, joint stock commercial banks, city commercial banks, policy banks, foreign banks, and rural banks,³ funds management companies, the card operator (China Union Pay), the CFETC and securities depositories—China Central Depository & Clearing Co., Ltd. (CCDC) and China Securities and Clearing Corporation Limited (SD&C). A self assessment by the PBC of the country’s SIPS with the CPSS Core Principles as well as of the central bank’s responsibilities in applying the CPs was provided prior to the mission. The self-assessment was prepared by the PBC Payment and Settlement Department, in close consultation with the major stakeholders of the CNPS.

13. **In addition to the 2001 CPSS-CPSIPS Report, the methodology used follows the Guidance Note for Assessing Observance of CPSIPS prepared by the IMF and the WB in collaboration with the CPSS in August 2001.** For SSS, the 2001 CPSS-IOSCO Report on

¹ Massimo Cirasino is Head of the Payment Systems Development Group of the Financial and Private Sector Development Vice Presidency (FPD) at the World Bank. Mario Guadamillas is the FSAP Manager in FPD at the World Bank.

² The China Payment System Development Reports, 2007, 2008, and 2009, prepared by the PBOC Payment and Settlement Department were particularly relevant.

³ Bank of China (BoC), Industrial Commercial Bank of China (ICBC), China Construction Bank (CCB), Agricultural Bank of China (ABC), Bank of Beijing (BOB), China Development Bank (CDB), Bank of Communication, Shanghai Pudong Development Bank, Standard Chartered Bank, HSBC, Bank of East Asia (BOEA), JP Morgan-Chase, and Shandong United Rural Cooperative.

Recommendations for Securities Settlement Systems (RSSS), the 2002 CPSS-IOSCO Assessment Methodology for the RSSS and the 2004 CPSS-IOSCO Report on Recommendations for Central Counterparties (RCCP) were the references used.

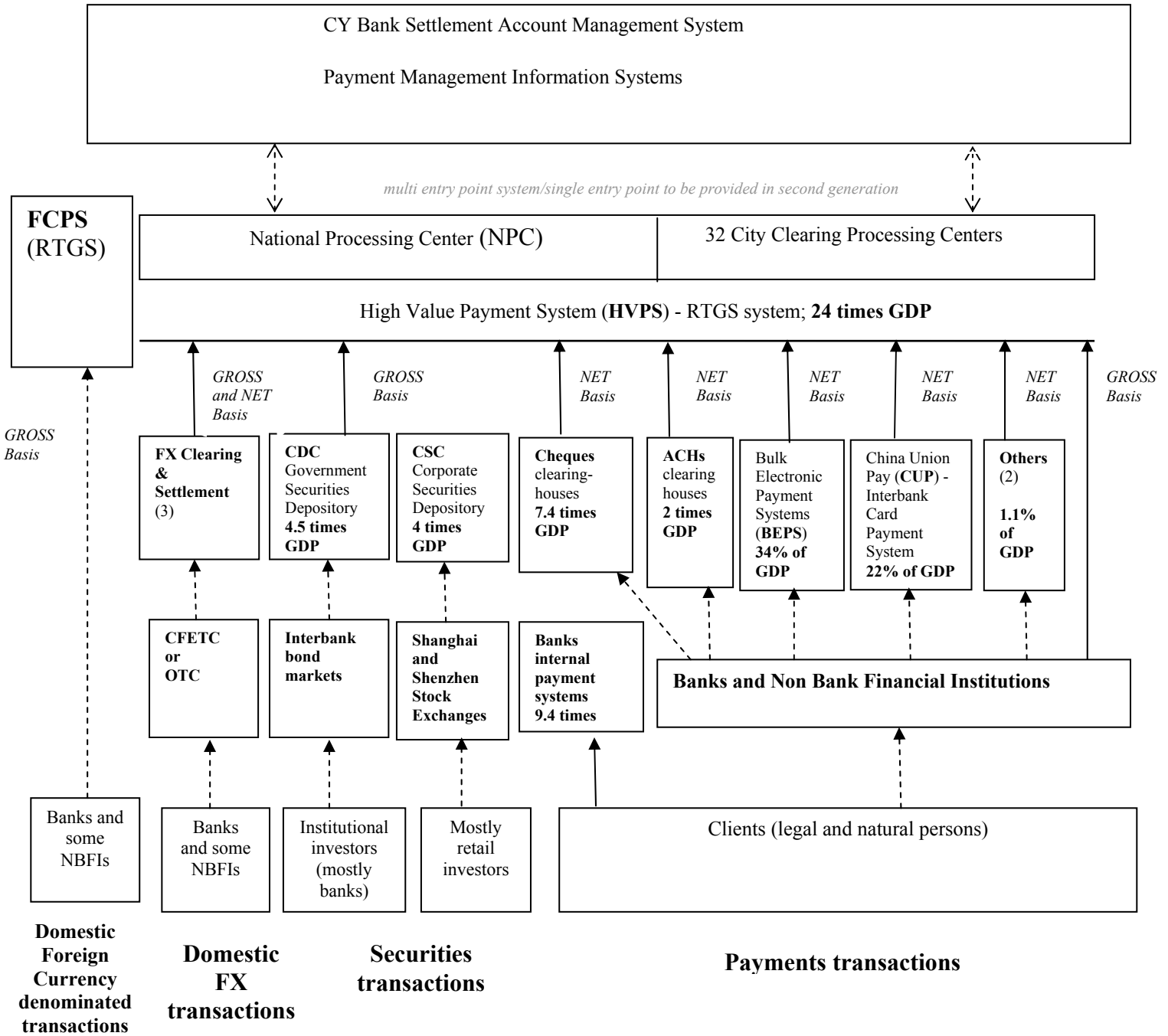
III. PAYMENT SYSTEMS INFRASTRUCTURE OVERVIEW

14. **In recent years, the PBC has carried out a major and comprehensive reform of the CNPS.** The PBC implemented the CNAPS, which consists of the High-Value Payment System (HVPS) and the BEPS. **The HVPS is the backbone of the CNPS and is a RTGS system, mainly used for large value transfers.** It is used to provide fast, efficient, secure, and reliable settlement services to banking institutions, private and public entities and financial markets. Currently, the system has more than 1,600 direct participants. In 2009, the HVPS processed 247 million transactions amounting to CY 760 trillion. The complex architecture of the National Payment System in China is depicted in Figure 1.

15. **The HVPS registered an impressive growth over the last few years, especially when compared to other systems of major economies (see Figure 2).** For example, the number of transactions processed through the system increased of 24.5 percent from 2007 to 2008. The growth of the total value processed was even higher (38.9 percent). However, as shown in Table 1, the value processed by the HVPS is still relatively low when compared to China's GDP, suggesting significant margins for further growth.

16. **Domestic payments are handled through a very diverse variety of payment systems, mainly operated by the PBC, except for cards and some local clearing houses.** The payments system backbone is the High Value Payments System (HVPS) launched by the PBC in 2005. The HVPS system currently operates in a decentralized way (multi-entry point) with a NPC and LCPs in each of the 32 provinces, autonomous regions and cities having province-level status. The HVPS system is interconnected to many trading, payments and SSS to allow for central bank money settlement. Embedded into the HVPS the PBC runs a payments systems for retail transactions (defined as <CY 50,000 as of April 2010, an increase from the previous value of <CY 20,000), the BEPS. In addition, there are numerous cheque clearing houses around the country administered by the PBC local offices or delegated to banks when the locality has not a PBC branch. CUP handles the clearance of cards transactions whose balances are settled in the HVPS. Also ACHs and other systems handle clearance and settlement for a variety of payment instruments. Figures for selected payment systems in China are presented in Table 2.

Figure 1. China National payments System



Source PBOC : China Payment System Development Report 2009.

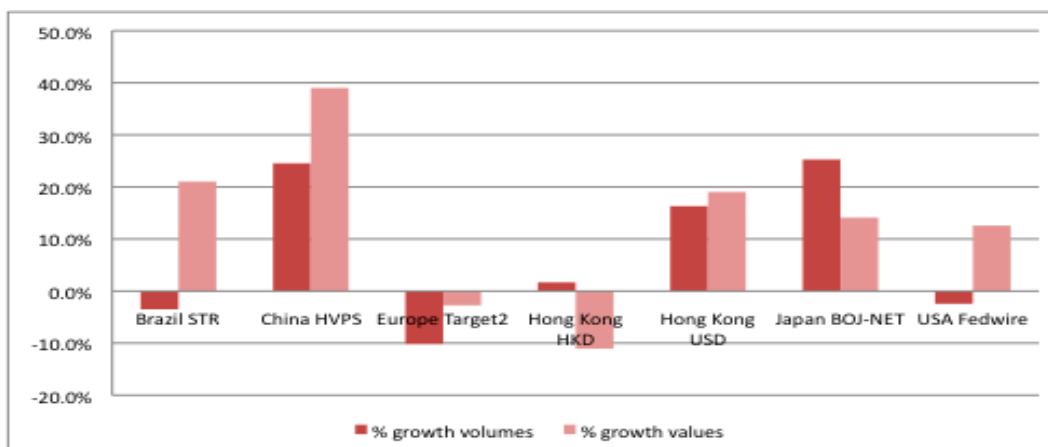
(1) Settlement figures correspond to 2009.

(2) Includes cheques image system, bank draft processing for city commercial banks, payment clearing system for rural cooperatives and banks.

----- Transaction or information related flow.

———— Settlement related flow.

Figure 2. Percentage Growth of Value and Volumes in Selected Large Value Transfer Systems from 2007 to 2008



Source: central banks for systems volumes and values; Federal Reserve Bank of New York for exchange rates; The WB for GDPs.

Table 1. Statistics for Selected Large Value Transfer Systems in 2008

System	Volumes in thousands	Values in US\$ billion	Turnover of GDP 2008
Brazil STR	10,241	47,939	29.73
China HVPS	214,060	92,117	21.29
Europe Target2	89,030	899,843	66.33
Hong Kong HKD	5,591	24,709	114.73
Hong Kong US\$	2,467	19,757	91.74
Japan BOJ-NET	8,471	285,737	58.20
USA Fedwire	131,400	754,975	53.15

Source: central banks for systems volumes and values; Federal Reserve Bank of New York for exchange rates; The WB for GDPs.

Table 2. Payments Systems in China (Volume and Value, 2008 and 2009)

Payment Systems	Operator	2008			2009		
		Volume (million)	Value (trillion)	Value/GDP	Volume (million)	Value (trillion)	Value/GDP
HVPS	PBC	214	640	21	248	804	24
BEPS	PBC	141	5.1	0.17	226	11.4	0.34
ACHs	Banks	428	71	2.36	430	69	2.06
Cards	CUP and banks	16,670	127.16	4.17	6900	165.99	4.95
Others ¹	Banks	17	0.5	0.016	23	0.4	0.011
Cheques²	PBC / delegated	860	234	7.7	854	248	7.4

Source: PBC China Payment System Development Reports 2008 and 2009.

¹ Includes cheques image system, bank draft processing for city commercial banks, payment clearing system for rural cooperatives and banks.

² Total volume and value of cheques issued.

17. **A Cheque Imaging System (CIS) is available nation-wide.** The CIS system enables electronic exchange of cheque images, automated clearing of the exchange “paper” instruments and multi-lateral net settlement of the exchange instruments at the HVPS. In 2007, over 57,000 banking institutions had commenced offering cheque imaging services, exchanging over 1.87 billion instruments amounting to CY 76.95 billion. Institutions that do not have direct access to the CIS can use bureau services offered by many of the local clearing houses and also the PBC. The PBC has also encouraged and facilitated rural financial institutions to access the CIS using bureau services offered by many commercial banks, and thereby many rural financial institutions have indirect access to the CIS. Given that there are currently 1,239 local clearing houses operating in China to handle local cheque clearing and settlement, the CIS is primarily used to clear and settle cross-region cheques. Since CIS started operations, it has been handling a steady increase of volume of transactions; in 2009, it cleared 6.93 million cheques for a value of CY 288.3 billion or on a daily average basis, 19,900 cheques for a value of CY 826 million. The ever-increasing business volume is indicative of the gradual integration of cross-region cheques into CIS.

18. **CUP provides the transmission of transaction authorization order, clearing infrastructure, sets rules, takes part in pricing including inter-change fees, and acts as the counter-party for all transactions in the settlement cycle in China.** The member banks issue cards, under-write merchants, deploy and operate point of sale (POS) and ATM terminals. The member banks internal payment card issuing and acquiring systems are connected to the CUP system. CUP can also act as an acquirer, and it does this in locations where it determines that the merchant and ATM network is inadequate.

19. **CUP transactions are settled on a multi-lateral net settlement basis in the HVPS on a T+1 schedule.** CUP maintains a settlement account at the PBC, Shanghai branch. The CUP participating member banks either have settlement accounts with the PBC directly or use correspondent banking services of a bank which has a settlement account at the PBC. Every day, at the close of clearing cycle, CUP submits a multilateral net settlement file to the HVPS, for settling transactions cleared since the last clearing cycle. **CUP provides settlement guarantee for all the transactions cleared through its system, and for this it operates a settlement reserve fund, which is funded by volume and value linked contributions from participating members.**

20. **CUP has evolved into an international payment brand.** CUP has been expanding its payment card brand to other countries. CUP has licensed its brand to banks in foreign countries and also has entered into arrangement with foreign banks on accepting CUP branded cards in their POS and ATM terminals. CUP has entered into a global tie-up with Citibank for acceptance of CUP cards at Citibank operated ATMs and POS terminals world-wide; additionally CUP has tied-up with MEPS and NETS, a payment card switches in Malaysia and Singapore respectively for acceptance of CUP branded cards at all the ATM and POS terminals of their members.

Additionally, CUP is in discussions with some banks in foreign countries to issue CUP branded cards.

21. **Real-time remittances, bills and cheque clearing services are widely available to the financial institutions serving the rural areas.** These institutions include rural commercial banks, credit unions, rural co-operative banks; collectively these institutions have 85,000 service outlets. Thirty-one of these institutions jointly established an automated clearing house called “Rural Credit Banks Funds Clearing Center.” This clearing house provides bills and cheques clearing and online real-time remittance services to rural financial institutions and commercial banks operating in rural areas. Many rural financial institutions have automated their internal systems and also their service outlets, and are able to offer these services to the rural population from their service outlets. As of 2007, bills and cheques collection services were available in all service outlets, online-remittances at outlets in 19 provinces and draft issuance in 16 provinces. In total this clearing house handled around 3 million transactions amounting to CY 72 billion, of these there were 72,000 real-time remittances transactions.

22. **Twenty one percent of rural financial services outlets are connected to the HVPS and BEPS systems.** The PBC has actively strived to provide the rural financial institutions with access to the HVPS and BEPS. The PBC has facilitated the creation of a new type of institution—Village/Township banks, which are allowed direct access to these systems. PBC has also encouraged indirect access for institutions ineligible for direct access, by facilitating identification of commercial banks which can provide indirect access and where even that is not possible, PBC provides correspondent banking services to those institutions. All these efforts have enabled around 16,248 (as of end 2007) service outlets in the rural areas to have access to the HVPS and BEPS, representing 21percent of all the rural financial services outlets.

23. **The FCPS, launched in April 2008, handles the clearing and settlement of domestic foreign currency denominated transactions.** The FCPS is a RTGS system built by the PBC to clear and settle foreign currency denominated transactions arising out of domestic trades of goods and services. The FCPS currently handles payment transactions in Hong Kong Dollar, U.S. Dollar, Euro, Canadian Dollar, Australian Dollar, Sterling Pound, Japanese Yen and Swiss Franc (no CY transaction is accepted). The FCPS is operated and maintained by the China National Clearing Center (CNCC), with Industrial and Commercial Bank of China, Bank of China (BOC), China Construction Bank (CCB), and Shanghai Pudong Development Bank designated as its Proxy Settlement Banks (PSBs). Table 3 presents the number and value of transactions processed and their weight in terms of GDP.

24. **Trading of FX domestic transactions is done through the CFETS or the over-the-counter (OTC) market.** The CFETS was launched in 1994 built by CFETC/National Interbank Funding Center (CFETC) to provide the interbank FX market with trading and settlement services. In 2006, trading in forward, swaps and foreign currency pairs was added. The CFETC currently

Table 3. Foreign Currency Denominated Transactions Handled by China Domestic Foreign Currency Payment Systems

Currency	2008			2009		
	Volume	Value (US\$ million)	% Value/GDP (2)	Volume	Value (US\$ million)	% Value/GDP (3)
U.S. \$	68,594	7,447	0.1693	272,107	45,918	0.9208
Euro	900	290	0.0066	3,872	2,409	0.0483
HKD	1,101	107	0.0024	2,705	1,308	0.0263
Jp Yen	429	197	0.0045	1,889	905	0.0181
GBP	57	2.05	0.00005	832	38.80	0.0008
Aust. Dollar	142	3.47	0.0001	1,059	38.00	0.0008
Can. Dollar	54	0.96	0.00002	472	14.69	0.0003
Swiss Franc	4	0.14	0.000003	14	2.80	0.0001

Source: PBC China Payment System Development Reports 2008 and 2009.

(1) 2008 GDP: CY 30,100 billion. 2008 year-end CY/ US\$ conversion rate: 6.8434.

(2) 2009 GDP: CY 34,050 billion. 2009 year-end CY/ US\$ conversion rate: 6.8282.

operates five markets: CY/FX spot, CY/FX forward, CY/FX swap, foreign currency swap and trading in foreign currencies.⁴ At end 2009, there were 276 (265 banks and 11 nonbank financial institutions (NBFIs)) participants in the CY/FX spot market, 73 in the CY/FX forward, 71 in the CY/FX swap, 20 in the currency swap and 85 in the foreign currencies trading market. The mission team did not have access to detailed information on spot transactions. The Bank for International Settlements (BIS) reported a daily average trading of US\$30 billion (of which US\$19.8 billion are on-shore transactions) for CY/US\$ spot transactions during April 2010. CFETS reported to the mission team value of transactions for CY/FX swaps and forwards for 2008 and 2009 (see Table 4). No information was provided for foreign currency pairs.

Table 4. FX Transactions Handled by China Foreign Exchange Trade System

Transaction Type	2008			2009		
	Volume	Value (US\$ billion)	% Value/GDP (2)	Volume	Value (US\$ billion)	% Value/GDP (3)
CY/FX spot	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
CY/FX Forward	n.a.	17.4	0.3955	n.a.	9.8	0.196
CY/FX swap	n.a.	440.3	10.01	n.a.	801.8	16.07

Source: CFETS.

(1) 2008 GDP: CY 30,100 billion. 2008 year-end CY/ US\$ conversion rate: 6.8434.

(2) 2009 GDP: CY 34,050 billion. 2009 year-end CY/ US\$ conversion rate: 6.8282.

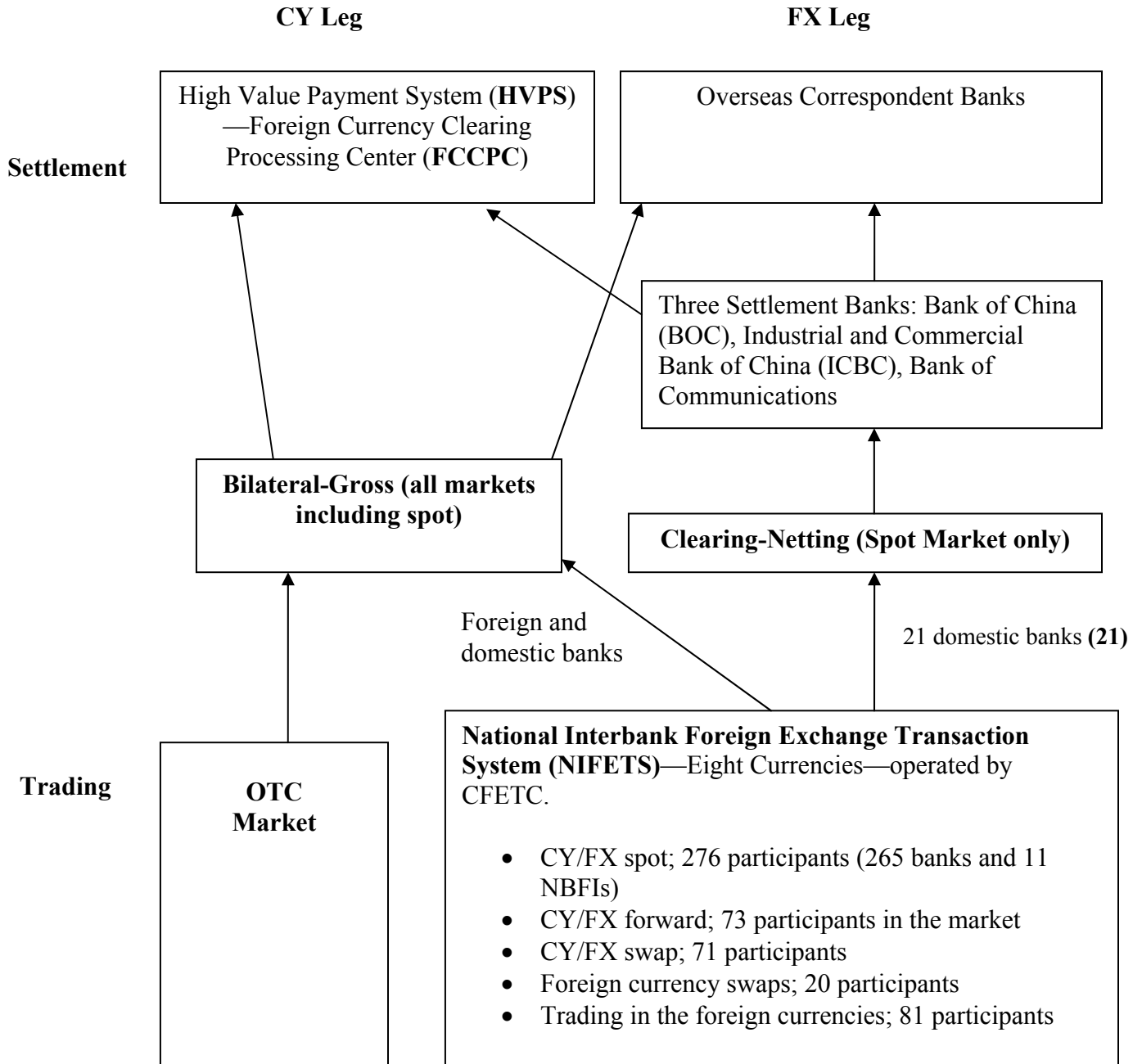
⁴ Products in the OTC market include forward CY/FX and FX swap. Enterprises and nonbanking financial institutions, in line with their needs, can participate in the CY/FX derivative transactions in the OTC market to hedge risks. Banks can participate in the CY/FX derivative transactions in the interbank FX market. Enterprises, according to their needs, can conduct CY/FX derivative transactions via banks.

25. **FX transactions among domestic operators are settled through two main methods (see Figure 3).** Twenty one market participants settle their obligations on a multilateral net basis using the CFETS, The System was launched in 1994, is operated and maintained by the CFETC, and uses the HVPS to settle the CY leg and different domestic settlement banks to settle foreign currency transactions depending. The CFETC operates as CCP in the system. Risk management tools include clearing membership requirements, a clearing revolving fund and daily clearing limits among others. Settlement cycle is T+2. Novation of obligations takes place through guidelines issued by CFETS and agreements between CFETS and each clearing member. Those institutions that do not operate in the CFETS settle their operations bilaterally by settling the CY leg in the HVPS and the foreign currency leg through correspondent banking arrangements abroad.

26. **Regarding the use of payment instruments, China is evolving to a more intensive use of non-cash payment instruments, especially cards.** The relationship of cash (M0) to GDP has been declining since the beginning of the 2000 from a level of 14.8 percent of GDP in 2000 to 11.42 percent in 2009. Bank cards issuance have been increasing at a high pace and approximately 2.07 billion had been issued at end-2009, of which 1.88 billion were debit cards. Bank cards have therefore become the primary non-cash payment instrument in China accounting for over 90 percent on the total non-cash volume in 2009. Both volume and value of bankcard transactions had been rising continuously since 2002. In 2008, the total volume and value of bankcard transactions, which includes transactions over bank counters and at all kinds of terminals, regardless if on us or interbank, reached CY 16.67 billion and CY 127.16 trillion respectively. In 2009, the total volume of bankcard transactions reached 19.691 billion, an increase of 18.1 percent over the previous year, for a value of CY 165.99 trillion, an increase of 30.5 percent over the previous year. Fund transfers and bill payments grew faster than cash transactions.

27. **Cards acceptance is also increasing: 1.57 million merchants accepting cards payments, 2.41 million POS terminals and 215 thousand ATMs at the end of 2009.** There is a steep increasing path, especially since the mid-2000s. Growth rates for merchants accepting cards were 59.9 percent and 32.6 percent respectively in 2008 and 2009. Growth rates of POS terminals were 56.2 percent and 30.5 percent respectively in 2008 and 2009. An impressive card penetration rate of over 25 percent is observed, calculated as the total value of retail card payments over the total retail sales. Growth rates of ATMs were lower with 28.4 percent and 28.3 percent respectively in 2008 and 2009. However, it needs to be noted that ATMs are still primarily used for cash withdrawals and much less for payment and transfer purposes.

Figure 3. China Foreign Exchange Trade System



28. **Internal migrants in twelve major export processing provinces use payment cards for sending remittances home.** The PBC has collaborated with CUP and Postal Savings banks, to provide this service. The migrant workers can deposit funds at his workplace and link a payment card that can be used to withdraw these funds at their home-town, at ATMs, merchant outlets and Postal savings bank branches. In 2007, this service was used to remit over CY 2 billion. This service is being gradually extended to other provinces, and is also being made available at other rural financial institutions.

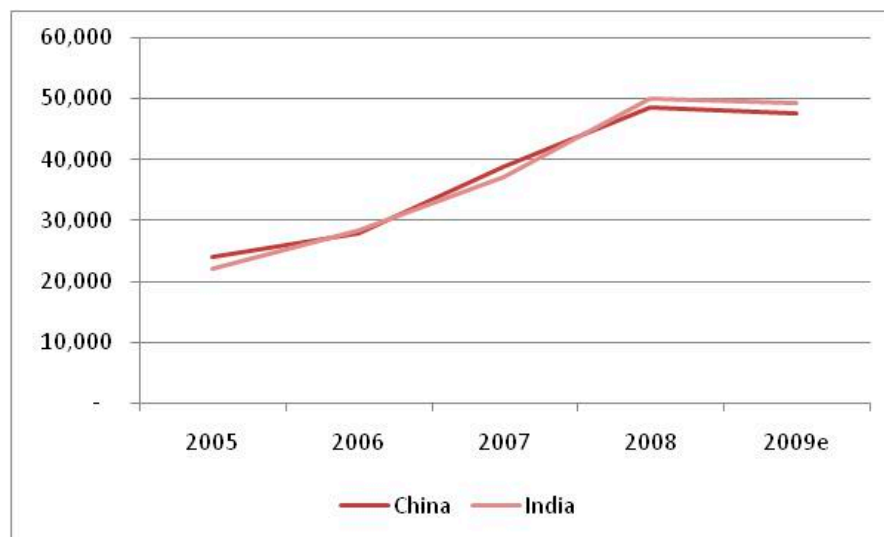
29. **The PBC is collaborating with CUP to migrate cash payments to payment cards in major rural trading hubs.** In 2007, the PBC initiated a focused project for the vegetable marketplace in the Shandong province and achieved great success, moving over CY 2.7 billion cash transactions to electronic means. This project involved equipping wholesale traders with payment cards; sellers with POS terminals and directly crediting their bank accounts for sales; providing sellers with debit cards linked to their accounts and finally providing telephone banking services in the local banks allowing for wholesale traders to move funds electronically. A similar initiative on leather in Haining town reduced cash transactions in the local banks by over 20 percent.

30. **Cheques are hardly used by individuals, but they constitute an important volume and value of legal persons' payments, and to some extent interbank transactions.** In 2009, 854 million cheques were issued for a value of CY 248 trillion. Credit transfers and direct debits are also quickly developing in China, reaching 847 million transactions for a value of CY 279 trillion in 2009. Other payments instruments such as banks drafts, commercial drafts, promissory notes and domestic letters of credit are used with a much lower volume/value and decreasing importance.

31. **China receives the biggest inflows of remittances worldwide after India (see Figure 4).** The WB estimates that US\$47,553 million was sent to China in 2009, representing 1.1 percent of China's GDP. Notwithstanding the relevance of the inflows, it is very expensive to send money to China. According to the WB Remittance Prices Worldwide database, the average total cost of sending US\$200 to China from selected sending countries⁵ was 12.55 percent. Even though this value has decreased over the last two years, China is still among the 20 most expensive receiving countries globally. In order to reduce the cost of remittances it is suggested that Chinese authorities consider implementing the CPSS-WB General Principles for International Remittance Services and proactively embrace the Group of Eight (G-8) and Group of Twenty (G-20) Global Objective of reducing remittance costs by five percentage points in five years. It needs to be noted that the cost of remittances also depends on actions and shortfalls in the sending countries.

⁵ France, Germany, Italy, Japan, Singapore, Spain, United Kingdom, and United States of America. Cost includes the transaction fee and exchange rate margin. Average is un-weighted and does not reflect the market shares of the different firms that compose the average.

Figure 4. International Remittance Inflows (US\$ million)



Source: The WB, Migration and Remittances Team.

32. **The legal and regulatory frameworks supporting payment arrangements are comprehensive in China. However, important payment system issues like protection for settlement finality and legal validation of netting are not covered at the level of the law.**

33. **PBC powers to oversee payment and settlement systems have a sound and clear legal basis, CSRC has overlapping oversight powers on the securities settlements.** PBC oversight and regulatory powers over retail payments, interbank payments, securities settlements and related functions are recognized in the legal framework. These powers are articulated in the Article 4 of the “Peoples Bank of China law.” The securities commission also has oversight powers over securities settlements, including government securities, derived from Article 179 of the “Securities law.” **A formal MoU defines general cooperation arrangements among the PBC, MOF and other authorities, such as the CSRC and the China Banking Regulatory Commission (CBRC).** There is no specific MoU defining the modus operandi of these authorities over payment and settlement systems, however, there have been frequent coordinated actions and regular meetings at the technical level.

34. **The PBC carries out its oversight function over all payment arrangements in the country.** In addition to overseeing the systemically important payment systems in the country, the PBC has played a catalyst role in reforming interbank payment arrangements in China. Recently, PBC oversight has been extended to nonbank payment service providers. However, the PBC has not issued a comprehensive document covering the objectives, scope, instruments and institutional arrangements of its oversight function as yet.

35. **The PBC has implemented a data analysis platform to assist in its oversight activities.** The Payment Management Information System (PMIS) gathers payment and settlement information from various systems including HVPS and BEPS. This system provides various standard analytical reports and various ad-hoc analysis features which assist PBC in its oversight activities. PMIS also enabled the PBC to monitor the liquidity position of the participants in real-time.

36. **The PBC has not yet formally established any national payments council.** The central bank has legal authority to establish a self-regulated China payments and clearing association, but it has not yet established one, although it is working on a project to create the China National Payment and Clearing Association.

37. **The PBC, in cooperation with other authorities and relevant stakeholders, is working on a number of projects to further improve the safety and efficiency of the CNPS. They include: the launch of a “second generation” version of the CNAPS; a reform of key aspects of the legal and regulatory framework; and initiatives to further increase the penetration of retail payment services, in particular in rural areas and through the use of innovative channels and modalities.**

IV. THE CPSS CORE PRINCIPLES

A. Assessment of the CPs and Central Bank Responsibilities

38. **The HVPS is a systemically important payment system as it is the backbone of the National Payments System in China. The HVPS handled transactions for a value of 804 trillion CY in 2009, approximately 24 times the GDP value.** Thus, the HVPS is being assessed below against the ten CPs for Systemically Important Systems (CPSIPS) of the CPSS and the four Responsibilities of the central banks in applying the CPSIPS. The HVPS is part of the CNAPS which comprises also the BEPS. The BEPS is not currently a systemically important payment system. However, its importance for an efficient settlement of the interbank payment system is growing. In light of these considerations, Box 1 elaborates on some of the specific features of the BEPS and the system handling of major risks. It needs to be noted that most of the features of and considerations for the BEPS are the same as presented in the HVPS assessment in Table 5 below (in particular on legal, efficiency, operational reliability, access, and governance).

39. **The Cheque Clearinghouses around the country also handle an important value of transactions but the analysis of interbank data excludes that this system be considered systemically important.** The gross value of cheques issued in 2009 reached a value of CY 248 trillion in 2009, about 7.4 times the GDP. However, of this amount, 350 million cheques are interbank cheques valued at about CY 62.5 trillion. This means that the majority of the cheques issued in the country are “on us” cheques issued by and presented for payment at the

Box 1. Bulk Electronic Payment System (BEPS)—Clearing and Settlement

The BEPS started operations in June 2005. It is an integral part of the CNAPS and is primarily used for electronic credit of eligible single transaction value (up to CY 50,000) and debit payment transactions. Payment instructions are sent in batches and cleared on a netting basis. It is primarily used to provide low-cost clearing services to large volume payment transactions. It supports all payment instruments and operates on a 7x24 basis. In 2009, the BEPS handled 226 million transactions for an amount of 11.46 trillion Yuan.

The BEPS has adopted a number of credit and liquidity risk management measures. First, only those institutions that meet certain risk profiles and specific requirements have access to the system. Second, system participants use the same HVPS settlement accounts and have access to HVPS liquidity facilities. Third, it envisages a fully collateralized net debit limit for direct participants. Fourth, participants are allowed to make real time adjustments to the net debit limit by providing earmarked funds or increasing their collateral. Fifth, multilateral offsetting mechanisms are in place within the queuing system to increase efficiency in the clearing process. Clearing procedures do not allow for unwinding in case of inability to settle by one or more participants in the system. Liquidity facilities and collateral would be rather activated in these cases.

Based on the net debit limit, the BEPS exercises control over payment orders executed by participants and automatically places in a queue, based on a chronological order, those transactions that exceed the limit. Participants may adjust the order within or remove the orders from the queue.

The BEPS settles its multilateral net balances at fixed cut-off times in the HVPS. As mentioned, the BEPS operates without interruption on a 7 x 24 basis. The operating hours of each working day are from 16:00 of the previous settlement day to 16:00 of the current settlement day. At the work day cutoff hour (16:00), the net multilateral balance of the last round of the day is submitted for settlement. When the HVPS receives the net balances, it immediately handles the settlement.

Article 11 of *Administrative Methods for the Handling of Low Value Payment System Operations* states: “Once the balance has been netted, the payments processed by the BEPS shall be final and irrevocable. When a financial institution of the banking industry receives the payment credit information whose balance has been offset or the payments debit information whose balance has been offset, it should debit the account of the confirmed payment recipient.”

During a legal holiday (non-working days of the HVPS), the BEPS continues to process its clearing function, but each day only one round of net balance offset is generated, which is submitted for settlement on the first available working day of the HVPS. Credit risk measures continue to apply to the clearing process even if settlement is not completed.

The BEPS pricing differentiates intra-city and intercity transactions based on different types of operations and time periods, and charges anywhere from CY 0.03 to CY 0.75 for each transaction.

Since the BEPS went online for operations, no serious settlement risk issue has ever occurred, nor has any major failure or incident impacting system operations occurred.

same commercial banks for internal settlement purpose. As noted, interbank cheques are cleared and settled through cheque image clearing system and 1,239 local clearing houses, with funds settled through BEPS and HVPS by utilizing Reserve Deposit Accounts held by financial institutions at PBC, where any high value cheque (for an amount greater than CY 500,000) must be physically presented to drawer's bank for confirmation and payment. The PBC is encouraged to continue working on eliminating large value items from the cheque clearing process and provide incentives to use electronic means of payments. This observation is reflected in the assessment of Responsibility B. Also, ACHs handled CY 69 trillion in 2009, about twice the GDP, relatively important (though not major) for a big country like China. Thus, also the relative importance of the ACHs has been taken into consideration in the assessment of Responsibility B and C.

40. **As noted, domestic FX transactions are mostly executed at the CFETC.** As mentioned, while the majority of participants settle their transactions bilaterally, 21 participants use a net clearing model, and the CFETC acts as CCP. Settlement of the CY leg occurs through the HVPS and settlement of the foreign currency leg with domestic settlement banks at which participants hold FX accounts. There are quotas applied to the amount of overseas borrowing in foreign currency⁶ and also to the total amount of foreign currency holdings in settlement accounts.⁷ The mission was not provided with complete data of the transactions cleared and settled through the multilateral arrangement nor has the PBC conducted an assessment of this payment system. However, in light of the nature of these transactions and the potential systemic importance of the system, the PBC is urged to assess the compliance of this system with international standards as soon as possible.

41. **As mentioned above, the FCPS was launched in April 2008 to handle the clearing and settlement of domestic foreign currency denominated transactions.** The FCPS is a RTGS system and currently handles payment transactions in Hong Kong Dollar, U.S. Dollar, Euro, Canadian Dollar, Australian Dollar, Sterling Pound, Japanese Yen, and Swiss Franc (no CY transaction is accepted). The FCPS is operated and maintained by the CNCC, with Industrial and Commercial Bank of China, BOC, CCB, and Shanghai Pudong Development Bank designated as its "Proxy Settlement Banks" (PSBs). The values settled in the system do not show a systemic importance of the system (see Table 3). Nonetheless, the PBC conducted a self assessment of the system whose main conclusions are reported in Appendix I.

⁶ According to the *Administrative Rules for the Pilot Program of CY Settlement of Cross-Border Trade Transactions*, a domestic agent bank may provide financing for the inter-bank CY fund transfer account opened by an overseas participating bank, and also settlement banks in Hong Kong and Macau can borrow and lend CY in the interbank market for clearing and settlement purposes.

⁷ SAFE applies quotas on banks' FX positions for operations on clients' behalf, for its own, or for participating in the interbank FX market. These quotas are jointly determined for positions in the OTC market, positions by market-makers, and positions on individual currencies.

42. **The assessment of systemically important payment systems is conducted over existing payment systems/arrangements, although relevant projects and reforms are taken into account.** Each CP and Central Bank Responsibility was assessed on a qualitative basis based on a five-fold assessment categorization: observed, broadly observed, partly observed, non-observed, and not applicable. A CP is considered *observed* whenever all assessment criteria are generally met without any significant deficiencies. A CP is considered *broadly observed* whenever only minor shortcomings are found, which do not raise major concerns and when corrective actions to achieve full observance with the CP are scheduled and realistically achievable within a prescribed period of time. A CP is considered *partly observed* whenever the shortcomings are sufficient to raise doubts about the ability to achieve observance within a reasonable time frame. A CP is considered *non-observed* whenever major shortcomings are found in adhering with the assessment criteria. Whenever a system is assessed to be broadly, partly or non-observed with a CP, recommendations are proposed for achieving full observance. A CP is considered *not applicable* whenever it does not apply given the structural, legal and institutional conditions. The detailed assessment and recommended actions are presented in tables 5-8 below.

Table 5. Detailed Assessment of Observance of CPSS Core Principles for SIPS—High Value Payment System (HVPS) Part of the China National Advanced Payment System⁸

<i>CP I – The system should have a well-founded legal basis under all relevant jurisdiction.</i>	
Description	<p>A relatively complete legal framework⁹ is in place for payment systems in China. The payment system is governed by two categories of Legislation, namely general laws and special law, as well as by-laws, regulations and rules and procedures. The most important include:</p> <ul style="list-style-type: none"> • General laws (among others, <i>General Principles of The Civil Law, Code of Civil Procedures, Contract Law, Consumer Protection Law, Anti-Unfair Competition Law, Enterprise Bankruptcy Law, Property Law, Guarantee Law, Price Law, Administrative Procedural Law, Administrative License Law, Administrative Penalty Law, Emergency Response Law and Electronic Signature Law</i>). • Specific laws (among others, <i>The PBC Law, Commercial Bank Law, Banking Supervision Law, Negotiable Instruments Law, Anti-Money Laundering Law and Securities Law</i>). • By-laws and Regulation (among others, <i>Measures for Punishing Illegal Banking Activities, Rules on Using Real Names for Opening Individual Deposit Accounts, Renminbi Administration Regulations, Cash Administration Regulations, Regulations on Disposal of Risks in Securities Firms, Regulations on Supervision and Administration of Securities Firms, Regulations on Closure of Financial Institutions, Measures for the Implementation of Administration of Rules of Negotiable Instruments, Administrative Rules for the Operation of Electronic Commercial Bill of Exchange, Payment and Settlement Rules, Administrative Rules for Renminbi Bank Settlement Accounts, Administrative Rules for Bond Transactions in National Inter-bank Bond Market, Administrative Rules for Securities Registration and Settlement, and Anti-Money Laundering Rules for Financial Institutions</i>). • Rules and Procedures (e.g., <i>Operational Procedures for High-Value Payment System, Operational Procedures for BEPS, and Rules for the Administration of Electronic Commercial Draft System</i>). <p>However, there is no dedicated legislation regarding the national payments system. Thus, some of the aspects related to payments systems (e.g. clarity of timing of final settlement especially when there is an insolvency; legal recognition of netting arrangements) are only included at the level of by-laws and regulations or PBC rules and procedures.</p>

⁸ In addition to the HVPS, the CNAPS also comprises the Bulk Electronic Payment System (BEPS). The BEPS is an important payment application but was not qualified as a SIPS.

⁹ The laws and regulations in China are classified, by virtue of their legal status and effect, as Legislations, Administrative Regulations, Ministerial Rules and Normative Documents. Legislations refer to governing documents, which are preceded only by the Constitution and promulgated by the legislative body, namely the National People's Congress and its Standing Committee. Administrative Regulations, preceded by Legislation, refer to regulatory documents promulgated by SC, the top executive body to implement Constitution and Legislations to govern administrative matters of the State. Ministerial Rules refer to orders, directives, rules and other normative documents, which are preceded by Administrative Regulation and promulgated by various ministries of the SC.

	<p>The <i>Electronic Signatures Law</i>, the <i>Contract Law</i>, the <i>Administrative Procedure Law</i> and PBC rules and procedures (e.g., <i>Methods for the Administration of High Value Payment Operations</i>, <i>Methods for the Handling of Low Value Payment System Operations</i>) provide a legal framework that supports electronic processing of payments.</p> <p>Collateral rights are covered by the 1995 <i>Guarantee Law</i>, the 2007 <i>Property Law</i>, and the 2007 <i>Corporate Bankruptcy Law</i>.</p> <p>In China, there are appropriate penalty clauses for failure of enforcement and appropriate supervisory and management authorities are responsible for supervising the enforcement of laws and contracts. There is also a requirement that laws and regulations in the field of payment systems must be enforced.</p> <p>The legal basis for oversight by the PBC of the interbank payment systems, retail payment systems and bond registration and settlement is <i>The PBC Law</i> (see discussion under Central Bank Responsibility A below).</p> <p><i>The 1993 Anti-Unfair Competition Law of the PRC</i> requires governments at various levels to adopt measures to stop unfair competitive actions in order to create a good environment and condition for fair competition and encourage and support all organizations and individuals in performing social oversight of unfair competition. Successively, the 2008 <i>Anti-Trust Law of the PRC</i> also provides for the state to formulate and implement competition rules. The <i>1994 Law of the PRC for Protection of Consumer Interest</i> provides for the principles of free will, equality, fairness and good faith. The state protects the legitimate rights and interests of the consumer from being harmed. The above laws are equally applicable to payment systems.</p> <p>The HVPS is explicitly governed by the principle of “territory.” All participants are legally incorporated in China, no cross-border links exist with other international systems and the system’s procedures are fully covered by China’s applicable laws and regulations with no application of law outside the jurisdictions of the country.</p>
Assessment	Partly observed
Comments	<p>There are important improvement opportunities in the overall legal foundation. For example, the legal recognition of netting arrangements is not found at the law level but rather covered in administrative regulation and payment system rules and procedures.</p> <p>Furthermore, <i>Enterprise Bankruptcy Law</i> and related judicial interpretations define rules similar to the “zero hour rule,” but they do not specify any time point for determining validity of payment transactions nor any waiver of “zero hour rule” for settlement. The above shortfalls have an important impact on settlement finality.</p> <p>The RTGS nature of the system does not by itself protect it from a decision of a Court of Law to nullify payments, even if they have been accepted by the system and deemed irrevocable by its rules.</p> <p>Chinese authorities are aware of these shortcomings and are considering to enact a payment system law, which would address these issues and streamline the overall legal framework. Independently of the payments system law, the Chinese authorities are also seeking a legal interpretation or amendment of the <i>Enterprise Bankruptcy Law</i> to avoid the effects of the ambiguity about the “zero hour rule” in relation to payments system finality.</p>

	<p>Also, The PBC is working to elevate the rules and procedures of major payment systems to the rank of central bank regulation.</p> <p>Finally, the PBC recently promulgated new <i>Rules for the Organization and Administration of Payments and Settlement System</i>, which will cover the responsibilities of non-financial institutions engaged in the provision of payment services. These rules were prepared in cooperation with the CBRC. In addition, the PBC is actively promoting the launching of regulations in order to further regulate the bank card business with a view to protecting the legitimate rights and interests of various participants in the market.</p>
<i>CP II – The system’s rules and procedures should enable participants to have a clear understanding of the system’s impact on each of the financial risks they incur through participation in it.</i>	
Description	<p>The PBC formulated and issued <i>Operational Procedures for High-Value Payment System</i>, <i>Operational Procedures for BEPS</i>, <i>Rules for Operation and Administration of CNAPS</i>, <i>Rules for Participating and Quitting Payment Systems by Banking Institutions</i>, <i>Crisis Response Plan for Payment Clearing Systems</i>, and other rules and procedures.</p> <p>These rules are clear, comprehensive and up to date. They include details of the system design and timetable and define credit risks, liquidity risks, legal risks, and operational risks, as well as safeguards against these risks. Participants may access these rules and procedures through multiple channels. The rules also explain where there is discretion and how it is exercised (e.g., handling priority order of the payments in the queue). In addition, the <i>Plan for Emergency Handling of Crises in the Payment System</i> has clearly provided the principles for decision making in dealing with abnormal conditions, notification procedures and a response schedule.</p>
Assessment	Observed
Comments	Although participants seem to be aware of the potential legal risk related to the lack of finality at the level of the law, covered under CP I, and are expecting Chinese authorities to fix it, the PBC might want to engage in regular discussions with system participants on this matter.
<i>CP III – The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.</i>	
Description	<p>The HVPS counts on multiple safeguards against credit risks and liquidity risks, clearly defines responsibilities of system operator and participants and establishes a mechanism to drive participants to manage and contain each risk. The system has operated soundly and stably since its inception.</p> <p><i>Credit risk management tools:</i></p> <ul style="list-style-type: none"> • The HVPS is a RTGS system. Therefore, payment instructions are settled only when there are sufficient available funds in the settlement account of the payer. • In addition, for a financial institution to join the payment system it should have high standards, such as meeting the technical and security requirements for joining the payment system; a sound internal control system; having a feasible plan for preventing and removing payment settlement risks, etc. • Also, the PBC may request participants with poor financial conditions or that seriously violate the system’s rules to withdraw from the system.

Liquidity risk management tools:

- Mobilization of reserve requirements. System participants are allowed to use their required reserve balance for payments during the operating day. However, they have to reconstitute their reserve balance at the end of the day. In order not to incur in penalties, most banks hold excess reserves in their “settlement” accounts.
- Queuing mechanisms are in place. The priority rules for the queue are as follows: (1) rectification of errors; (2) rush High Value payment (e.g., disaster relief); (3) intraday overdraft interest and operational fees; (4) settlement of net balances of Inter-city negotiable instruments; (5) settlement of low value system net balances; (6) urgent high value payment; and (7) ordinary high value payment and time critical. Payments in a queue with the same priority level are chronologically processed. A direct participant may adjust the priority order of rush, urgent and ordinary high value payments in the queue. Pending payments in the queue are rejected at the end of the operating day.
- Intraday liquidity facilities. The system provides a collateralized intraday liquidity facility (“automatic pledge financing mechanism”) and an intraday overdraft mechanism. The former is already activated and works in two processing modes: automatic triggering and manual triggering. The eligible collateral includes: government bonds, central bank bills and bonds, and policy banks bonds deposited in the CCDC as well as other tradable securities approved by the PBC. Based on the capital, credit status and liquidity management conditions, the PBC sets and adjusts the maximum balance of the automatic pledge financing of participants (banks). The maximum amount of the intraday liquidity facility of state owned commercial banks and joint stock commercial banks has been temporarily set not to exceed two percent of the disbursed capital; for urban commercial banks and urban and rural credit co-ops, not to exceed five percent of the disbursed capital . Also, the PBC monitors and limits the total value of collateralized intraday credit provided during the day. There is collateral haircut of 10 percent. The interest rate for the intraday collateralized facility is the re-discount interest rate of the PBC minus 0.27 percent. The collateralized intraday facility has not been activated yet.
- Throughput management measures of the payment system mainly include: (1) requiring participants to promptly handle payments instructions from clients; (2) differentiating fees by time segments encouraging participants to send payments evenly distributed throughout the day; (3) undertaking Low Value Payment System settlement several times during the day, to avoid building up of high net settlement balances; and (4) system alerts to participants to ensure that all payment submitted are settled within the day.

General tools

- Both High and Low Value Payment Systems provide real time feedback, balance alert and position inquiry functions for payments status and settlement account status.
- The system operator monitors payments and accounts status through the monitoring terminals of the system. It also monitors participant logging, low value netting balance, verification of authenticity, and any potential abnormal situations with the end of day account reconciliation and daily messages in order to promptly take appropriate measures or notify the relevant participants.
- The system operator may also, with help from the PMIS, perform real time monitoring of situations such as payment system participant liquidity, business volume and abnormal transactions, etc. It can also as well monitor low value system netting balances build up, opening of the settlement window, etc.

	<ul style="list-style-type: none"> In addition, the PBC has also created other measures designed to urge participants to enhance other risk management tools, and has created a penalty mechanism against participants with poor risk management: (1) each year, a notice is circulated regarding the situation of risk management by participants; (2) a meeting is held to exchange advanced experiences on risk control by participants; and (3) participants who have caused risks repeatedly and who have seriously affected payments are compelled to withdraw from the system.
Assessment	Observed
Comments	<p>The system counts on multiple tools to manage liquidity risk. Under current circumstances (relatively high reserve requirements, relatively abundant liquidity, etc.), participants have not used intra-day liquidity facilities. In addition to favorable liquidity conditions, participants might feel that the collateralized facility is particularly penalizing (the combination of collateralization, haircut and charging), and some perceive that the central bank might not necessarily favor the use of this instrument.</p> <p>As conditions evolve, the PBC might want to maintain flexibility in the conditions applied to intra-day liquidity facilities and consider the removal of charging for collateralized credit.</p>
<i>CP IV – The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.</i>	
Description	HVPS rules and procedures clarify that payment transactions shall be final and irrevocable upon settlement, and define the timing of final settlement for payment transactions as the end of the same day that a transaction is accepted for processing by the system. The system implemented risk alerts during the operational day, real-time monitoring, penalty interest loans and other measures to ensure system participants strictly comply with operating hours and perform the settlement process.
Assessment	Observed
Comments	The caveat is the legal discussion on settlement finality covered under CP I.
<i>CP V – A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.</i>	
Description	The HVPS is a RTGS system.
Assessment	Not applicable
Comments	-
<i>CP VI – Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.</i>	
Description	Settlement in the HVPS occurs at the participants' settlement ("clearing" following the domestic terminology) accounts maintained with the PBC, either owned by themselves or by their settlement agents.
Assessment	Observed
Comments	-
<i>CP VII – The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.</i>	

Description	<p>PBC Rules for Operation and Administration of HVPS¹⁰ provide a framework for ensuring payment systems security and operational reliability. Roles and responsibilities are clearly defined and assigned with respect to system security, operations and maintenance. The HVPS has a set of security measures such as private networks, hot backup system, backup communication lines, encrypted transmission of payment information, identity verification between system nodes, and offsite backup system (which creates a real-time backup of production center data in backup center, significantly enhancing the system resiliency).</p> <p>In addition, the PBC promulgated the <i>Crisis Response Plan for Payment Settlement Systems</i>, built a business continuity plan and organized some crisis response drills. Since its entry into operations in late June 2005, the HVPS has recorded nor major operational settlement problem, neither any major failure or incident jeopardizing system operations and service provision.</p> <p>General requirements</p> <p>The HVPS system meets domestic and internationals security standards. For example, HVPS perform legitimacy checks on the payment information and imposes business authentication, uses dedicated payment system networks for information transmissions and encrypted communications lines. The HVPS also adopts security measures such as firewalls for external networks to meet adequate security levels.</p> <p>Both the PBC and participants perform responsibilities in relation to system security and operating reliability.</p> <p>At the PBC, internal departments of the PBC have responsibilities to guarantee the safe and efficient operations of the system. The Payment and Settlement Department of the PBC is responsible for the operational security management of the HVPS. The Information Technology (IT) Department is responsible for technical security management. The General Clearing Center is responsible for operating security management. PBC sub-branches perform security management of local participants in the HVPS.</p> <p>Payment system participants are responsible for the security and operating reliability of their own nodes. Under the guidance and management of the branches and sub-branches of the PBC at their locations, payment system participants shall safeguard the payment system security and operating reliability in terms of software and hardware equipment, connection with the network of the city processing center as well as business operations management of the front end processors of the payment system.</p> <p>Regarding the physical structure, the HVPS is divided into the NPC, city processing centers (LPCs) and front end processors of participants. Various nodes have monitoring functions of the node status and provide prompt alerts in case of a failure, to facilitate trouble shooting by technicians. Various nodes provide monitoring and early warning functions, so that the PBC and various participants are responsible for the relevant system monitoring.</p>
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¹⁰ The operational reliability and business continuity of the HVPS coincides with those of the CNAPS and are, therefore, the same for the BEPS, as well.

	<p>In terms of business monitoring and operation maintenance mechanisms, the HVPS has automatic handling of system failures to the greatest extent by providing comprehensive, real time operations monitoring functions; setting up standardized operations and maintenance processes; prompt early warning upon discovery of any abnormal condition; and create an advanced customer service platform to provide responsive and uniformly efficient technical support for the HVPS participants.</p> <p>In terms of system security management measures, HVPS has mainstream security products, such as IP encryption systems, firewall systems and PKI/CA systems to provide security services, such as identification, encryption, access control, integrity.</p> <p>The operations and maintenance personnel of the HVPS shall be highly qualified, talented personnel, all of whom need to be trained in the relevant special expertise and assume their posts with proper certificates.</p> <p>Security</p> <p>During system design, the HVPS was built around a clear security strategy in terms of network, data and disaster backup, etc. The goal of the system network security is to guarantee the reliability of the network, prevent illegal access and be able to support uninterrupted, 7 x 24 operations. The goal of the system data security is to guarantee the reliability, integrity and confidentiality of data transmission among the nodes. The basic goal of the disaster backup system is - without lowering the performance of the business system—to guarantee the data integrity, business continuity and uninterrupted operations and their quick recovery.</p> <p>The system security is consistent with commercially reasonable standards. For example, in terms of confidentiality, encryption measures must be taken for transmission of payments and information among various nodes of the system. Sensitive contents in the business data (such as user passwords, check payment passwords, bank account passwords, and PIN, etc.) are encrypted.</p> <p>In terms of availability, the system application system supports data redundancy technologies such as disk arrays and disk mirroring. The system provides a complete and convenient data backup strategy to guarantee prompt recovery when data is damaged. The backup data is stored at a different location to avoid damage.</p> <p>The system saves business data for at least 30 work days; the system can set the term of storage flexibly, and automatically delete business data that exceeded their term of storage. For business data within their term of storage, the system provides flexible historical data inquiry functions; for business data beyond their term of storage, the system can easily perform a backup, recovery and inquiry.</p> <p>The payment system has set up a strict polling system,¹¹ whereby security checks are performed regularly every year.</p>
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¹¹ Polling, or polled operation, in computer science, refers to actively sampling the status of an external device by a client program as a synchronous activity.

The payment system performs security checks and risk analyses each year and conducts rectifications of issues discovered in a timely manner. In terms of the contents of the security checks, the relevant state and the PBC standards are adopted by keeping up with new concepts in international IT.

Operating reliability

Upon the occurrence of a disaster at the location of the NPC, between the NPC backup center and the operating centers of the system, a real time business data backup is adopted.

Upon the occurrence of a disaster at the location of a city processing centers, the geographic location of such a city processing centers backup center should be accessible to staff members of the operating center within 60 minutes in extreme circumstances. Upon the occurrence of a disaster at an operating center (or in an emergency), the system immediately switches over to the backup center and can go into operations after the staff members are in place (within 60 minutes).

Upon the occurrence of a network interruption, the NPC can support parallel use of multiple lines at the city processing center and they can serve as backups for each other. The NPC also has a satellite communications line.

The system has a whole set of files such as *Operations and Management Methods for China's National Advanced Payment System*, *Overall Plan for Promotion and Switching Payment Systems and Interim Methods for Management of Software Versions of Payment System Applications*, which give specific provisions for the security operations and trouble shooting, including operating procedures.

Any change to the system should first be authorized by the Payment and Settlement Department and IT department. Only after feasibility tests for business and technology are performed can a decision be made as to whether a change should be applied to the existing system. At the same time, the change should be recorded in a file.

The system designs have fully considered the status quo of volume and growth trends and have designed redundancies into the system capacity.

The HVPS has an effective and reliable internal control system to monitor operational risks.

Business continuity

The system has an official business continuity plan. In 2006, the PBC issued the *Plan for Emergency Handling of Crises in the Payment Settlement System*. In accordance with the plan, the PBC has repeatedly organized business continuity plan drills, the latest of which was conducted in August 2009.

When emergency arrangements were designed, consideration was given to the principle of simplicity and practicality, for example, a simple and clear failure report mechanism and practical data backup facilities.

The business continuity arrangements have a complete file record, such as: *Plan for Emergency Handling of Crises in the Payment Settlement System*, *Work Plan on Switching Operations for Standard Currency and Foreign Currency Settlement System*, *NPC*

Emergency Backup Switch Operations, Script for on Switching Operations for Standard Currency and Foreign Currency Settlement System, Emergency Backup Switch Operations, Emergency NPC Steps Switching Operations for Standard Currency and Foreign Currency Settlement System, and NPC Emergency backup Switch Operations, which are tested once every two years.

The High and Low Value Payment Systems share one set of equipment. The system includes the NPC, the city processing center and the front end processors of commercial banks on its nodes, to guarantee system integrity and operating reliability.

The NPC is equipped with two systems in the same machinery room. While one is in operations, the other is in a hot backup state ready to go into operations at any time, so that the equipment at the NPC has a sufficient fault tolerant capability, with an availability index that should be greater than **99.9 percent**. Once the operating system experiences any failure, the hot backup system can restore normal business handling within 30 minutes. The equipment failure at any single point will not affect the normal business handling of by the NPC. The ratio of the backup equipment and operating equipment is 1:1, where computer systems (including software) need to support hot backup functions. They need to be externally plugged in and support hot plug-in and unplugged disk subsystems. Communications equipment need also to support hot plug-in and unplugging.

The end processor systems of commercial banks also use the quantum hot backup model. Currently, an overwhelming majority of direct participants use the quantum hot backup model.

The telecommunications lines from direct participant to city processing centers have spare lines. When one of them experiences any failure, it automatically switches over to the spare line. The line switch does not affect normal data telecommunications.

Also, the main lines from city processing centers to the NPC use ground data telecommunications lines and have multiple spare lines.

Real time back up of business data is adopted between a backup center and an operating center.

The system has real time backup functions and business data can be restored when there is a need to switch. The backup system is located at the second point at a sufficient distance (> **1000 km**) from the main station and has independent different communications and power lines. Upon completion of a normal day, various city processing centers file all the business data handled during the day and send them to the backup center. The backup center shall use the business data filed by various city processing centers on the day of occurrence of the disaster as the basis for restoring the lost data.

The mainframe of the payment system uses highly reliable equipment. System designs should use redundancy technologies such as quantum hot backup and multiple processes in parallel, etc., and fully consider the need of the future disaster backup system. The nodes should not have single failure points and critical computer equipment must have sufficient fault tolerant and disaster tolerant capabilities.

Real time back up of business data is adopted between a backup center and an operating center.

	<p>Auditing</p> <p>The PBC internal auditing department performs regular audits on equipment, network and system security, generates complete auditing reports and evaluates operating risks.</p> <p>The PBC arranges for professionals to perform audits on the IT system and makes improvements to the system security performance based on the audit results.</p>
Assessment	Observed
Comments	<p>The system's framework to support business continuity and operational reliability is robust and safe. In principle, the segmented nature of the HVPS would increase operational risk. However, the PBC has managed this feature properly.</p> <p>The PBC is aware of the natural cycle of IT systems and has planned a major up-haul of HVPS operations to be launched in 2011 (so called "second generation"). The new system is expected to maintain a high degree of security and operational reliability.</p>
<i>CP VIII – The system should provide a means of making payments, which is practical for its users and efficient for the economy.</i>	
Description	<p>Since its entry into operation, the HVPS has been providing banking institutions and financial markets with efficient and secure clearing and settlement services. With respect to practicability, all functions predefined in system requirements analysis have been deployed and are running to satisfactorily meet needs of system participants and users; and with respect to efficiency, the system is running cost-effectively with technical performance and risk controls as designed to enable service provision and offer services at expected prices.</p> <p>Fund transfers are completed in less than a minute. The HVPS is connected to multiple systems, such as the payment systems within various financial institutions of the banking industry, the government securities depository (CCDC), the bankcard payment system, the CY interbank lending and FX trading system, etc. Thus, it provides secure and efficient settlement services for financial institutions of the banking industry and the financial market.</p> <p>The cost of the system builder and operator includes: investment in system development and construction; the cost of system operations and maintenance (mainly comprising the cost of equipment, sites and modifications, the cost of depreciation, networks and communications, water and electric bills, personnel payroll and office expenses); and the cost of system equipment repairs.</p> <p>The cost of system participants has three major components: first is the expense by the system participants in handling their operations, mainly the transfer fees paid to the PBC; second are other costs for the system participants, mainly comprising depreciation of fixed assets, personnel payroll and operating cost (line lease, vouchers and office products), etc.; third is the fund cost borne by the participants, including the opportunity cost for settlement account funds and collaterals, as well as the financing cost incurred by participants in raising sufficient clearing settlement account funds.</p> <p>HVPS designs, operations and management meet the need for efficiency mainly from the</p>

	<p>following aspects: first, compliance with technical indexes such as the business handling capacity, business handling time, the system response time and system reliability, etc.;¹² second, facilitation of access at low cost for small and medium-sized financial institution in correspondent and settlement business.¹³</p> <p>The initial investment in the development and construction of the system has been advanced by the financial authorities of the central government and it is gradually recovered based on the business volume. The cost of system operations and maintenance is recovered through fees based on the business volume. In light of these considerations and according to the principle of “total revenue = total cost,” the PBC has determined that the HVPS charge CNY 5.5 per transaction and the feeds for the BEPS.</p> <p>The HVPS is operated on the legal work days of the country. The system divides each work day into four time segments: daytime business operating hours, settlement window operating hour, end of day operating hours and business preparation hours.</p> <ul style="list-style-type: none"> • 8:30 to 17:00 are the daytime business operating hours; 17:00 is the cutoff time of operations. At this time, if the settlement account has no operations in the queue, then the system handles end of day operations; if the settlement account has operations in the queue; • 17:00 to 17:30 is the settlement window operating hour, used to clear the funds raised in various settlement accounts; • the end of the day operations are handled at 17:30; and • upon completion of the handling of the end of day operations, the business preparation hours for the next work day are entered.
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¹² First, in terms of operational capacity, the peak volume of the HVPS is about 460,000 transactions / hr. The intercity peak volume of the low value payment system is about 9.6 million transactions / hr. In terms of the operational handling time, the time for handling a transaction through the HVPS is less than 60 seconds at its fastest. There are two types of business handled for the low value payment system; batch and real time. The time for handling batch business in the same province is less than 30 seconds; for cross province batch business, less than 60 seconds. The real time in the same province is processed in less than 10 seconds; for cross province, in less than 20 seconds. In terms of system response time, the log on time to the high value and low value payment system is 3 seconds at a maximum; from entry of a message or file into the system to receipt return or system response, the time does not exceed 5 seconds. Finally, in terms of system reliability, the availability of both the high value and low value payment systems cannot be less than 99.9 percent of the total operating hours at a minimum; the average time for restoration does not exceed 20 minutes.

¹³ For participants with a low operating volume (such as rural credit cooperatives), several choices for low cost access methods are available. First is the centralized small front end processor method. This method allow rural credit cooperatives to operate as direct participants through a small front end processor system, that directly connects to the payment system front end processor, with various rural credit cooperatives within the province as indirect participants, where the small front end processor client end sends and receives payment transactions. The small front end processor system is an internal network system designed for rural credit cooperatives that have not set up a province wide comprehensive business system or acceptance system. Second is a shared front end processor method. This method refers to connection of the front end processor with the payment system, with multiple financial institutions connected to the shared front end processors, and operations are entered through the shared front end processors. The third choice is the payment settlement correspondent model. A financial institution may choose the local branch and sub-branch agency of a financial institution of the banking industry or a local branch or sub-branch of the PBOC as a correspondent bank to handle payment settlement business.

	<p>The work day and operating hours may be adjusted based on managerial need and are posted by the PBC in advance.</p> <p>The PMIS does not support real time verification by the participant of an account balance, but a participant may, through HVPS, launch an inquiry message to inquire about its settlement account balance in real time.</p> <p>The system is segmented in that financial institutions hold accounts with different branches of the PBC. In particular, HVPS participants have to maintain different settlement accounts with various payment systems operated by PBC, and cannot concentrate their liquidity in these settlement accounts. Moreover, there are many local payment and settlement systems that settle on the HVPS. Differences in risk management procedures of these local systems become a source of financial risks to the HVPS. Finally the SSS are equally fragmented and adds to the complexity of liquidity management in the overall payments system as well.¹⁴</p> <p>Furthermore, in some regions, there are limitations in terms of basic infrastructure and access to financial services. This results in great discrepancies across the countries in operating conditions and business capabilities. Such limitations have caused some resistance to nationwide promotion of the payment system. Based on the actual conditions in the above regions, such as a poor environment for payment settlement and weak financial institutions, etc., the PBC adopted the method of providing participants in those regions with free front end processors to facilitate their access, in order to open the local access to payment settlement transfers.</p> <p>System capacity is enhanced through system upgrades. In order to handle the growing volume of business, the PBC has upgraded all nodes of payment system in phases. Currently, a round of upgrading has been completed with all city processing centers. The NPC has completed several system upgrades and capacity expansions as needed. It is estimated that the system capacity now exceeds peak business volume by 1/3.</p>
Assessment	Broadly Observed
Comments	<p>Notwithstanding the important progresses achieved since the launch of the CNAPS, some features might be adjusted to increase efficiency and practicality to the users, such as:</p> <ul style="list-style-type: none"> • The “multiple access point” feature of the system might impact the efficient management of liquidity and adds to the cost of participating in it. • High value electronic transactions might still be perceived as relatively more expensive vis-à-vis large value cheque transactions, although it is noted that commercial banks are gradually switching their customers to other electronic payment options. • Operating hours could be extended to reflect the growing importance of the system. <p>The PBC is aware of most of these shortfalls and has designed the second generation system to address these issues, in particular by envisaging a single entry point and enhanced capacity. In particular, it must be noted that the multi-entry point was also a result of the lack of preparedness of participants to connect to a central facility. So, in this regard, the PBC worked to meet the needs of the users. New technologies and the several years of operations of the system might guarantee a smooth transition to a new more centralized system.</p>

¹⁴ SSS will be assessed in detail in the context of the CPSS-IOSCO assessment during the second FSAP mission.

<i>CP IX – The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.</i>	
Description	<p>The PBC promulgated the <i>Rules for Participating and Quitting Payment Systems by Banking Institutions</i>, which specifically define criteria for system participation, participation process and exit process. These Rules have been issued as a formal regulatory document to all banking institutions, and have been publicly disclosed through brochures, publications, websites and other channels. These Rules reflect the fact that the PBC is committed to fairness and competitiveness in system participation and applying the same set of criteria to all banking institutions that apply for system participation; and in order to maximize competitiveness, the PBC has been accommodative in setting criteria for system participation, and seeks to control risks through system design, service procedures and operational controls.</p> <p>In particular, the PBC has issued the <i>Methods for the Administration of the Joining of and Withdrawal from the Payment System by Institutions of the Banking Industry</i> to monitor constant compliance by participants with the access requirements.</p> <ul style="list-style-type: none"> • Financial institutions of the banking industry that join the payment system as direct participants should meet the following conditions: (1) handle CY settlement with approval from the banking regulatory authority; (2) open an CY deposit account with the PBC; (3) meet the technical and security indexes for joining the payment system; (4) have a sound internal control system; (5) have a feasible plan for preventing and eliminating settlement risks; and (6) other conditions specified by the PBC. • Conditions for financial institutions of the banking industry that join the payment system as indirect participants are determined by direct participant that clear funds on their behalf. This administrative method has been disclosed to the public through channels such as publicity flyers, official publications and official websites, etc. <p>At the same time, the PBC may compel participants with a poor credit to withdraw from the payment system. For example, those that seriously create disruptions to clearing and settlement procedures; those who, starting from the day they join the payment system, have caused the payment system settlement window not to close during the scheduled hours for three cumulative times due to a lack of liquidity; and other conditions that affect the safe and stable operations of the payment system, etc.</p>
Assessment	Observed
Comments	-
<i>CP X – The system’s governance arrangements should be effective, accountable and transparent.</i>	
Description	<p>The PBC makes it a central function to govern and oversee operations of the HVPS and the system participants. Internal functions of the PBC, including the Payment and Settlement Department, IT Department, Internal Auditing Department, and CNCC, are assigned to clearly delineated roles and responsibilities so they are making resolute and prompt decisions and communicating smoothly, clearly, timely and completely. Since its entry into operations, the HVPS has been running securely, smoothly and efficiently with ever increasing volume of transactions and a growing number of participants.</p> <p>Information related to the system and its operations is available through multiple channels :</p> <ul style="list-style-type: none"> • The PBC uses multiple methods, such as holding workshops/conferences, television appearances, press conferences and through public speeches of its leaders, payment

	<p>system briefings and payment clearing communications, etc., to publish information on payment system decision making and regularly circulate information on system operations.</p> <ul style="list-style-type: none"> • The PBC regularly publishes a Development Report on China’s Payment System, China’s Financial Yearbook and Annual Report of the PBC, to publicly disclose basic information on the development of China’s payment system, relevant data and future policy orientation. • Through publications, its official website (www.pbc.gov.cn) and other public media, the PBC publicly discloses information related to the HVPS and BEPS. For example, the published Compilation of China’s Payment Settlement System presents all the relevant features of the system; each quarter, important data on the payment system is made public on the official website and The Financial Times. <p>The PBC engaged the relevant stakeholders in the construction of the system and has open channels of communication with system participants on relevant matter. No formal users’ group is established for participants to provide regular feedback on systems’ operation. Participants are also not fully aware so far of the details of the “second generation” project. However, the PBC organizes meetings and workshops on a regular basis with payment system stakeholders.</p> <p>Regarding unexpected incidents, a Plan for Emergency Handling of Crises in the Payment Settlement System has been specifically formulated. It provides clear stipulations regarding the decision making and command processes by system managers after the occurrence of an unexpected incident.</p> <p>Most unexpected incidents can be summarized into the following three categories:</p> <ul style="list-style-type: none"> • Failure of a system or any of its nodes caused by natural disasters, disaster incidents or unexpected public security incidents; • Operation of any payment settlement system is seriously hindered as a result of human resource limitations caused by unexpected public health incidents or public security incidents; and • Failure of any payment system that cannot be recovered within a tolerable length of time. <p>The system does not fully observe all the CPs for SIPS.</p>
Assessment	Broadly observed
Comments	<p>As mentioned, the PBC is already addressing most of the existing shortfalls of the system and should be commended for the extraordinary effort to launch and operate a sophisticated and reliable payment system, which constitutes the backbone of China’s financial system.</p> <p>Involving more and more system participants in the “second generation” project and, eventually creating a formal users’ group will facilitate cooperation and foster the systems’ performance over time.</p> <p>Also, the regular rehearsal of crisis procedures for all types of emergency occurrences and not just for operational matters, both within different departments of PBC and with system participant, would certainly increase the PBC capacity to respond to unforeseen events.</p> <p>Over time, the PBC should strive to achieve full observance of the other CPs.</p>

Table 6. Central Bank Responsibilities in Applying the CPs

<i>Responsibility A – The central bank should define clearly its payment system objectives and should disclose publicly its role and major policies with respect to systemically important payment systems.</i>	
Description	<p>The main objectives and roles of the PBC in payment systems are clearly stated in the legislation. They are further elaborated through PBC bylaws and system rules and procedures.</p> <p>The legal basis for oversight by the PBC on interbank and government SSS are derived from the PBC Law. In particular, Article 4 of PBC Law provides that the PBC assumes the following functions “...issue the currency and administer its circulation; regulate and supervise the interbank lending market and interbank bond market; execute FX administration, regulate and supervise the interbank FX market; ensure normal operation of the payment and settlement systems.” Article 27 provides that “The PBC shall organize or assist in organizing a clearing system among banking financial institutions, coordinate clearing arrangements among them and provide settlement services. The detailed rules for such systems shall be formulated by the PBC. The PBC shall formulate rules on payment and settlement together with the banking regulatory authority under the State Council (SC).” Article 32 provides that the PBC shall have the power to inspect and supervise financial institutions, other organizations and individuals in their compliance with regulation of the inter-bank lending market and the inter-bank bond market, FX markets, and clearing and settlement.</p> <p>The PBC publicly discloses its role and responsibilities over payment and SSS:</p> <ul style="list-style-type: none"> • it regularly releases reports on the development of the national payments system of China; • it covers these aspects in the central bank annual report; • it holds press conferences and other public interventions by its leaders; • it uses the official central bank website and other media such as newspapers and magazines; and • finally, it publishes ad hoc official documents and research papers. <p>The PBC has played a major catalyst role in the reform of payment and settlement systems and in doing so has broadly consulted with system participants and the general public.</p> <p>A comprehensive document on payment system oversight covering in detail the public policy objectives of the PBC on payment system oversight, its instruments and institutional arrangements is not available both to major stakeholders in the payment system and the general public.</p> <p>Finally, it is not clear what are the criteria and analysis used by the PBC assess the systemic importance of payment systems in China.</p>
Assessment	Broadly Observed
Comments	<p>The PBC should clarify in detail its policy stance in payment system oversight in a publicly available document, which would expand on the scope of its actions and its plans to achieve its public policy objectives in payment system matters. With regard to policy objectives, the PBC might want to clarify that its oversight extends beyond the two traditional main objectives of efficiency and reliability of payment systems to a wider set of issues including the promotion of competition in the payment services market and the protection of consumer interests. With regard</p>

	<p>to the scope of its oversight role, the oversight policy document would explicitly state the PBC decision to apply its powers over all payments and SSS in the country. That is, over systemically important systems but also retail systems, since the latter are especially important in supporting economic activity, broad access to payment services and the public trust in money.</p> <p>The oversight policy document would also cover in detail the PBC major policies and instruments. Major policies would touch upon the main aspects of payment systems including, risk control, access, governance, transparency, pricing, system reliability and business continuity, efficiency, etc. Instruments would range from moral suasion to on-site inspections, from regulation to cooperation, from sanctions to the direct provision of payment services.</p> <p>Also, the oversight document should elaborate on the criteria used to determine when a system is systemically important. A list of these systems should be provided and constantly monitored and updated.</p> <p>Finally, the policy document would elaborate on institutional arrangements and cooperation in the payment system arena (see Responsibility D below).</p>
<i>Responsibility B – The central bank should ensure that the system it operates comply with the CPs.</i>	
Description	<p>With respect to oversight of HVPS and FCPS, the PBC has been applying the CPSIPS through pre-launch stages and post-launch stages to: design, build and, as appropriate, upgrade these systems; develop and refine policies and procedures related to these systems; and conduct periodic assessments to fully understand how payment systems are operating and providing services, and take actions to resolve identified risks.</p> <p>Yet, to date, the above systems do not fully observe all the CPSIPS.</p> <p>The PBC also operates the cheque clearing system, which is a combination of a national (cheque image) mechanism and a variety of local clearing systems. The volumes and values of cheques in China are significant, although are noted the vast majority of cheques is “on us.” Yet, the moving of all large value payments from the cheque clearing to the HVPS is still to be completed.</p> <p>To ensure effective oversight, the PBC has structured its organization to segregate oversight responsibilities from operation responsibilities with respect to payment systems.</p> <p>The roles of the Payment and Settlement Department and the Internal Audit Department in overseeing operations of payment systems are defined by POBC Office of Organizational Structure, Staffing Control and Position Review in its policy statements No. [2001]-11 and No. [2010]-7. The Payment and Settlement Department is responsible for “leading and coordinating the development of PBC-operated interbank payment systems, and formulating and implementing rules and procedures for administering systemically important payment systems.” The Internal Audit Department is responsible for “performing audits on PBC Head Office, PBC Shanghai Headquarters, PBC Branches (Regional Offices), enterprises and non-enterprise institutions directly governed by PBC and SAFE with respect to development, operations, internal controls of computer-based information systems as well as governance of system infrastructure and overall technology management.”</p>
Assessment	Broadly Observed
Comments	<p>The HVPS does not fully observe al CPSIPS and actions to achieve its full compliance should be completed by the PBC as a priority.</p> <p>A thorough evaluation of the risks associated with the cheque clearing and proactive actions</p>

	<p>to remove large value payment items from the cheque clearinghouse should be carried out as a matter of urgency.</p> <p>Some clarification of the roles of the Payment and Settlement Department and the internal audit department in the oversight of PBC operated payment systems might be necessary.</p>
<p><i>Responsibility C – The central bank should oversee observance with the CPs by system it does not operate and it should have the ability to carry out this oversight</i></p>	
Description	<p>As mandated by <i>The PBC Law and Methods for the Administration of Payment Services of Non-financial Institutions</i> (PBC Decree [2010]-2), PBC conducts son-site and off-site supervision for payment systems not operated by PBC; defines strict criteria for system operators and requires the latter to develop complete risk management measures and contingency plans and provide final settlement services.</p> <p>In particular, the PBC exercises oversight on the payment systems and services it does not operate or provide, such as Bankcard Interbank Payment System, intra-bank systems of banking institutions, Bank Draft Processing System for City Commercial Banks, the CFETS, and, more recently, third party payment service providers.</p> <p>The PBC ensures its ability to oversee such payment systems by establishing full-time oversight teams with appropriate skills and expertise; regularly convening consultative meetings with system operators, participants and other relevant stakeholders; conducting onsite examinations and periodic assessments.</p> <p>The PBC can also oversee these systems in its capacity as payment system operator and settlement provider for some of their clearing services (e.g., CUP).</p>
Assessment	Broadly Observed
Comments	The mission considers that a more proactive oversight by the PBC over the CFETS and the ACHs might be advisable. In particular, an assessment of the safety and efficiency of these systems with relevant international standards is recommended.
<p><i>Responsibility D – The central bank, in promoting payment system safety and efficiency through the CPs, should cooperate with other central banks and with any other relevant domestic or foreign authorities.</i></p>	
Description	<p>The PBC is the primary payment system overseer in China. However other authorities have oversight and supervisory responsibilities over some aspects of the payment and settlement systems.</p> <p>For example, the <i>Securities Law</i> (Article 179) gives the CSRC authority to perform the following functions and duties regarding the supervision and administration of the securities market:</p> <p>(1) Carrying out the supervision and administration of the issuance, listing, trading, registration, custody and settlement of securities.</p> <p>(2) Carrying out the supervision and administration of the securities activities of securities registrations and clearing institution.</p> <p>The Securities Law also provides that CSRC may perform on site inspections of securities registration and settlement institutions in accordance with law, conduct interrogations and inquiries of their workers and adopt measures including requesting corrective action, imposing fines, requiring shutdown or revoking securities service and business permits, etc., for actions in violation of the law.</p>

	<p>The PBC maintains effective coordination and information sharing with other financial regulators. For example, it builds information-sharing mechanisms and promote cooperation with such authorities as the National Development and Reform Commission (NDRC), MOF, National Audit Office (NAO), China Banking Regulatory Commission (CBRS) and China Insurance Regulatory Commission (CIRC); and it has an effective framework for working with China Banking Regulatory Commission (CBRC), CSRC, China Insurance Regulatory Commission (CIRC) and other financial regulators to ensure security and efficiency of the overall payment system.</p> <p>The PBC cooperation with relevant authorities in the area of payment and settlement is not structured through formal MoU or other pre-defined cooperative working mechanisms.¹⁵</p> <p>Regarding cooperation with stakeholders, no formal cooperative arrangement, such as a National Payments Council, is currently in place. The PBC, however, is currently working to create a national payment clearing association. As a nationwide self-regulatory organization for the payment service industry, the Association is intended to act as a self regulatory body of the payment service industry and promote the safe development of the payment systems in China.</p> <p>The PBC is increasingly strengthening its cooperation and exchanges of information with foreign central banks and regulatory authorities. It has signed Memoranda of Understanding or other agreements with a number of foreign authorities. The PBC is also a member of international cooperation organizations such as the CPSS and the Executives' Meeting of East Asia and Pacific Central Banks (EMEAP) at both the Governors' level and the Working Group on Payment and Settlement Systems (WGPSS). It also participates actively in the debate surrounding the international arena of payment and settlement systems, by attending seminars, conferences, courses, etc.</p> <p>Foreign currencies are transacted, cleared and settled in the Chinese domestic financial markets. This would require the activation of the CPSS cooperative cross-border oversight framework (see Box 2). However, it is not clear whether the framework has been followed consistently in all circumstances.</p>
Assessment	Broadly Observed
Comments	<p>The PBC should consider a further refinement of its cooperative framework at the domestic level, by activating and implementing Memoranda of understanding and a structured oversight working framework with all relevant authorities and creating the China National Payment Association.</p> <p>At the international level, the PBC is encouraged to continue its commendable effort of cooperation with relevant central banks and international organizations. A thorough application of the CPSS cross-border cooperative framework is also recommended. Several benefits would accrue to the PBC and the Chinese financial system of such enhanced cooperation. These include, for example, (1) the ability to tap into the</p>

¹⁵ However, the PBOC has invited the CSRC and other organizations to conduct joint reviews on securities clearing and settlement and in particular on the settlement of the cash-leg of securities transactions.

<p>knowledge, experience, and perspectives of the central banks of issue to support the PBC's analysis of the soundness of the settlement (and failure-to-settle) arrangements that involve their respective currencies; and (2) avoiding situations where the central banks of issue would have insufficient knowledge of a system in China and, hence, would not be in a position to be supportive of its use by institutions in their respective jurisdictions.</p>
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Box 2. CPSS – Principles for Co-operative Oversight of Payment and Settlement Systems

In May 2005, the Committee on Payment and Settlement Systems (CPSS), at the BIS published the “Central bank oversight of payments and settlement systems” report. This report identifies ten principles to guide central banks in their oversight activities, five of these principles specifically pertain to co-operative oversight. The five principles for co-operative oversight are relevant for oversight of payment and settlement system activities of transnational and multi-national payment system operators. The five principles for co-operative oversight identified in this report are listed below.

1. Cooperative Oversight Principle 1. Notification

Each central bank that has identified the actual or proposed operation of a cross-border or multi-currency payment or settlement system should inform other central banks that may have an interest in the prudent design and management of the system.

2. Cooperative Oversight Principle 2. Primary responsibility

Cross-border and multicurrency payment and settlement systems should be subject to oversight by a central bank which accepts primary responsibility for such oversight, and there should be a presumption that the central bank where the system is located will have this primary responsibility.

3. Cooperative Oversight Principle 3. Assessment of the System as a Whole

In its oversight of a system, the authority with primary responsibility should periodically assess the design and operation of the system as a whole. In doing so it should consult with other relevant authorities.

4. Cooperative Oversight Principle 4. Settlement Arrangements

The determination of the adequacy of a system’s settlement and failure-to-settle procedures in a currency should be the joint responsibility of the central bank of issue and the authority with primary responsibility for oversight of the system.

5. Cooperative Oversight Principle 5. Unsound Systems

In the absence of confidence in the soundness of the design or management of any cross-border or multicurrency payment or settlement system, a central bank should, if necessary, discourage use of the system or the provision of services to the system, for example by identifying these activities as unsafe and unsound practices.

**Table 7. Summary observance of CPSS Core Principles and Central Bank Responsibilities
China HVPS and Central Bank Responsibilities**

<i>Assessment grade</i>	<i>Principles grouped by assessment grade</i>	
	Count	List
Observed	6	Core Principles II,III,IV,VI,VII,IX
Broadly observed	2 + 4	Core Principle VIII and X, Central Bank responsibilities A, B, C, D
Partially observed	1	Core Principles I
Non-observed	-	-
Not applicable	1	Core Principle V

Table 8. Recommended Actions to Improve Observance of CPSS Core Principles and Central Bank Responsibilities in Applying the CPs China HVPS

<i>Reference Principle</i>	<i>Recommended Actions</i>
<p>Legal foundation <i>CP 1</i></p>	<p>Chinese authorities should accelerate the legislative process to complete the reform of the legal and regulatory framework for payment and securities settlement. This will include:</p> <ul style="list-style-type: none"> • The enactment of a payment system law to give full legal protection, among other things, to settlement finality and netting arrangements. • The introduction of the Interpretation of Enterprise Bankruptcy Law or revision of the Enterprise Bankruptcy Law to exempt the payment system sector from the “zero-hour rule.” • The upgrade of payment system rules and procedures to the level of PBC regulation.
<p>Understanding and management of risks <i>CPs 2 and 3</i></p>	<p>As it is not clear whether participants are fully aware of the potential legal risk associated with settlement finality, the PBC might want to inform participants about the measures it took to mitigate this risk and the projects under way to eliminate it.</p> <p>The PBC should further monitor the credit risk and liquidity risk of the system by improving relevant rules and building the second-generation payment system. Relevant actions mainly include:</p> <ul style="list-style-type: none"> • Provide participants with more comprehensive queuing and account monitoring functions, “package” liquidity real-time inquiry functions and large-value payment system queuing matching. • Apply more active mark-to-market mechanisms for the collateral used in the intra-day liquidity facility. • As liquidity conditions evolve, maintain flexibility in the conditions applied to intra-day liquidity facilities and consider the removal of charging for collateralized credit.
<p>Settlement <i>CPs 4, 5, and 6</i></p>	<p>-</p>
<p>Security and Operational Reliability, and Contingency Arrangements <i>CP 7</i></p>	<p>The second-generation payment system will have a more efficient operation and maintenance mechanism, which realizes automatic upgrading of the system application software; it will further:</p> <ul style="list-style-type: none"> • improve the real-time operation monitoring function, which carries out comprehensive and automatic monitoring of the IT resources of the payment system;

Reference Principle	Recommended Actions
	<ul style="list-style-type: none"> • improve the risk warning capability, effectively analyzing the potential risks of the system and giving timely warning; • realize automatic handling of system failures to the maximum degree; and • reduce the system maintenance work load, increasing the operation monitoring efficiency and upgrading the operation maintenance level. <p>The second-generation payment system will provide the backup system with enhanced features, such as a complete production recovery capability, business switching capability and data searching capability on the framework of the production center, remote backup center and the data backup center in the same city to ensure the continuous processing of payment and the security and integrity of information and data in case of emergency.</p> <p>The above measures are strongly encouraged.</p>
Efficiency and Practicality of the System <i>CP 8</i>	<p>Notwithstanding the important progresses achieved since the launch of the CNAPS, some features might be adjusted to increase efficiency and practicality to the users, such as:</p> <ol style="list-style-type: none"> 1) The “multiple access point” feature of the system might impact the efficient management of liquidity and adds to the cost of participating in it. 2) High value electronic transactions might still be perceived as relatively more expensive vis-à-vis large value cheque transactions, although it is noted that commercial banks are gradually switching their customers to other electronic payment options. 3) Operating hours could be extended to reflect the growing importance of the system.
Criteria for Participation <i>CP 9</i>	<p>To further strengthen supervision and management of the payment system participants and guarantee the secure and stable operation of the payment system, PBC plans to revise the <i>Administrative Measures for Accessing to and Exiting the Payment System by Banking Financial Institutions</i>. For instance, it plans to specify and detail the mode for examining the access applicants in the Administrative Measures:</p> <ul style="list-style-type: none"> • testing relevant personnel on knowledge about the payment systems; • onsite check of the payment settlement processing environment; and • calling the top management together for prudent talks so as to increase the operability of access review and approval.

<i>Reference Principle</i>	<i>Recommended Actions</i>
	These measures are strongly encouraged.
<p>Governance of the Payment System <i>CP 10</i></p>	<p>As mentioned, the PBC is already addressing most of the existing shortfalls of the system and should be commended for the extraordinary effort to launch and operate a sophisticated and reliable payment system, which constitutes the backbone of China's financial system.</p> <p>Involving more and more system participants in the 'second generation' project and, eventually creating a formal users' group will facilitate cooperation and foster the systems' performance over time.</p> <p>Also, the regular rehearsal of crisis procedures for all types of emergency occurrences and not just for operational matters, both within different departments of PBC and with system participant, would certainly increase the PBC capacity to respond to unforeseen events.</p> <p>Over time, the PBC should strive to achieve full observance of the other CPs.</p>
<p>Central Bank Responsibilities in Applying the CPs <i>Central Bank Responsibility A, B, C, and D</i></p>	<p>The PBC should clarify in detail its policy stance in payment system oversight in a publicly available document, which would expand on the scope of its actions and its plans to achieve its public policy objectives in payment system matters. With regard to policy objectives, the PBC might want to clarify that its oversight extends beyond the two traditional main objectives of efficiency and reliability of payment systems to a wider set of issues including the promotion of competition in the payment services market and the protection of consumer interests. With regard to the scope of its oversight role, the oversight policy document would explicitly state the PBC decision to apply its powers over all payments and SSS in the country those that are systemically important and retail systems, since the latter are especially important in supporting economic activity, broad access to payment services and the public trust in money.</p> <p>The oversight policy document should also cover in detail the PBC major policies and instruments. Major policies would touch upon the main aspects of payment systems including, risk control, access, governance, transparency, pricing, system reliability and business continuity, efficiency, etc. Instruments would range from moral suasion to on-site inspections, from regulation to cooperation, from sanctions to the direct provision of payment services.</p> <p>Also, the oversight document should elaborate on the criteria used to</p>

<i>Reference Principle</i>	<i>Recommended Actions</i>
	<p>determine when a system is systemically important. A list of these systems should be provided and constantly monitored and updated.</p> <p>Finally, the policy document would elaborate on institutional arrangements and cooperation in the payment system arena (see Responsibility D below).</p> <p>The HVPS does not fully observe all CPSIPS and actions to achieve its full compliance should be completed by the PBC as a priority.</p> <p>A thorough evaluation of the risks associated with the cheque clearing and proactive actions to remove large value payment items from the cheque clearinghouse should be carried out as a matter of urgency.</p> <p>Some clarification of the roles of the Payment and Settlement Department and the internal audit department in the oversight of PBC operated payment systems might be necessary.</p> <p>The mission considers that a more proactive oversight by the PBC over the CFETS and the ACHs might be advisable. In particular, an assessment of the safety and efficiency of these systems with relevant international standards is recommended.</p> <p>The PBC should consider a further refinement of its cooperative framework at the domestic level, by activating and implementing Memoranda of Understanding on payment and settlement issues and a structured oversight working framework with all relevant authorities and creating the China National Payment Association.</p> <p>At the international level, the PBC is encouraged to continue its commendable effort of cooperation with relevant central banks and international organizations.</p> <p>A thorough application of the CPSS cross-border cooperative framework is also recommended.</p>

V. AUTHORITIES' RESPONSE

The Chinese authorities welcome and support the CPSS assessment as an opportunity for reflection and improvement for China payment and settlement system according to international standards. The assessment team has undertaken an excellent task, demonstrating high quality, professionalism, dedication and the ability to cut through complex issues in a constrained timeframe. The authorities appreciate the opportunity to provide the following comments.

Over the past decade, China has continuously pushed forward the development of China payment and settlement system, which constitute the backbone of China's financial system. We have built a payment network consisting of the central bank inter-bank payment systems, the banking institutions' internal payment system, the security settlement system, the FX settlement system, the bankcards payment system and other retail payment systems run by private sectors. Non-cash payment instruments have been widely used and met various payment requirements. Commercial drafts have been underwritten and transferred in an electronic way. Bankcards penetration ratio has been on a fast track and bankcards have been the most widely used payment instrument by Chinese residents. Online payment, mobile payment and telephone payment have been developing dramatically. The application of non-cash payment instruments has greatly facilitated economic production and civil life, reduced cash circulation and transaction costs. Payment providers have been diversified. These include the central bank, banking institutions, nonbanking institutions and securities settlement institutions as payment organizations. The payment services have been market-driven. Modern payment means have also found their way in rural areas. The pilot cross-border trade settlement in RMB has developed in an orderly way. The management system of bank settlement accounts has improved on a gradual basis. The PBC has promulgated regulations on bank settlement accounts and established the bank settlement account management system to implement regulations. At the same time, the PBC launched a nationwide identity authentication system of accounts with the Police Bureau to implement the "know your customer" scheme. The payment system oversight has been strengthened, with safety and efficiency as the priority. The PBC has also improved supervision techniques and realized the DVP mode in the bond market.

The Large Value Payment System (LVPS) run by the PBC has been designated as the systemically important payment system and has been assessed against the CPs. The assessment concluded that the system observes (observed or broadly observed) all the CPs except CPI (legal basis). The PBC pays high attentions to the assessment results and appreciates valuable recommendations of the IMF and the WB. In implementing the recommendations, the PBC has realized one point entry in CNAPS1, e.g., the treasury centralized booking system and China postal savings bank's internal payment system have been connected to CNAPS1 from one point and settled their transactions with one account.

Measures will be taken to strengthen our legal foundation, management and supervision of China payment systems, so as to improve its practicality and efficiency in the future.

1. *CP I legal Foundation.* The PBC has been aware of the shortcomings in the legal framework, and has decided to draft a payment system act to avoid the effects of the “zero hour rule” and give the legal recognition of netting arrangements and settlement finality. But the process of establishing legislation will take time and may involve many authorities.
2. *CP VIII Practicality and Efficiency.* The PBC is launching the 2nd generation of CNAPS to increase efficiency and practicality. CNAPS2 will be designed to extend the opening hours of settlement to meet the needs of users in different areas and various financial markets.
3. *CP X Governance.* The PBC has decided to improve management, upgrade the payment system and conduct a regular drill of emergency procedures, with an aim to achieving full observance of the CPs.

Central Bank Responsibilities A, B, C and D. The PBC fully agrees with the recommendations and will take proper measures to ensure full observances of all CPs. The PBC will clarify in detail its policy stance in the payment system oversight in a publicly available document, and extend its oversight over all payments and securities settlement systems, including the systemically important systems and retail payment systems. The PBC will assess the safety and efficiency of the CFETS and the ACHs with relevant international standards. Besides, the PBC is about to establish the China National Payment Association and strengthen cooperation with relevant authorities, foreign central banks and international organizations.

APPENDIX I: SELF-ASSESSMENT OF CHINA DOMESTIC FOREIGN CURRENCY PAYMENT SYSTEM (FCPS)

The PBC conducted a self assessment of the FCPS, which was provided to the FSAP team. The main features are summarized below.

- **Legal and Regulatory Framework**

The general legal framework applicable to the FCPS is described in the HVPS assessment. Rules and procedures for the FCPS include, among other things: *Administrative Procedures for Domestic Foreign Currency Payment System, Procedures for the Administration of Settlement agents in Domestic Foreign Currency Payment System, Operation Procedures for Domestic Foreign Currency Payment System, Operational Procedures for Domestic Foreign Currency Payment System, Contingency Plan for Domestic Foreign Currency Payment System, and Circular of The PBC concerning Matters to Transaction Processing in Domestic Foreign Currency Payment System* (PBC Doc [2008]-387).

- **Management of Financial Risks**

Credit Risk. Article 10 of the Administrative Procedures for the FCPS stipulates that the system “processes payment instructions individually in real-time and settles each payment to its full value. Any payment sent by a participant or specially authorized participant shall become final upon settlement.” Article 51 stipulates that the system “shall calculate available quotas by currency for all participants in real time as a way to safeguard against credit risk.”

Liquidity Risk. Article 53 of the Administrative Procedures states that “Participants shall maintain sufficient available quotas at Foreign Currency Clearing Processing Center (FCCPC) to ensure that foreign currency payments are timely cleared.” Article 54 stipulates that “Upon being informed by FCCPC that their payments have been placed in a queue for settlement, specially authorized participants shall timely notify and urge relevant participants to raise funds. In the event that any relevant participant fails to raise sufficient funds before the Settlement Window is closed, specially authorized participants shall ensure foreign currency payments are timely settled in the system by accessing risk deposit and risk-sharing mechanism.” Article 55 stipulates that “Settlement agents shall provide participants with liquidity support such as overdraft facilities and pledge financing as a way to safeguard against liquidity risk.”

- **Settlement**

As a RTGS system, the FCPS settles payment instructions denominated in each of the currencies in real time upon receipt of such payment instructions from any participant provided that such participant has sufficient available quotas.

- **Settlement Asset**

Commercial bank currency is used by the FCPS for settlement, which means that participants use the foreign currency inter-bank deposit they maintain with settlement agents to complete settlement. Currently, major settlement agents designated by the FCPS are: Industrial and Commercial Bank of China (Euro & Japanese Yen), BOC (U.S. Dollar), CCB (Hong Kong Dollar), Shanghai Pudong Development Bank (Pound Sterling, Australia Dollar, Canadian Dollar & Swiss Franc).

While the FCPS uses commercial bank money as its settlement asset, it employs mechanisms for settlement agent selection, system oversight and governance, settlement assets conversion and other areas, which address the credit and liquidity risk of the settlement assets. They include: First, the *Administrative Procedures for settlement agents in Domestic Foreign Currency Payment System* calls for the settlement agents to be financially robust and carry no or little liquidity risk. For example, Article 13 stipulates that “a bank may apply for status of a settlement agent for a certain foreign currency when: (I) It is a corporate domestically registered for more than 10 years; (II) It has all licenses necessary for a FX service provider and has appropriate capacity for providing FX services; (III) It is operationally and financially healthy with strong ability to raise funds in foreign currencies; (IV) It owns an appropriate number of domestic branches and an appropriate number of overseas branches or a complete international network of correspondent banks; (V) It has an appropriate number of managers and operators that are familiar with foreign currency payment services and foreign currency payment system; (VI) It has safe and efficient internal operational systems; and (VII) It has a sound governance program for controlling its foreign currency settlement services.” Second, the portfolio of settlement agents should be capable of ensuring that settlement assets be liquid and maintained at a high credit rating level. Third, the PBC monitors and keeps track of the liquidity and credit rating levels of the settlement agents.

- **Operational Reliability and Business Continuity**

The FCPS meets the security policies and operational service levels agreed by the system operator and participants. In particular, a portfolio of business procedures and technical safeguards have been implemented to ensure security and reliability with a 99.9 percent of system operational reliability and a recovery time objective of 120 minutes.

Security: Security policies for the FCPS conform to the security standards centrally set for China's banking industry. The system is mandated to attach digital signatures to payment transaction information and establish a process for verifying digital signatures. So, the system is capable of ensuring integrity, authentication and non-reputability of payment instructions. Primary backbone communications lines are protected by IP encryption to ensure confidentiality of data throughout the transmission over backbone networks. The PBC periodically conducts security tests and assessments of FCPS.

Operational reliability: The FCPS has been built with full account given to computer and network redundancy by installing hot backup systems at FCCPC, shared member bank front ends (MBFEs) and settlement banks to avoid single-point failures; regarding network communications, backup communications lines are also deployed. In preparation for infrastructure failures and natural disasters, The PBC has built offsite backup centers for the FCCPC and shared MBFEs for switching production to backup centers in the event of emergencies.

Performance tests show that the FCCPC is capable of processing 70,000 payments per hour, meeting operational requirements and being sufficient for supporting actual workloads.

Business continuity: In late August 2009, the NPC successfully implemented emergency drills of the payment settlement system (including domestic foreign currency payment system). The system switched over to the emergency center and operated for a week under emergency scenarios, thus demonstrating the validity of the business continuity plan.

Real time backup technology for business data is used between the disaster backup center of the FCCPC and the shared front end processors and the operating center. There is a one minute lag time between the business data of the disaster backup center and the business data of the operating center. The distance between the backup center and the main station is greater than 500 km and it uses communications and power lines that are different from those of the operating center.

- **Pricing**

Currently, the FCCPC uses the method of cost covering pricing and the settlement agents use the method of market pricing. Based on the existing pricing, when participants process each transaction, the maximum cost they pay to the FCCPC and settlement agents is 16 Yuan to 26 Yuan, depending on the currency, whereas before the FCPS was launched, the cost for a bank that used a correspondent bank as the agent bank for foreign currency settlement in China was about 35 Yuan to 140 Yuan. Therefore, the construction of the FCPS has lowered the cost of banking institutions in processing foreign currency payments and increased the competitiveness of banking institutions.

- **Access Criteria**

Article 18 of *Administrative Procedures for the FCPS* stipulates that: “A bank that joins the foreign currency payment system as a direct participant should meet the following conditions: (One) Have qualifications as a financial entity in China; (Two) Have qualifications as approved by the banking supervision and management authority of the SCI for processing the relevant foreign currency business; (Three) Have an appropriate number of management and operations personnel familiar with the foreign currency payment business and foreign currency payment system; (Four) Meet the applicable technical and security requirements for joining the foreign currency payment system; (Five) Have a sound internal management system related to the foreign

currency payment system; (Six) Have an effective and feasible plan for preventing and eliminating foreign currency payment risks.”

Article 19 stipulates that “A foreign currency settlement institution that joins the foreign currency payment system as a specially designated participant should meet the following conditions: (One) Have qualifications as approved by competent state authorities to process foreign currency settlements; (Two) Meet the applicable technical and security requirements for joining the foreign currency payment system; (Three) Have a sound internal management system related to the foreign currency payment system; (Four) All of its members are participants in the foreign currency payment system or may authorize participants in the foreign currency payment system to perform settlements; (Five) Have a sound risk bond system and have signed a risk sharing agreement with all members; and (Six) Have an effective and feasible plan for preventing and eliminating foreign currency payment risks.”

- **Exit Criteria**

Article 68 of Administrative Procedures for the FCPS stipulates that “In the event that a participant engages in any of the actions below, the PBC may, depending on the circumstances and impact, publicly circulate information thereon, suspend its foreign currency payment system business and order it to withdraw from the foreign currency payment system. (One) Provides false application materials and join the foreign currency payment system by deceptive means; (Two) Processes transactions through the foreign currency payment system that do not comply with state policies and regulations related to foreign currency control; (Three) Fails to verify and reply or fails to verify and reply in a timely manner after receipt of an inquiry; (Four) Fails to process a foreign currency refund after receipt of an application for a foreign currency refund in accordance with the applicable provisions; (Five) The available limit is insufficient, causing the foreign currency payment system to repeatedly open the settlement window; (Six) Has major a risk hazard that affects the secure and stable operations of the foreign currency payment system; and (Seven) After the occurrence of a foreign currency payment system failure or unexpected incident, fails to report same according to the applicable provisions or fails to actively take effective measures, thus affecting the secure and stable operations of the foreign currency payment system.”

Article 69 stipulates that “In the event that a specially designated participant engages in any of the actions below, the PBC may, depending on the circumstance and impact, publicly circulate information thereon, suspend its foreign currency payment system business and order it to withdraw from the foreign currency payment system: (One) Provides false application materials and join the foreign currency payment system by deceptive means; (Two) Processes transactions through the foreign currency payment system that do not comply with state policies and regulations related to foreign currency control; (Three) Fails to perform risk control over the net offset balance business launched thereby, causing the foreign currency payment system not to be able to settle normally at the end of the day; (Four) Has major a risk hazard that affects the

secure and stable operations of the foreign currency payment system; and (Five) After the occurrence of a foreign currency payment system failure or unexpected incident, fails to report same according to the applicable provisions or fails to actively take effective measures, thus affecting the secure and stable operations of the foreign currency payment system.”

Article 71 stipulates that *“Participants and specially designated participants that have been ordered by the PBC to withdraw from the foreign currency payment system shall not apply for joining the foreign currency payment system for a period of 2 years from the date of withdrawal. A bank whose qualifications as settlement agents for a certain currency have been terminated early by the PBC shall not apply for becoming a settlement agent for such a currency for a period of 2 years from the date of termination of such qualifications.”*

Article 72 stipulates that *“In the event that participants, specially designated participants, settlement agents and the FCCPC fail to process foreign currency payment business in accordance with the applicable provisions, thus causing any fund loss, they shall undertake the liability for damages in accordance with law; should such failure constitute a crime, criminal liability shall be pursued in accordance with law.”*

Voluntary withdrawal from the system: Article 30 of *Administrative Procedures for the FCPS* stipulates that: *“In the event that a participant and specially designated participant needs to withdraw from the foreign currency payment system, it shall submit a written application to the PBC in accordance with provisions of Article 20 of these methods, where the participant should revoke all of the information related to its sending or receiving bank number in advance through the foreign currency payment system. For a participant and specially designated participant that meet the conditions for withdrawal, the head office of PBC shall determine the effective date of its withdrawal from the foreign currency payment system and shall make same public through the foreign currency payment system.”*

- **Governance Arrangements**

Major decisions affecting the FCPS are all made after the opinions of the relevant parties are sought and after careful consideration. For example, during the designs and construction of the system, the PBC sought the opinions of policy banks, state owned commercial banks and nationwide commercial banks on major issues, such as whether to set up the systems, the ownership structure, system framework and business scope, etc. Some of the more relevant governance arrangements are as follows:

- (1) The core system of the FCPS includes the FCCPC and settlement agents, where the FCCPC is operated by the PBC NPC. As a public institution under the *aegis* of the PBC, the NPC is a non-profit organization.

- (2) The NPC and the settlement agents have, in strict compliance with the applicable regulations and provisions of the FCPS, provided professional knowledge training for the relevant management personnel, business supervisors, technical support personnel and operations personnel, etc., of FCPS. They have the skills necessary for achieving the goal of the system and can take responsibilities for system operations.
- (3) Ownership information of the FCPS is publicly available. Information on management structure is issued in the form of official documents to settlement agents and all participants. The appointment procedures of senior management personnel are publicly available.
- (4) The Crisis Response Plan for the FCPS provides a detailed explanation of decision and notification procedures and timetables for handling abnormal situations.

No formal users' group is established for participants to provide regular feedback on systems' operation. Participants are also not fully aware so far of the details of the "second generation" project. However, the PBC organizes meetings and workshops on a regular basis with payment system stakeholders.